



Appendices

13th Avenue Corridor Study

West Fargo, North Dakota
February 1, 2019

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Appendix A – Public Input Documentation

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Minutes

Project:	FM Metro COG: 13 th Avenue Corridor Study – Main Avenue to 17 th Street E
Subject:	Project Kick Off Meeting
Date:	Friday, September 08, 2017
Location:	West Fargo City Hall

1. Introductions / Project Team

- a. Confirm distribution list for agenda, meeting minutes, etc.

Add MnDOT, NDDOT, FTA & FHWA to SRC List

Add West Fargo Park District and School District to SRC List

2. Deliverables

Discussed extending study north of Main Ave along 15th Street

Potentially Phase II or Later Study

- a. Technical Memorandums

- i. Scenario Development
- ii. Existing Conditions
- iii. 2040 Traffic Forecast
- iv. Existing/No-Build Traffic Operations
- v. Issues & Needs
- vi. Alternative Impact Analysis

- b. Draft & Final Public Participation Plan

- c. Purpose and Need Statement

- d. Draft & Final Report

3. Schedule

- a. NTP – 8/10/2017

- b. SRC Meetings

- i. #1 – Early October 2017 (Scenario Development Workshop)
- ii. #2 – Early January 2018
- iii. #3 – Late February 2018

- c. Public Meetings

- i. WestFest September 2017
- ii. Late February 2018

Online Public Meeting

Developer Pop-Up Meeting

- d. Draft Report – ~~4/2017~~ 4/2018

- e. Final Report – ~~5/2017~~ 5/2018

4. Project Scope Discussion

- a. Data Gathering & Collection

- i. Previous Studies & On-Going Studies

- 1. Sheyenne Street Corridor Study – Phase I & II
- 2. West Fargo Comprehensive Plan

3. 9th Street/Veteran's Blvd Corridor Study
4. Metro 2040 Final Report
West Fargo 2.0 – West Fargo to bring relevant info to SRC Meeting #1 (Scenario Development Workshop)
- ii. Data Files
 1. Metro COG Travel Demand Model –HDR to request from ATAC
 2. 13th Avenue Operational Conditions Index –HDR to request from City of West Fargo and Cass County Highway
- iii. Traffic Data
With construction on corridor counts done now will be skewed
 1. Average Annual Daily Traffic Counts
 2. Turning Movement Counts – HDR to request from City (Completed Spring of 2016)
 3. Traffic Signal Timings –HDR to request from City
Signals along corridor have interconnect
 4. Crash Data (last 5 years) –Request from NDDOT through the City
- iv. Other Items
 1. GIS Files –HDR will compile list to request data from City / County
 2. As-Built Plans –HDR to request from City / County
- b. Project Development and Planning
 - i. Discuss Purpose & Need – Develop a draft early on and will revisit after Issues and Needs Assessment
 - ii. Scenario Development Workshop
Once date is set Tim will book the West Fargo City Hall Training Room
 1. Identify stakeholders
SRC, Commissioner Simmons
 2. Identify potential dates
1st or 3rd Week of October
Brian to send out poll to find date
 3. Discuss data needs
Travel Demand Model / Social Economic Data
Assumes FM Area Diversion is built
- c. Public Participation
West Fargo would like to see the numbers
Geographical area covered
Neighborhood surveyed lives in
How long have they lived in West Fargo
 - i. Discuss Public Participation Plan
This will be a living document
 - ii. Discuss WestFest

Will have a tent with survey and “kids zone”
Push cart

5. Other Items

Website

West Fargo in the process of updating City’s website

HDR – Flint to develop project website

Either link or embed in City’s website

6. Adjourn

Action Items

Action Item	Responsible Party	Due Date
West Fargo Neighborhood List	Melissa Richard	9/11/17 EOB
Draft Questionnaire Comments	SRC	9/11/17 EOB
List of GIS / As Built Needs	Matthew Huettl	9/12/17
SRC #1 Poll for Date	Brian Ray	9/15/17

Minutes

Project: FM Metro COG: 13th Avenue Corridor Study – Main Avenue to 17th Street E

Subject: Scenario Development Workshop

Date: Wednesday, October 18, 2017

Time: 1:00 PM – ~~4:30 PM~~ 3:30 PM

Location: West Fargo City Hall – Training Room

1. Welcome/Introductions
 - a. See attached Sign-in Sheet
2. Project Status Update
 - a. Matthew gave a brief project status update
 - i. Outstanding Data
 1. Pavement Condition Index – Chris working on providing
 2. Crash Data – Request Being Drafted to NDDOT
 - b. Melissa (Flint) gave brief recap on WestFest Efforts and Results
3. Discuss Scenario Development Workshop Objectives
 - a. Brian gave an overview of the workshop and what the goals were
 - b. General Discussion on assumptions
 - i. FM Diversion In vs. Out
 - ii. 2045 Demographic Data
4. Discuss Land Use Scenarios
 - a. Review 2045 Socio-Economic Data
 - i. Brian discussed current and 2045 travel analysis zone (TAZ) data
 - b. Brainstorm Potential Land Development Scenarios
 - i. Between FM Diversion & I94
 1. Town Center location from West Fargo 2.0
 2. Mixed use
 3. Employment Type and Household Numbers
 - a. Coordinate with City Planning to determine practical numbers
 - ii. Fairground Annex
 1. 84,000 sf Convention Center with attached hotel
 - a. 40 Acres of initial development
 2. Potential for 150-200 acres to be sold and developed
 - a. Southern End of RRVF Property
 - b. Commercial Development
 - c. More jobs created than households built
 - iii. North of Main Avenue – Industrial Development
 1. Current Data shows growth of 1700 Jobs in area
 - c. Identify up to 3 Feasible Land Use Scenarios
 - d. Define each Land Use Scenario

- i. L1 – SW I-94 Town Center Growth Area
- ii. L2 – Fair Grounds Annexation Development
- iii. L3 – Combine L1 with L2
- iv. LB – Baseline

5. Discuss Transportation Scenarios

a. Brainstorm Potential Transportation Scenarios

- i. 13th Ave Overpass over I-94
 - 1. Which street would become through movement?
 - 2. Concerns of higher traffic volumes around Elmwood Park expressed
 - 3. Potentially slight positive impact to soccer complex traffic
- ii. Extend 15th St / CR28 north of Main Avenue to 19th Avenue N
- iii. Sheyenne Street Improvements
 - 1. Would this change traffic on 13th Ave?

b. Identify up to 3 Feasible Transportation Scenarios

c. Define each Transportation Scenario

- i. T1 – I-94 Overpass
- ii. T2 – 15th St / CR28 Extension
- iii. T3 – Combine T1 with T2
- iv. TB – Baseline

6. Identify Combinations of Land Use/Transportation Scenarios

	T1	T2	T3	TB
L1	✓		✓	
L2		✓	✓	✓
L3	✓		✓	
LB		✓		✓

7. Next Steps

- a. Coordinate needed data
- b. Run models and analyze
- c. Develop scenario development tech memo

8. Adjourn

Action Items

Action Item	Responsible Party	Due Date
Obtain Southwest / Sheyenne Study Travel Demand Model	Brian / Michael	
Coordinate feasible input data for growth areas	Brian / WF Planning	

Sign-In Sheet

Project: FM Metro COG: 13th Avenue Corridor Study – Main Avenue to 17th Street E

Subject: Scenario Development Workshop

Date: Wednesday, October 18, 2017

Time: 1:00 PM – 4:30 PM

Location: West Fargo City Hall – Training Room

NAME	AGENCY	EMAIL
Matthew Stanness	Cass Co. Hwy. Dept.	stannessm@casscountyncd.gov
Larry Weil	City Planning	larry.weil@westfargond.gov
Barb Erbspesser	WF Park District	barb@wparks.org
Bradley Redmond	WF Public Schools	redmond@westfargo.k12.nd.us
Dustin Scott	Moore Engineering	dscott@mooreengineeringinc.com
Michael Maddox	Metro COG	maddox@fmmetro.org
Heith Janke	WF Police Dept.	heith.janke@westfargond.gov
Amy Acquard	Flint Group	amy.acquard@flint-group.com
Chris L Hagen	Flint Group	chris.hagen@flint-group.com
Melissa Reichert	Flint Group	melissa.reichert@flint-group.com
Melissa Richard	City of West Fargo Comm	melissa.richard@westfargond.gov
Tina Fiske	City of WF	tina.fiske@westfargond.gov

Sign-In Sheet

Project: FM Metro COG: 13th Avenue Corridor Study – Main Avenue to 17th Street E

Subject: Scenario Development Workshop

Date: Wednesday, October 18, 2017

Time: 1:00 PM – 4:30 PM

Location: West Fargo City Hall – Training Room

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hdrinc.com 51 N. Broadway, Suite 550, Fargo, ND 58102-4970
(701) 353-6100

Minutes

Project:	FM Metro COG: 13 th Avenue Corridor Study – Main Avenue to 17 th Street E
Subject:	Scenario Development Land Use – Web Meeting
Date:	Wednesday, November 15, 2017
Location:	Web Meeting
Attendees:	Tim Solberg (City of West Fargo) Dan Farnsworth (FM COG) Jason Carbee (HDR) Brian Ray (HDR) Matt Huettl (HDR)

1. Introductions

2. Discuss Land Use Options SW I-94 Town Center

a. Review various town centers

- **New Town – St Charles, Mo**
<https://www.google.com/maps/@38.8323072,-90.5002652,3928m/data=!3m1!1e3?hl=en>
- **Fallbrook – Lincoln, NE** <https://www.google.com/maps/@40.8801494,-96.7269717,1597m/data=!3m1!1e3?hl=en>
- **Somerset – Ames, IA** <https://www.google.com/maps/@42.049628,-93.6459688,1414m/data=!3m1!1e3?hl=en>
- **Village Gardens – Lincoln, NE**
<https://www.google.com/maps/@40.7381648,-96.6415596,655m/data=!3m1!1e3?hl=en>
- **Aksarben Village – Omaha, NE**
<https://www.google.com/maps/@41.2401161,-96.0157362,1102m/data=!3m1!1e3?hl=en>
- **West Glen – West Des Moines, IA** <https://www.google.com/maps/@41.5620946,-93.7830214,880m/data=!3m1!1e3?hl=en>
- **Peninsula Neighborhood – Iowa City, IA** (mostly neo traditional residential) <https://www.google.com/maps/@41.676163,-91.5567703,536m/data=!3m1!1e3?hl=en>
- **Park Place - Leawood, KS** - <https://www.google.com/maps/@38.9180166,-94.6469314,762m/data=!3m1!1e3>

b. Identify appropriate land use mix (residential, office, retail)

- The town center development should focus on housing
- It will be more boutique/service type retail, not regional retail
- It will be designed to be a self-sustaining community
- Housing will be more dense at the core
- Potential for an elementary school

c. Amount of land to be developed

- During the planning horizon (next 20-25) years the town center would be developed with this scenario, but there would still be quite of bit of undeveloped land in this area.
- The increase in socio-economic data in this zone would be offset by reductions in other zones throughout the region.

3. Next Steps

- HDR will develop the proposed TAZ socio-economic changes for this scenario and send them to FM COG for their review.
- FM COG will coordinate to determine the appropriate model and socio-economic data to use for this analysis.

4. Other Items

Action Items

Action Item	Responsible Party	Due Date
Develop proposed TAZ socio-economic changes for this scenario and submit to FM COG for review	Brian / Jason	
Coordinate with ATAC to determine appropriate model and socio-economic data to use.	Dan	

Minutes

Project:	FM Metro COG: 13 th Avenue Corridor Study – Main Avenue to 17 th Street E
Subject:	Scenario Development Tech. Memo Discussion
Date:	Thursday, July 19, 2018
Time:	9:00 AM – 9:45 AM
Location:	Conference Call

Attendees:

Brian Ray – HDR	Dan Farnsworth – Metro COG	Tina Fisk – WF Admin.
Jason Carbee – HDR	Larry Weil – WF Planning	Melissa Richard – WF Comm.
Matthew Huettl – HDR	Tim Solberg – WF Planning	Matt Marshall – WF Econ. Dev.

Discussion:

- Brian R. discussed the Land Development scenarios
 - Town Center SW of I-94
 - RRVF Grounds redevelopment
- Brian R. discussed the potential transportation scenarios
 - 13th Ave Overpass over I-94
 - Extension of 15th St to the North
- Brian R. discussed the model (traffic volumes) output
 - Seeing increases with adding scenarios in traffic west of Sheyenne
 - East of Sheyenne is not seeing significant increases in volumes
 - With new developments 13th Ave is not carrying longer trips
 - These are getting rerouted to other routes
- Further intersection analysis will need to be performed
- Dan F. had no questions
 - Decision from West Fargo on which scenario to move forward with
- Tim S. stated the WF Comp. plan shows both scenarios
 - Suggested moving forward as both LD as the scenario
- Matt M. discussed the RRVF Grounds Development
 - Normal fair does not have a constant traffic flow (high peaks, low valleys)
 - If developed into commercial this would increase constant traffic flow
- Brian R. & Jason C. discussed assumptions for the RRVF Grounds developments used in the modeling.
- Tim S. asked Dan F. if he was comfortable with making the assumptions.
 - Dan F. comfortable with Town Center
 - Comfortable moving forward with assumptions and utilizing combination of TC & RRVF Grounds Development
- Tim S. asked if L2 needs to be tweaked in the language
 - Brian R. suggested to include text to state that this is one scenario and is used as a place holder for similar development scenarios that would produce similar traffic volumes

Decision:

Move forward with L3 / T3 Scenario

Action Items:

Action Item	Responsible Party	Due Date
Update Technical Memorandum wording for L2	HDR	
Begin detailed analysis of corridor	HDR	

Minutes

Project: FM Metro COG: 13th Avenue Corridor Study – Main Avenue to 17th Street E

Subject: Study Review Committee Meeting

Date: Friday, October 19, 2018

Time: 10:00 AM – 12:00 PM

Location: West Fargo City Hall – West Fargo Room
Conference Call Info: #866.583.7984 code: 1066009

1. Welcome/Introductions
2. Project Status Update
3. 2045 Traffic Projection Overview
 - a. Brian Ray explained Scenario Development & Analysis
4. Issues and Needs Discussion
 - a. Brian Ray explained Issues and Needs Tech Memo
5. Discuss Alternatives
 - a. Segment 1 (Main Ave W – 10th Street W)
 - b. I-94 Overpass
 - i. Extend Cass 28 to the South
 - ii. Extend 13th Ave W to the West
 - iii. Cross perpendicular to I-94
 - c. Segment 2 (10th Street W – Sheyenne Street)
 - d. Segment 3 (Sheyenne Street – 6th Street E)
 - e. Segment 4 (6th Street E – 17th Street E)
6. Identify Alternatives to Develop
 - a. Segment 1 (Main Ave W – 10th Street W)
 - i. No - Build
 - ii. 2 Lane Divided
 - iii. Access Spacing Recommendations
 - b. I-94 Overpass
 - i. Cross perpendicular to I-94 (Identify ROW Needs)
 - c. Segment 2 (10th Street W – Sheyenne Street)
 - i. No - Build
 - ii. Spot Improvements
 - iii. Safety Improvements
 - d. Segment 3 (Sheyenne Street – 6th Street E)
 - i. 4 Lane Divided
 - ii. Access Control
 1. Right-in Right-out access
 2. Keep 1st Street E & 6th Street E as full access intersections
 3. Pedestrian crossing options Near 6th Street E
 - e. Segment 4 (6th Street E – 17th Street E)
 - i. No - Build
 - f. Consistent corridor
 - g. Pedestrian Facilities
7. Next Steps
8. Adjourn



Action Items

Action Item	Responsible Party	Due Date
Develop Alternatives	HDR	

Minutes

Project: FM Metro COG: 13th Avenue Corridor Study – Main Avenue to 17th Street E

Subject: Study Review Committee Meeting

Date: Tuesday, January 22, 2019

Time: 10:00 AM – 11:30 AM

Location: West Fargo City Hall – West Fargo Room
Conference Call Info: #515.739.1015 ID: 994.487.338

1. Welcome/Introductions
2. Project Status Update
 - a. Matthew updated the SRC on project
3. Report Discussion / Comments
 - a. Verify Lane Configurations between 9th Street E and 17th Street E
 - b. SRC discussed showing bridge typical without raised median
 - c. Right-of-Way Costs are low
 - i. Due to the variability in ROW it was discussed to remove specific cost of ROW.
 - d. Simplify Cost Estimates to better represent what is included
4. Final Report Submittal (2/1/2019)
5. Final Report Presentations
 - a. Presentations to be made at:
 - i. West Fargo Planning Commission (2nd Tuesday of Month)
 - ii. West Fargo City Commission (1st & 3rd Monday of Month)
 - iii. Metro COG Transportation Technical Committee (2nd Thursday of Month)
 - iv. Metro COG Policy Board (3rd Thursday of Month)
6. Adjourn

Action Items

Action Item	Responsible Party	Due Date
SRC Review Comments	SRC	1/25/2019
Final Report	HDR	2/1/2019

Sign-In Sheet

Project: FM Metro COG: 13th Avenue Corridor Study – Main Avenue to 17th Street E

Subject: Study Review Committee Meeting

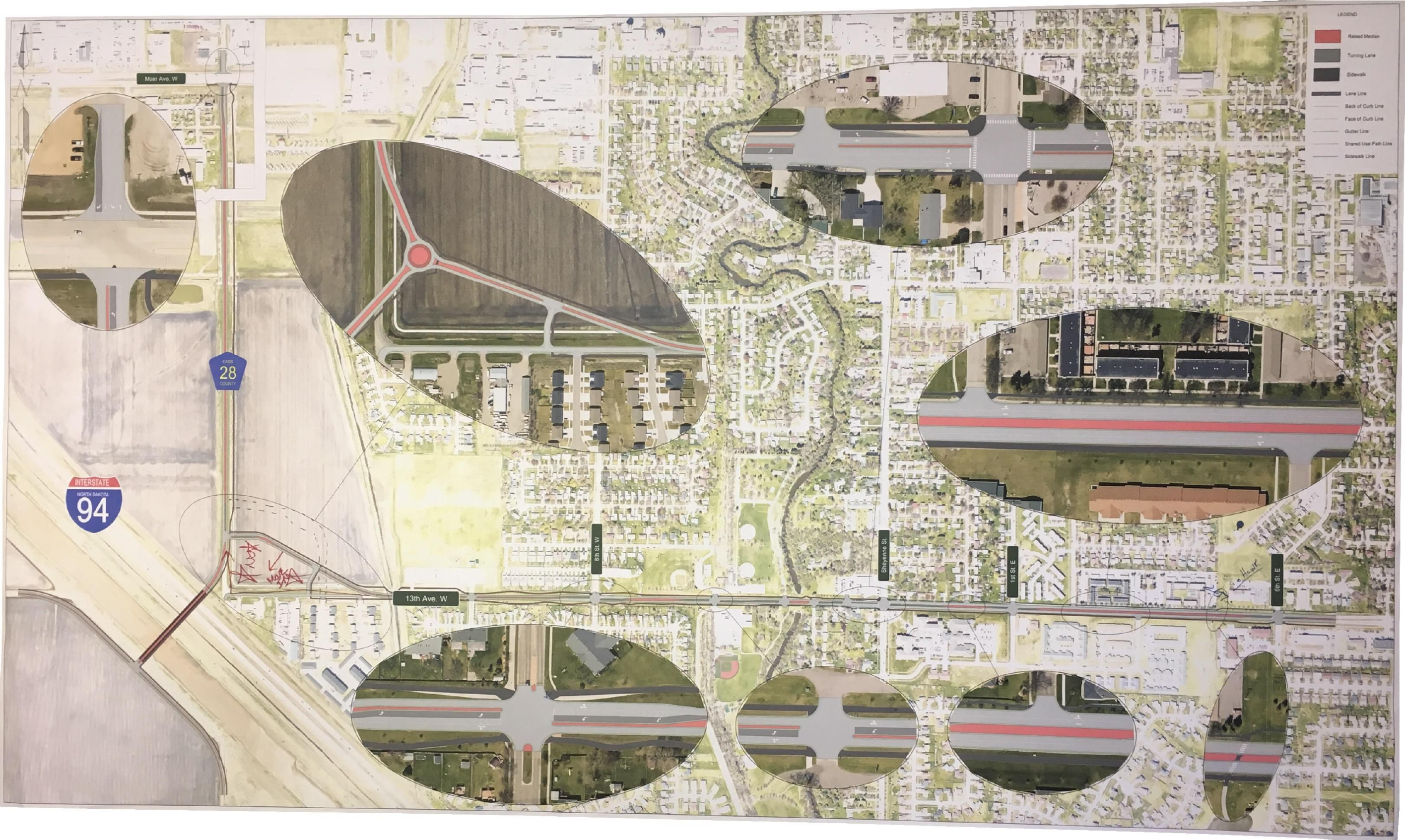
Date: Tuesday, January 22, 2019

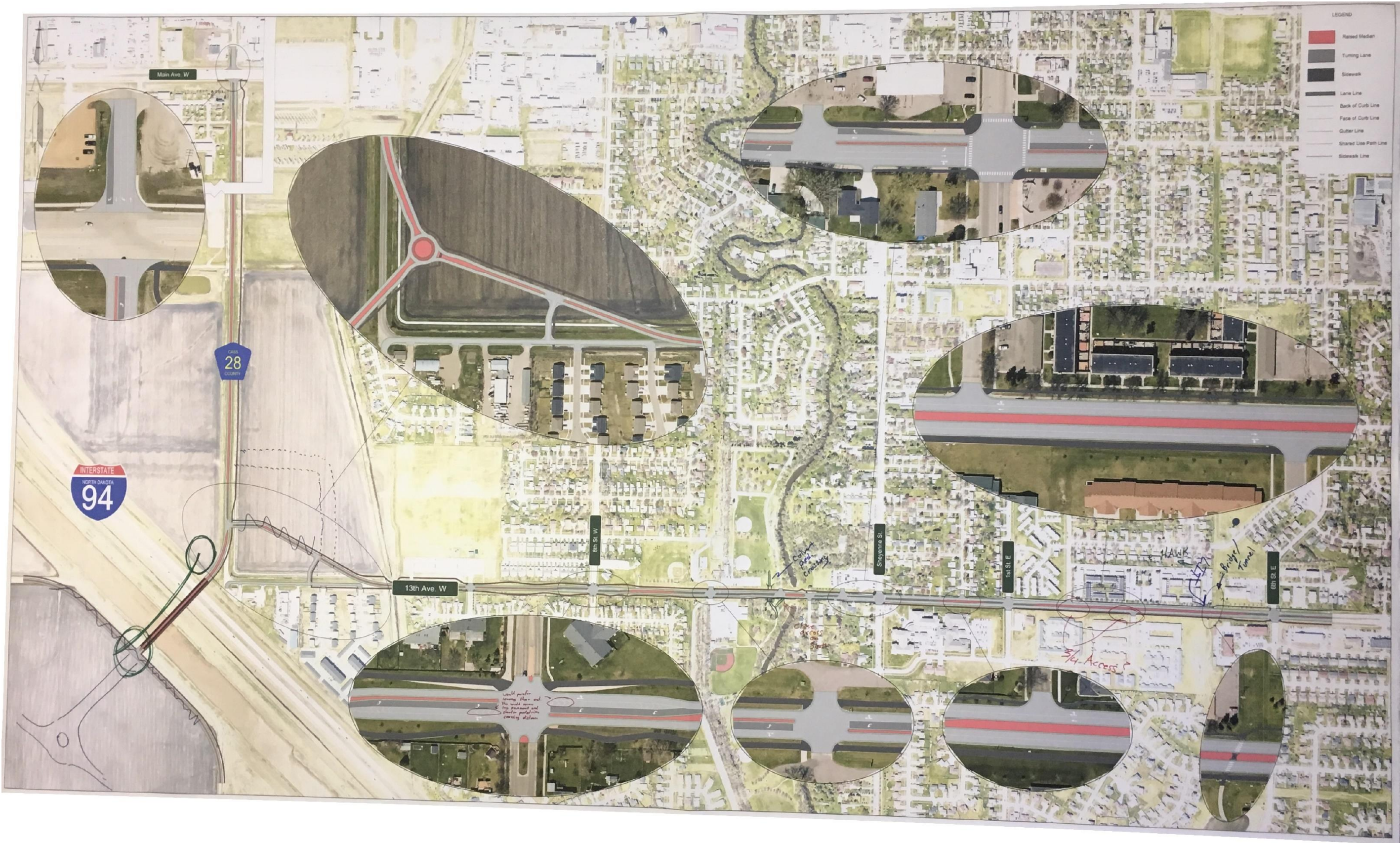
Time: 10:00 AM – 11:30 AM

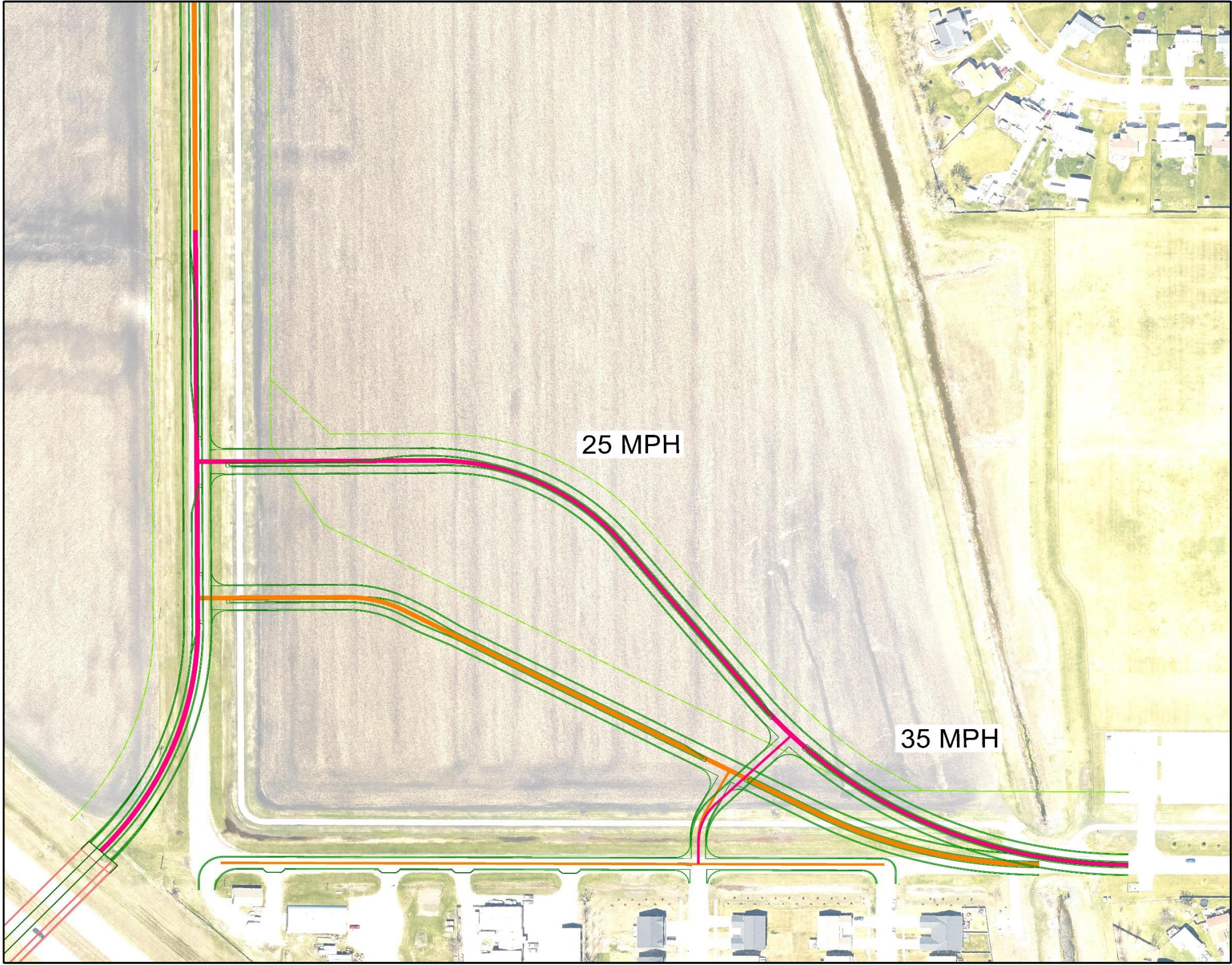
Location: West Fargo City Hall – West Fargo Room
Conference Call Info: #515.739.1015 ID: 994.487.338

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Appendix B – Synchro Data

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Lanes, Volumes, Timings

1: 17th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	452	21	9	208	43	21	51	27	100	33	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	160		0	230		0	0		0	0		100
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	120			120			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992				0.850		0.968				0.850
Flt Protected	0.950			0.950				0.988			0.963	
Satd. Flow (prot)	1604	3234	0	1583	3167	1417	0	1641	0	0	1620	1430
Flt Permitted	0.552			0.403				0.858			0.659	
Satd. Flow (perm)	932	3234	0	672	3167	1417	0	1425	0	0	1109	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				60		18				84
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		674			651			394			798	
Travel Time (s)		13.1			12.7			10.7			21.8	
Peak Hour Factor	0.63	0.73	0.58	0.56	0.90	0.72	0.58	0.64	0.75	0.61	0.64	0.82
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	4	0	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	179	619	36	16	231	60	36	80	36	164	52	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	179	655	0	16	231	60	0	152	0	0	216	84
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.13	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	

Lanes, Volumes, Timings

1: 17th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		8
Detector Phase	5	2		1	6	6	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	19.0	45.0		11.0	37.0	37.0	44.0	44.0		44.0	44.0	44.0
Total Split (s)	19.0	45.0		11.0	37.0	37.0	44.0	44.0		44.0	44.0	44.0
Total Split (%)	19.0%	45.0%		11.0%	37.0%	37.0%	44.0%	44.0%		44.0%	44.0%	44.0%
Maximum Green (s)	14.0	39.6		6.2	31.5	31.5	37.7	37.7		38.0	38.0	38.0
Yellow Time (s)	3.0	3.6		3.0	3.6	3.6	3.2	3.2		3.2	3.2	3.2
All-Red Time (s)	2.0	1.8		1.8	1.9	1.9	3.1	3.1		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	5.0	5.4		4.8	5.5	5.5		6.3			6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)		14.0			16.0	16.0	26.0	26.0		22.0	22.0	22.0
Pedestrian Calls (#/hr)		0			0	0	0	0		0	0	0
Act Effct Green (s)	64.8	59.8		55.6	48.9	48.9		23.9			24.2	24.2
Actuated g/C Ratio	0.65	0.60		0.56	0.49	0.49		0.24			0.24	0.24
v/c Ratio	0.27	0.34		0.04	0.15	0.08		0.43			0.80	0.20
Control Delay	9.7	15.0		9.7	16.9	6.0		30.2			56.4	6.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	9.7	15.0		9.7	16.9	6.0		30.2			56.4	6.7
LOS	A	B		A	B	A		C			E	A
Approach Delay		13.8			14.4			30.2			42.5	
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	42	134		3	40	0		72			130	0
Queue Length 95th (ft)	69	190		9	84	16		74			121	26
Internal Link Dist (ft)		594			571			314			718	
Turn Bay Length (ft)	160			230								100
Base Capacity (vph)	699	1938		434	1549	724		548			421	595
Starvation Cap Reductn	0	0		0	0	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	0.26	0.34		0.04	0.15	0.08		0.28			0.51	0.14

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

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

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 20.9

Intersection LOS: C

Intersection Capacity Utilization 47.6%

ICU Level of Service A

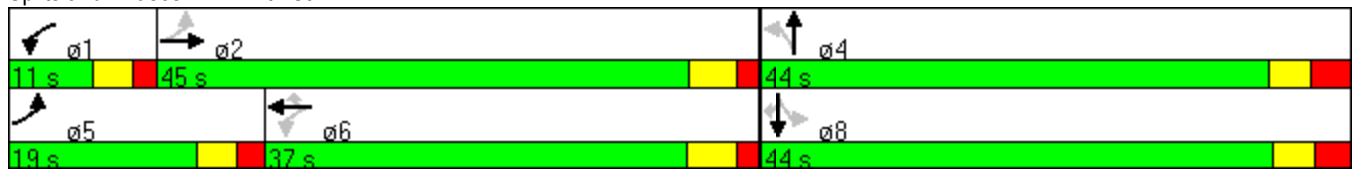
Analysis Period (min) 15

Lanes, Volumes, Timings

1: 17th St

12/22/2017

Splits and Phases: 1: 17th St



Lanes, Volumes, Timings
8: 9th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	189	307	167	108	177	88	124	514	161	89	392	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	165		230	230		380	220		0	300		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	95			100			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430	1614	1699	1444	1568	3112	0
Flt Permitted	0.493			0.501			0.408			0.178		
Satd. Flow (perm)	846	3260	1458	843	3197	1430	693	1699	1444	294	3112	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			111			192		8	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		681			935			622			954	
Travel Time (s)		13.3			18.2			14.1			21.7	
Peak Hour Factor	0.56	0.72	0.72	0.79	0.92	0.79	0.78	0.82	0.84	0.72	0.84	0.68
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	6%	6%	6%
Adj. Flow (vph)	338	426	232	137	192	111	159	627	192	124	467	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	338	426	232	137	192	111	159	627	192	124	495	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		

Lanes, Volumes, Timings

8: 9th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	13.0	28.0	28.0	10.0	25.0	25.0	13.0	51.0	51.0	11.0	49.0	
Total Split (s)	13.0	28.0	28.0	10.0	25.0	25.0	13.0	51.0	51.0	11.0	49.0	
Total Split (%)	13.0%	28.0%	28.0%	10.0%	25.0%	25.0%	13.0%	51.0%	51.0%	11.0%	49.0%	
Maximum Green (s)	8.1	22.4	22.4	5.1	19.3	19.3	7.7	44.6	44.6	6.3	42.8	
Yellow Time (s)	3.0	3.6	3.6	3.0	3.6	3.6	3.0	3.2	3.2	3.0	3.2	
All-Red Time (s)	1.9	2.0	2.0	1.9	2.1	2.1	2.3	3.2	3.2	1.7	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.9	5.6	5.6	4.9	5.7	5.7	5.3	6.4	6.4	4.7	6.2	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		20.0	20.0		19.0	19.0		26.0	26.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	33.9	22.8	22.8	24.8	17.4	17.4	51.0	41.4	41.4	49.0	40.0	
Actuated g/C Ratio	0.34	0.23	0.23	0.25	0.17	0.17	0.51	0.41	0.41	0.49	0.40	
v/c Ratio	0.89	0.57	0.45	0.53	0.35	0.33	0.37	0.89	0.27	0.52	0.40	
Control Delay	59.5	40.2	10.5	35.2	38.0	13.3	13.4	43.2	3.5	18.7	21.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	59.5	40.2	10.5	35.2	38.0	13.3	13.4	43.2	3.5	18.7	21.6	
LOS	E	D	B	D	D	B	B	D	A	B	C	
Approach Delay		39.8			30.9			30.6			21.0	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	~217	137	6	76	61	0	43	344	0	32	107	
Queue Length 95th (ft)	157	141	25	108	95	44	66	425	31	48	137	
Internal Link Dist (ft)		601			855			542			874	
Turn Bay Length (ft)	165		230	230		380	220			300		
Base Capacity (vph)	381	785	528	260	617	366	433	758	750	240	1338	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.89	0.54	0.44	0.53	0.31	0.30	0.37	0.83	0.26	0.52	0.37	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 31.7

Intersection LOS: C

Intersection Capacity Utilization 76.7%

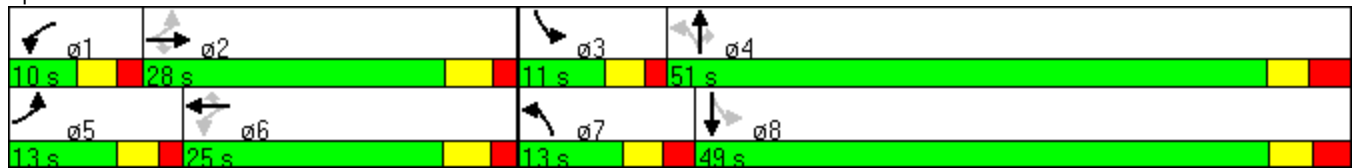
ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

Splits and Phases: 8: 9th St



Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	194	139	72	67	73	114	340	184	76	198	14
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	240		200	415		0	230		230	132		0
Storage Lanes	1		1	1		1	1		1	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
Frt			0.850			0.850			0.850		0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1614	1699	1444	1599	1683	1430	1630	1716	1458	1599	1654	0
Flt Permitted	0.702			0.528			0.478			0.295		
Satd. Flow (perm)	1193	1699	1444	888	1683	1430	820	1716	1458	496	1654	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			92			271		8	
Link Speed (mph)		25			35			30			25	
Link Distance (ft)		646			849			723			965	
Travel Time (s)		17.6			16.5			16.4			26.3	
Peak Hour Factor	0.80	0.90	0.85	0.69	0.80	0.79	0.71	0.82	0.68	0.76	0.88	0.50
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	40	216	164	104	84	92	161	415	271	100	225	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	216	164	104	84	92	161	415	271	100	253	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

12/22/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	10.0	30.0	30.0	10.0	30.0	30.0	11.0	49.0	49.0	11.0	49.0	
Total Split (s)	10.0	30.0	30.0	10.0	30.0	30.0	11.0	49.0	49.0	11.0	49.0	
Total Split (%)	10.0%	30.0%	30.0%	10.0%	30.0%	30.0%	11.0%	49.0%	49.0%	11.0%	49.0%	
Maximum Green (s)	5.4	24.3	24.3	5.5	24.7	24.7	6.5	43.4	43.4	6.4	43.1	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2	3.0	3.0	
All-Red Time (s)	1.6	2.7	2.7	1.5	2.1	2.1	1.5	2.4	2.4	1.6	2.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	5.7	5.7	4.5	5.3	5.3	4.5	5.6	5.6	4.6	5.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		13.0	13.0		13.0	13.0		17.0	17.0		16.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	43.5	36.7	36.7	46.9	40.6	40.6	38.8	32.5	32.5	37.7	30.0	
Actuated g/C Ratio	0.44	0.37	0.37	0.47	0.41	0.41	0.39	0.32	0.32	0.38	0.30	
v/c Ratio	0.07	0.35	0.26	0.22	0.12	0.14	0.43	0.74	0.41	0.39	0.50	
Control Delay	18.0	29.4	6.1	23.9	30.8	13.3	20.8	38.1	4.5	20.0	29.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	18.0	29.4	6.1	23.9	30.8	13.3	20.8	38.1	4.5	20.0	29.8	
LOS	B	C	A	C	C	B	C	D	A	B	C	
Approach Delay		19.2			22.5			24.1			27.0	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	13	106	0	42	41	0	62	237	0	37	125	
Queue Length 95th (ft)	34	195	43	71	75	28	66	263	9	47	166	
Internal Link Dist (ft)		566			769			643			885	
Turn Bay Length (ft)	240		200	415			230		230	132		
Base Capacity (vph)	547	624	634	476	683	635	371	745	786	258	717	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.35	0.26	0.22	0.12	0.14	0.43	0.56	0.34	0.39	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

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

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 23.3

Intersection LOS: C

Intersection Capacity Utilization 56.4%

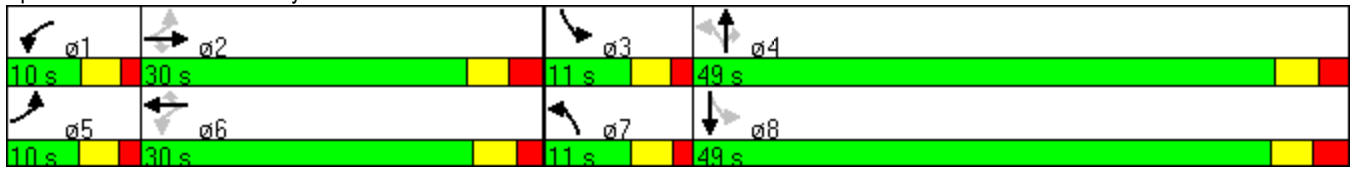
ICU Level of Service B

Analysis Period (min) 15

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

12/22/2017

Splits and Phases: 22: Sheyenne St & 13th Ave



Lanes, Volumes, Timings
24: 6th St & 13th Ave

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	499	15	10	206	33	73	56	78	69	25	9
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	140		0	92		0	100		100	100		0
Storage Lanes	1		0	1		0	1		1	0		1
Taper Length (ft)	25			80			50			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.974				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.962	
Satd. Flow (prot)	1630	3234	0	1630	3175	0	1630	1716	1458	0	1650	1458
Flt Permitted	0.584			0.412			0.641				0.722	
Satd. Flow (perm)	1002	3234	0	707	3175	0	1100	1716	1458	0	1239	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			48				132			16
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		489			566			615			526	
Travel Time (s)		9.5			11.0			16.8			14.3	
Peak Hour Factor	0.53	0.85	0.47	0.42	0.92	0.69	0.79	0.74	0.59	0.48	0.62	0.56
Adj. Flow (vph)	32	587	32	24	224	48	92	76	132	144	40	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	619	0	24	272	0	92	76	132	0	184	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8

Lanes, Volumes, Timings
24: 6th St & 13th Ave

12/22/2017

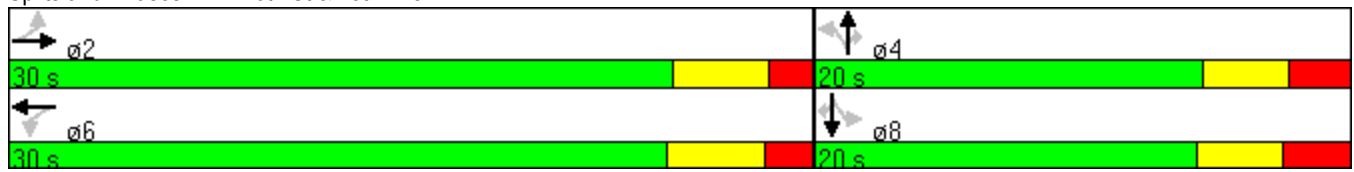
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Maximum Green (s)	24.7	24.7		24.5	24.5		14.4	14.4	14.4	14.2	14.2	14.2
Yellow Time (s)	3.6	3.6		3.6	3.6		3.2	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.7	1.7		1.9	1.9		2.4	2.4	2.4	2.6	2.6	2.6
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)	5.3	5.3		5.5	5.5		5.6	5.6	5.6		5.8	5.8
Lead/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	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max	Max	Max	Max	Max
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	14.0	14.0		12.0	12.0		17.0	17.0	17.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	24.7	24.7		24.5	24.5		14.4	14.4	14.4		14.2	14.2
Actuated g/C Ratio	0.49	0.49		0.49	0.49		0.29	0.29	0.29		0.28	0.28
v/c Ratio	0.06	0.39		0.07	0.17		0.29	0.15	0.26		0.52	0.04
Control Delay	7.2	8.5		11.2	9.6		16.9	14.3	4.9		21.4	7.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0
Total Delay	7.2	8.5		11.2	9.6		16.9	14.3	4.9		21.4	7.6
LOS	A	A		B	A		B	B	A		C	A
Approach Delay		8.4			9.7			11.0			20.3	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)	4	44		6	40		21	16	0		45	0
Queue Length 95th (ft)	9	87		8	52		44	33	8		59	5
Internal Link Dist (ft)		409			486			535			446	
Turn Bay Length (ft)	140			92			100		100			
Base Capacity (vph)	495	1605		346	1580		317	494	514		352	426
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	0.06	0.39		0.07	0.17		0.29	0.15	0.26		0.52	0.04
Intersection Summary												
Area Type:	Other											
Cycle Length: 50												
Actuated Cycle Length: 50												
Offset: 49 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 50												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.52												
Intersection Signal Delay: 10.9				Intersection LOS: B								
Intersection Capacity Utilization 41.1%				ICU Level of Service A								
Analysis Period (min) 15												

Lanes, Volumes, Timings

24: 6th St & 13th Ave

12/22/2017

Splits and Phases: 24: 6th St & 13th Ave



Lanes, Volumes, Timings

29: 14th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	441	24	24	245	20	51	15	58	31	12	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	285		0	175		213	0		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	120			100			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.880			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1599	3175	0	1583	3167	1417	1614	1495	0	1525	1544	0
Flt Permitted	0.591			0.383			0.726			0.448		
Satd. Flow (perm)	994	3175	0	638	3167	1417	1233	1495	0	719	1544	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				32		81			12	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		935			658			457			346	
Travel Time (s)		18.2			12.8			10.4			7.9	
Peak Hour Factor	0.58	0.75	0.86	0.67	0.94	0.62	0.91	0.75	0.72	0.65	0.33	0.25
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	9%	9%	9%
Adj. Flow (vph)	12	588	28	36	261	32	56	20	81	48	36	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	616	0	36	261	32	56	101	0	48	48	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		

Lanes, Volumes, Timings

29: 14th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	7.0	7.0		5.0	7.0	
Minimum Split (s)	14.0	54.0		14.0	54.0	54.0	21.0	21.0		11.0	32.0	
Total Split (s)	14.0	54.0		14.0	54.0	54.0	21.0	21.0		11.0	32.0	
Total Split (%)	14.0%	54.0%		14.0%	54.0%	54.0%	21.0%	21.0%		11.0%	32.0%	
Maximum Green (s)	9.3	48.7		9.5	48.5	48.5	14.7	14.7		6.1	25.9	
Yellow Time (s)	3.0	3.6		3.0	3.6	3.6	3.2	3.2		3.0	3.2	
All-Red Time (s)	1.7	1.7		1.5	1.9	1.9	3.1	3.1		1.9	2.9	
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)	4.7	5.3		4.5	5.5	5.5	6.3	6.3		4.9	6.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)		5.0			5.0	5.0	5.0	5.0			5.0	
Flash Dont Walk (s)		14.0			16.0	16.0	28.0	28.0			27.0	
Pedestrian Calls (#/hr)		0			0	0	0	0			0	
Act Effct Green (s)	71.7	68.5		74.3	72.9	72.9	10.2	10.2		17.6	17.0	
Actuated g/C Ratio	0.72	0.68		0.74	0.73	0.73	0.10	0.10		0.18	0.17	
v/c Ratio	0.02	0.28		0.07	0.11	0.03	0.44	0.45		0.27	0.18	
Control Delay	12.3	20.4		3.9	6.1	3.4	52.4	19.6		34.8	26.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	12.3	20.4		3.9	6.1	3.4	52.4	19.6		34.8	26.5	
LOS	B	C		A	A	A	D	B		C	C	
Approach Delay		20.3			5.6			31.3			30.6	
Approach LOS		C			A			C			C	
Queue Length 50th (ft)	5	181		11	43	0	34	12		25	19	
Queue Length 95th (ft)	m10	196		4	82	15	72	40		37	13	
Internal Link Dist (ft)		855			578			377			266	
Turn Bay Length (ft)	285			175		213						
Base Capacity (vph)	788	2178		567	2309	1042	181	289		177	409	
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	0.02	0.28		0.06	0.11	0.03	0.31	0.35		0.27	0.12	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 56 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 18.5

Intersection LOS: B

Intersection Capacity Utilization 41.2%

ICU Level of Service A

Analysis Period (min) 15

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

Lanes, Volumes, Timings

29: 14th St

12/22/2017

Splits and Phases: 29: 14th St



Intersection

Intersection Delay (sec/veh): 3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	46	469	14	13	256	70	21	6	26	44	7	8
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	200		0	200		0	0		160	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.79	0.63	0.63	0.80	0.71	0.89	0.56	0.59	0.80	0.88	0.67
Heavy Vehicles(%)	6	6	6	6	6	6	6	6	6	6	6	6
Movement Flow Rate	60	594	22	21	320	99	24	11	44	55	8	12
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	419	0	0	616	0	0	929	1184	308	833	1146	209
Stage 1	0	0	0	0	0	0	724	724	0	411	411	0
Stage 2	0	0	0	0	0	0	205	460	0	422	735	0
Follow-up Headway	2.26	-	-	2.26	0	0	3.56	4.06	3.36	3.56	4.06	3.36
Pot Capacity-1 Maneuver	1109	-	-	932	-	-	216	182	677	255	192	784
Stage 1	-	-	-	-	-	-	374	419	-	578	583	-
Stage 2	-	-	-	-	-	-	766	554	-	569	414	-
Mov Capacity-1 Maneuver	1109	-	-	932	-	-	193.8	168.4	677	214	177.6	784
Mov Capacity-2 Maneuver	-	-	-	-	-	-	193.8	168.4	-	214	177.6	-
Stage 1	-	-	-	-	-	-	374	396.4	-	578	570.2	-
Stage 2	-	-	-	-	-	-	727.4	541.8	-	489.6	391.6	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.7	0.4	18.623	27.2
HCM LOS	A	A	C	D

Lane	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	185	677							236
HCM Control Delay (s)	28.8	10.7	8.431	-	-	8.95	-	-	27.2
HCM Lane VC Ratio	0.185	0.065	0.054	-	-	0.022	-	-	0.317
HCM Lane LOS	D	B	A	-	-	A	-	-	D
HCM 95th Percentile Queue (veh)	0.66	0.208	0.171	-	-	0.068	-	-	1.309

Intersection

Intersection Delay (sec/veh): 5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	53	6	8	34	16	71
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	12			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.74	0.50	0.40	0.77	0.57	0.68
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	72	12	20	44	28	104
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	84	0	162	78
Stage 1	0	0	0	0	78	0
Stage 2	0	0	0	0	84	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1506	-	829	981
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	939	-
Mov Capacity-1 Maneuver	-	-	1506	-	818.2	981
Mov Capacity-2 Maneuver	-	-	-	-	818.2	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	926.8	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	2.3	9.5
HCM LOS	A	A	A

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	941				
HCM Control Delay (s)	9.5	-	-	7.423	0
HCM Lane VC Ratio	0.141	0	-	0.013	-
HCM Lane LOS	A	-	-	A	-
HCM 95th Percentile Queue (veh)	0.489	0	-	0.04	-

Intersection												
Intersection Delay (sec/veh)	12.2											
Intersection LOS	B											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	32	88	1	16	29	104	3	73	66	208	23	10
Peak Hour Factor	0.80	0.67	0.25	0.67	0.81	0.68	0.38	0.65	0.75	0.83	0.52	0.83
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	40	131	4	24	36	153	8	112	88	251	44	12
Number of Lanes	1	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	11.1	11.1	12.2	13.7
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Volume Left (%)	2%	100%	0%	100%	0%	100%	0%
Volume Thru (%)	51%	0%	99%	0%	22%	0%	70%
Volume Right (%)	46%	0%	1%	0%	78%	0%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume by Lane	142	32	89	16	133	208	33
Left Turning Volume	73	0	88	0	29	0	23
Through Volume	66	0	1	0	104	0	10
Right Turning Volume	3	32	0	16	0	208	0
Lane Flow Rate	208	40	135	24	189	251	56
Geometry Group	6	7	7	7	7	7	7
Degree of Utilization, X	0.346	0.077	0.242	0.046	0.307	0.455	0.091
Departure Headway, Hd	5.988	6.967	6.45	6.925	5.859	6.533	5.812
Convergence(Y/N)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Capacity	600	513	555	516	612	551	615
Service Time	4.041	4.727	4.21	4.684	3.617	4.28	3.559
HCM Lane V/C Ratio	0.347	0.078	0.243	0.047	0.309	0.456	0.091
HCM Control Delay	12.2	10.3	11.3	10	11.2	14.7	9.1
HCM Lane LOS	B	B	B	A	B	B	A
HCM 95th Percentile Queue	1.6	0.3	1	0.1	1.3	2.5	0.3

Intersection

Intersection Delay (sec/veh): 5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	25	304	8	8	130	30	7	62	21	39	26	24
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	0		0	0		0	0		0	0		0
Median Width		24			24			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.85	0.40	0.50	0.68	0.63	0.58	0.74	0.75	0.70	0.65	0.67
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	32	358	20	16	191	48	12	84	28	56	40	36
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	239	0	0	378	0	0	580	703	189	532	689	119
Stage 1	0	0	0	0	0	0	432	432	0	247	247	0
Stage 2	0	0	0	0	0	0	148	271	0	285	442	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1328	-	-	1177	-	-	398	360	822	430	367	909
Stage 1	-	-	-	-	-	-	572	581	-	735	701	-
Stage 2	-	-	-	-	-	-	840	684	-	698	575	-
Mov Capacity-1 Maneuver	1328	-	-	1177	-	-	339.3	346.4	822	328.6	353.2	909
Mov Capacity-2 Maneuver	-	-	-	-	-	-	339.3	346.4	-	328.6	353.2	-
Stage 1	-	-	-	-	-	-	572	567.1	-	735	691.2	-
Stage 2	-	-	-	-	-	-	749.6	674.4	-	560.8	561.2	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.6	0.5	18.1	18
HCM LOS	A	A	C	C

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	398							408
HCM Control Delay (s)	18.1	7.778	-	-	8.101	-	-	18
HCM Lane VC Ratio	0.311	0.024	-	-	0.014	-	-	0.322
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th Percentile Queue (veh)	1.306	0.074	-	-	0.041	-	-	1.373

Intersection

Intersection Delay (sec/veh): 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	31	437	17	12	177	24	5	3	37	7	2	13
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	130		0	150		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.85	0.61	0.60	0.82	0.67	0.42	0.38	0.66	0.44	0.81	0.61
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	40	514	28	20	216	36	12	8	56	16	2	21
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	252	0	0	542	0	0	757	900	271	614	895	126
Stage 1	0	0	0	0	0	0	608	608	0	274	274	0
Stage 2	0	0	0	0	0	0	149	292	0	340	621	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1313	-	-	1024	-	-	297	277	727	376	279	902
Stage 1	-	-	-	-	-	-	450	484	-	709	682	-
Stage 2	-	-	-	-	-	-	838	670	-	648	477	-
Mov Capacity-1 Maneuver	1313	-	-	1024	-	-	277.1	263.3	727	326.3	265.2	902
Mov Capacity-2 Maneuver	-	-	-	-	-	-	277.1	263.3	-	326.3	265.2	-
Stage 1	-	-	-	-	-	-	450	469.5	-	709	668.4	-
Stage 2	-	-	-	-	-	-	798.9	656.6	-	570.3	462.7	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.5	0.6	13.4	13.1
HCM LOS	A	A	B	B

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	506							486
HCM Control Delay (s)	13.4	7.827	-	-	8.586	-	-	13.1
HCM Lane VC Ratio	0.15	0.03	-	-	0.02	-	-	0.082
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th Percentile Queue (veh)	0.524	0.094	-	-	0.06	-	-	0.266

Intersection

Intersection Delay (sec/veh): 3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	12	403	4	31	232	3	16	12	83	2	3	6
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	200		0	180		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	1.00	0.85	0.33	0.70	0.82	0.38	0.67	0.60	0.69	0.50	0.75	0.50
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	12	474	12	44	283	8	24	20	120	4	4	12
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	1

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	291	0	0	486	0	0	736	883	243	646	885	145
Stage 1	0	0	0	0	0	0	504	504	0	375	375	0
Stage 2	0	0	0	0	0	0	232	379	0	271	510	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1270	-	-	1072	-	-	307	283	758	357	282	874
Stage 1	-	-	-	-	-	-	518	539	-	618	615	-
Stage 2	-	-	-	-	-	-	750	613	-	712	536	-
Mov Capacity-1 Maneuver	1270	-	-	1072	-	-	288	269	758	272.7	268	874
Mov Capacity-2 Maneuver	-	-	-	-	-	-	288	269	-	272.7	268	-
Stage 1	-	-	-	-	-	-	518	534.1	-	618	589.8	-
Stage 2	-	-	-	-	-	-	704.6	587.9	-	571.4	531.2	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.2	1.1	15.1	13
HCM LOS	A	A	C	B

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (vph)	520							270	874
HCM Control Delay (s)	15.1	7.862	-	-	8.503	-	-	18.7	9.2
HCM Lane VC Ratio	0.316	0.009	-	-	0.041	-	-	0.03	0.014
HCM Lane LOS	C	A	-	-	A	-	-	C	A
HCM 95th Percentile Queue (veh)	1.344	0.029	-	-	0.129	-	-	0.091	0.042

Lanes, Volumes, Timings

1: 17th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	595	22	51	775	207	35	44	36	152	43	137
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	160		0	230		0	0		0	0		100
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	120			120			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992				0.850		0.957				0.850
Flt Protected	0.950			0.950				0.983			0.965	
Satd. Flow (prot)	1604	3234	0	1583	3167	1417	0	1614	0	0	1624	1430
Flt Permitted	0.256			0.384				0.587			0.648	
Satd. Flow (perm)	432	3234	0	640	3167	1417	0	964	0	0	1090	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				235		19				151
Link Speed (mph)		35			35			25				25
Link Distance (ft)		674			651			394				798
Travel Time (s)		13.1			12.7			10.7				21.8
Peak Hour Factor	0.90	0.97	0.61	0.71	0.86	0.88	0.67	0.85	0.75	0.93	0.72	0.83
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	4	0	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	96	613	36	72	901	235	52	52	48	163	60	165
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	649	0	72	901	235	0	152	0	0	223	165
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.13	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	

Lanes, Volumes, Timings

1: 17th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		8
Detector Phase	5	2		1	6	6	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	13.0	69.0		13.0	69.0	69.0	28.0	28.0		28.0	28.0	28.0
Total Split (s)	13.0	69.0		13.0	69.0	69.0	28.0	28.0		28.0	28.0	28.0
Total Split (%)	11.8%	62.7%		11.8%	62.7%	62.7%	25.5%	25.5%		25.5%	25.5%	25.5%
Maximum Green (s)	8.0	63.6		8.2	63.5	63.5	21.7	21.7		22.0	22.0	22.0
Yellow Time (s)	3.0	3.6		3.0	3.6	3.6	3.2	3.2		3.2	3.2	3.2
All-Red Time (s)	2.0	1.8		1.8	1.9	1.9	3.1	3.1		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	5.0	5.4		4.8	5.5	5.5		6.3			6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)		14.0			16.0	16.0	26.0	26.0		22.0	22.0	22.0
Pedestrian Calls (#/hr)		0			0	0	0	0		0	0	0
Act Effct Green (s)	73.4	66.9		71.9	64.2	64.2		21.7			22.0	22.0
Actuated g/C Ratio	0.67	0.61		0.65	0.58	0.58		0.20			0.20	0.20
v/c Ratio	0.26	0.33		0.15	0.49	0.25		0.74			1.02	0.41
Control Delay	8.4	10.9		6.0	14.5	2.1		59.0			111.6	11.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	8.4	10.9		6.0	14.5	2.1		59.0			111.6	11.0
LOS	A	B		A	B	A		E			F	B
Approach Delay		10.6			11.6			59.0			68.8	
Approach LOS		B			B			E			E	
Queue Length 50th (ft)	17	82		14	184	0		89			~168	8
Queue Length 95th (ft)	m42	133		22	221	30		#174			#225	52
Internal Link Dist (ft)		594			571			314			718	
Turn Bay Length (ft)	160			230								100
Base Capacity (vph)	375	1970		496	1848	925		205			218	407
Starvation Cap Reductn	0	0		0	0	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	0.26	0.33		0.15	0.49	0.25		0.74			1.02	0.41

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 109 (99%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 23.1

Intersection LOS: C

Intersection Capacity Utilization 60.4%

ICU Level of Service B

Analysis Period (min) 15

Lanes, Volumes, Timings

1: 17th St

12/22/2017

~ 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.

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

Splits and Phases: 1: 17th St



Lanes, Volumes, Timings

8: 9th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	324	136	116	489	116	152	476	173	129	525	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	165		230	230		380	220		0	300		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	95			100			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430	1614	1699	1444	1568	3074	0
Flt Permitted	0.253			0.463			0.295			0.199		
Satd. Flow (perm)	434	3260	1458	779	3197	1430	501	1699	1444	329	3074	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168			153			208		19	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		681			935			622			954	
Travel Time (s)		13.3			18.2			14.1			21.7	
Peak Hour Factor	0.71	0.89	0.81	0.82	0.80	0.76	0.86	0.92	0.83	0.85	0.94	0.84
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	6%	6%	6%
Adj. Flow (vph)	213	364	168	141	611	153	177	517	208	152	559	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	213	364	168	141	611	153	177	517	208	152	646	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		

Lanes, Volumes, Timings

8: 9th St

12/22/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	15.0	21.0	21.0	26.0	32.0	32.0	13.0	50.0	50.0	13.0	50.0	
Total Split (s)	15.0	21.0	21.0	26.0	32.0	32.0	13.0	50.0	50.0	13.0	50.0	
Total Split (%)	13.6%	19.1%	19.1%	23.6%	29.1%	29.1%	11.8%	45.5%	45.5%	11.8%	45.5%	
Maximum Green (s)	10.1	15.4	15.4	21.1	26.3	26.3	7.7	43.6	43.6	8.3	43.8	
Yellow Time (s)	3.0	3.6	3.6	3.0	3.6	3.6	3.0	3.2	3.2	3.0	3.2	
All-Red Time (s)	1.9	2.0	2.0	1.9	2.1	2.1	2.3	3.2	3.2	1.7	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.9	5.6	5.6	4.9	5.7	5.7	5.3	6.4	6.4	4.7	6.2	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		20.0	20.0		19.0	19.0		26.0	26.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	42.3	29.7	29.7	41.9	29.6	29.6	47.4	38.4	38.4	48.5	38.6	
Actuated g/C Ratio	0.38	0.27	0.27	0.38	0.27	0.27	0.43	0.35	0.35	0.44	0.35	
v/c Ratio	0.72	0.41	0.33	0.37	0.71	0.31	0.60	0.87	0.33	0.63	0.59	
Control Delay	49.1	46.9	17.5	16.0	35.2	9.7	25.7	49.3	4.4	28.2	30.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	49.1	46.9	17.5	16.0	35.2	9.7	25.7	49.3	4.4	28.2	30.2	
LOS	D	D	B	B	D	A	C	D	A	C	C	
Approach Delay		40.9			27.9			34.3			29.8	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	129	133	12	56	220	38	68	328	0	57	183	
Queue Length 95th (ft)	#167	188	67	97	250	64	100	450	35	85	230	
Internal Link Dist (ft)		601			855			542			874	
Turn Bay Length (ft)	165		230	230		380	220			300		
Base Capacity (vph)	296	881	516	491	861	497	296	673	698	240	1235	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.72	0.41	0.33	0.29	0.71	0.31	0.60	0.77	0.30	0.63	0.52	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 84 (76%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 33.0

Intersection LOS: C

Intersection Capacity Utilization 76.8%

ICU Level of Service D

Analysis Period (min) 15

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

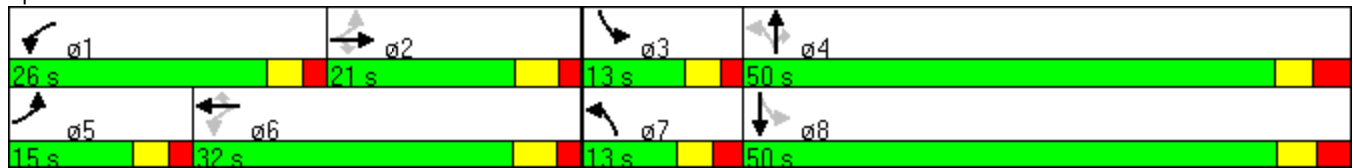
Lanes, Volumes, Timings

8: 9th St

12/22/2017

Queue shown is maximum after two cycles.

Splits and Phases: 8: 9th St



Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	158	110	213	216	106	132	233	109	108	309	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	240		200	415		0	230		230	132		0
Storage Lanes	1		1	1		1	1		1	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
Frt			0.850			0.850			0.850		0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1614	1699	1444	1599	1683	1430	1630	1716	1458	1599	1664	0
Flt Permitted	0.612			0.531			0.245			0.536		
Satd. Flow (perm)	1040	1699	1444	894	1683	1430	420	1716	1458	902	1664	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133			120			120		4	
Link Speed (mph)		25			35			30			25	
Link Distance (ft)		646			849			723			965	
Travel Time (s)		17.6			16.5			16.4			26.3	
Peak Hour Factor	0.39	0.92	0.83	0.83	0.92	0.88	0.83	0.97	0.91	0.87	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	28	172	133	257	235	120	159	240	120	124	347	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	172	133	257	235	120	159	240	120	124	375	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	10.0	28.0	28.0	22.0	40.0	40.0	16.0	47.0	47.0	13.0	44.0	
Total Split (s)	10.0	28.0	28.0	22.0	40.0	40.0	16.0	47.0	47.0	13.0	44.0	
Total Split (%)	9.1%	25.5%	25.5%	20.0%	36.4%	36.4%	14.5%	42.7%	42.7%	11.8%	40.0%	
Maximum Green (s)	5.4	22.3	22.3	17.5	34.7	34.7	11.5	41.4	41.4	8.4	38.1	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2	3.0	3.0	
All-Red Time (s)	1.6	2.7	2.7	1.5	2.1	2.1	1.5	2.4	2.4	1.6	2.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	5.7	5.7	4.5	5.3	5.3	4.5	5.6	5.6	4.6	5.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		13.0	13.0		13.0	13.0		17.0	17.0		16.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	40.5	33.3	33.3	54.3	47.0	47.0	44.8	32.7	32.7	39.3	29.8	
Actuated g/C Ratio	0.37	0.30	0.30	0.49	0.43	0.43	0.41	0.30	0.30	0.36	0.27	
v/c Ratio	0.07	0.33	0.25	0.48	0.33	0.18	0.54	0.47	0.23	0.33	0.83	
Control Delay	19.0	35.6	7.7	24.6	28.8	9.3	26.0	33.5	5.4	21.0	52.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	19.0	35.6	7.7	24.6	28.8	9.3	26.0	33.5	5.4	21.0	52.3	
LOS	B	D	A	C	C	A	C	C	A	C	D	
Approach Delay		23.1			23.2			24.7			44.5	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	10	96	0	108	108	7	69	137	0	53	246	
Queue Length 95th (ft)	12	179	41	157	170	36	91	189	37	77	321	
Internal Link Dist (ft)		566			769			643			885	
Turn Bay Length (ft)	240		200	415			230		230	132		
Base Capacity (vph)	414	515	530	556	719	679	300	646	624	377	579	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.33	0.25	0.46	0.33	0.18	0.53	0.37	0.19	0.33	0.65	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 109 (99%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 29.0

Intersection LOS: C

Intersection Capacity Utilization 66.2%

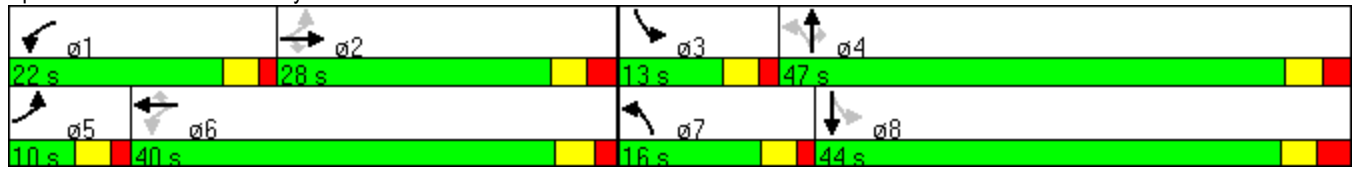
ICU Level of Service C

Analysis Period (min) 15

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

12/22/2017

Splits and Phases: 22: Sheyenne St & 13th Ave



Lanes, Volumes, Timings

24: 6th St & 13th Ave

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	422	22	82	565	33	34	28	52	42	26	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	140		0	92		0	100		100	100		0
Storage Lanes	1		0	1		0	1		1	0		1
Taper Length (ft)	25			80			50			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.971	
Satd. Flow (prot)	1630	3234	0	1630	3234	0	1630	1716	1458	0	1666	1458
Flt Permitted	0.381			0.412			0.700				0.806	
Satd. Flow (perm)	654	3234	0	707	3234	0	1201	1716	1458	0	1383	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			9				80			16
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		489			566			615			526	
Travel Time (s)		9.5			11.0			16.8			14.3	
Peak Hour Factor	0.60	0.86	0.79	0.76	0.84	0.83	0.61	0.78	0.65	0.81	0.72	0.63
Adj. Flow (vph)	20	491	28	108	673	40	56	36	80	52	36	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	519	0	108	713	0	56	36	80	0	88	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		4	4	4	8	8	8

Lanes, Volumes, Timings
24: 6th St & 13th Ave

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0		7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	65.0		18.0	69.0		27.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	14.0	65.0		18.0	69.0		27.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	12.7%	59.1%		16.4%	62.7%		24.5%	24.5%	24.5%	24.5%	24.5%	24.5%
Maximum Green (s)	9.5	59.7		13.4	63.5		21.4	21.4	21.4	21.2	21.2	21.2
Yellow Time (s)	3.0	3.6		3.0	3.6		3.2	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	1.5	1.7		1.6	1.9		2.4	2.4	2.4	2.6	2.6	2.6
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)	4.5	5.3		4.6	5.5		5.6	5.6	5.6		5.8	5.8
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		Max	Max	Max	Max	Max	Max
Walk Time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)		14.0			12.0		17.0	17.0	17.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	72.1	65.4		77.7	73.2		21.4	21.4	21.4		21.2	21.2
Actuated g/C Ratio	0.66	0.59		0.71	0.67		0.19	0.19	0.19		0.19	0.19
v/c Ratio	0.04	0.27		0.19	0.33		0.24	0.11	0.23		0.33	0.05
Control Delay	5.5	12.3		3.7	4.9		40.7	37.6	10.2		42.3	16.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0
Total Delay	5.5	12.3		3.7	4.9		40.7	37.6	10.2		42.3	16.4
LOS	A	B		A	A		D	D	B		D	B
Approach Delay		12.1			4.7			25.8			38.3	
Approach LOS		B			A			C			D	
Queue Length 50th (ft)	4	84		11	43		34	21	0		54	0
Queue Length 95th (ft)	8	128		m19	71		47	43	16		80	11
Internal Link Dist (ft)		409			486			535			446	
Turn Bay Length (ft)	140			92			100		100			
Base Capacity (vph)	534	1925		616	2154		234	334	348		267	294
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	0.04	0.27		0.18	0.33		0.24	0.11	0.23		0.33	0.05

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 88 (80%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.33

Intersection Signal Delay: 11.5

Intersection LOS: B

Intersection Capacity Utilization 46.1%

ICU Level of Service A

Analysis Period (min) 15

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

Lanes, Volumes, Timings

24: 6th St & 13th Ave

12/22/2017

Splits and Phases: 24: 6th St & 13th Ave



Lanes, Volumes, Timings

29: 14th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	471	33	56	699	93	61	26	76	85	28	47
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	285		0	175		213	0		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	120			100			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850		0.887			0.910	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1599	3159	0	1583	3167	1417	1614	1507	0	1525	1461	0
Flt Permitted	0.320			0.433			0.692			0.377		
Satd. Flow (perm)	538	3159	0	722	3167	1417	1176	1507	0	605	1461	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14				104		109			60	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		935			658			457			346	
Travel Time (s)		18.2			12.8			10.4			7.9	
Peak Hour Factor	0.77	0.96	0.75	0.88	0.91	0.89	0.66	0.72	0.70	0.64	0.70	0.78
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	9%	9%	9%
Adj. Flow (vph)	52	491	44	64	768	104	92	36	109	133	40	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	535	0	64	768	104	92	145	0	133	100	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		

Lanes, Volumes, Timings

29: 14th St

12/22/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	7.0	7.0		5.0	7.0	
Minimum Split (s)	12.0	68.0		12.0	68.0	68.0	19.0	19.0		11.0	30.0	
Total Split (s)	12.0	68.0		12.0	68.0	68.0	19.0	19.0		11.0	30.0	
Total Split (%)	10.9%	61.8%		10.9%	61.8%	61.8%	17.3%	17.3%		10.0%	27.3%	
Maximum Green (s)	7.3	62.7		7.5	62.5	62.5	12.7	12.7		6.1	23.9	
Yellow Time (s)	3.0	3.6		3.0	3.6	3.6	3.2	3.2		3.0	3.2	
All-Red Time (s)	1.7	1.7		1.5	1.9	1.9	3.1	3.1		1.9	2.9	
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)	4.7	5.3		4.5	5.5	5.5	6.3	6.3		4.9	6.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)		5.0			5.0	5.0	5.0	5.0			5.0	
Flash Dont Walk (s)		14.0			16.0	16.0	28.0	28.0			27.0	
Pedestrian Calls (#/hr)		0			0	0	0	0			0	
Act Effct Green (s)	72.6	66.6		73.1	66.4	66.4	11.6	11.6		24.0	22.8	
Actuated g/C Ratio	0.66	0.61		0.66	0.60	0.60	0.11	0.11		0.22	0.21	
v/c Ratio	0.12	0.28		0.12	0.40	0.12	0.74	0.57		0.73	0.29	
Control Delay	13.0	21.5		3.4	6.3	0.5	80.8	23.5		61.0	18.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	13.0	21.5		3.4	6.3	0.5	80.8	23.5		61.0	18.7	
LOS	B	C		A	A	A	F	C		E	B	
Approach Delay		20.8			5.4			45.7			42.9	
Approach LOS		C			A			D			D	
Queue Length 50th (ft)	23	167		6	50	0	63	23		80	23	
Queue Length 95th (ft)	m38	218		m14	95	m1	85	51		95	45	
Internal Link Dist (ft)		855			578			377			266	
Turn Bay Length (ft)	285			175		213						
Base Capacity (vph)	428	1917		541	1912	897	136	270		183	364	
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	0.12	0.28		0.12	0.40	0.12	0.68	0.54		0.73	0.27	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 26 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 19.1

Intersection LOS: B

Intersection Capacity Utilization 50.5%

ICU Level of Service A

Analysis Period (min) 15

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

Lanes, Volumes, Timings

29: 14th St

12/22/2017

Splits and Phases: 29: 14th St



Intersection

Intersection Delay (sec/veh): 3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	89	21	59	60	8	24
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	12			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.82	0.88	0.64	0.88	0.67	0.86
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	109	24	92	68	12	28
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	132	0	373	120
Stage 1	0	0	0	0	120	0
Stage 2	0	0	0	0	253	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1459	-	628	929
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	789	-
Mov Capacity-1 Maneuver	-	-	1459	-	588.4	929
Mov Capacity-2 Maneuver	-	-	-	-	588.4	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	739.3	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	4.4	9.8
HCM LOS	A	A	A

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	792				
HCM Control Delay (s)	9.8	-	-	7.634	0
HCM Lane VC Ratio	0.05	0	-	0.063	-
HCM Lane LOS	A	-	-	A	-
HCM 95th Percentile Queue (veh)	0.159	0	-	0.202	-

Intersection												
Intersection Delay (sec/veh)	12											
Intersection LOS	B											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	11	93	6	55	102	154	2	17	32	132	71	20
Peak Hour Factor	0.69	0.83	0.50	0.81	0.69	0.77	0.50	0.85	0.73	0.87	0.66	0.56
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	16	112	12	68	148	200	4	20	44	152	108	36
Number of Lanes	1	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	10.5	13.3	10.1	11.3
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Volume Left (%)	4%	100%	0%	100%	0%	100%	0%
Volume Thru (%)	33%	0%	94%	0%	40%	0%	78%
Volume Right (%)	63%	0%	6%	0%	60%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume by Lane	51	11	99	55	256	132	91
Left Turning Volume	17	0	93	0	102	0	71
Through Volume	32	0	6	0	154	0	20
Right Turning Volume	2	11	0	55	0	132	0
Lane Flow Rate	68	16	124	68	348	152	143
Geometry Group	6	7	7	7	7	7	7
Degree of Utilization, X	0.117	0.03	0.212	0.12	0.524	0.281	0.239
Departure Headway, Hd	6.208	6.717	6.166	6.359	5.427	6.664	6.004
Convergence(Y/N)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Capacity	577	533	582	564	664	540	599
Service Time	4.254	4.461	3.909	4.094	3.162	4.4	3.739
HCM Lane V/C Ratio	0.118	0.03	0.213	0.121	0.524	0.281	0.239
HCM Control Delay	10.1	9.7	10.6	10	14	12	10.6
HCM Lane LOS	B	A	B	A	B	B	B
HCM 95th Percentile Queue	0.4	0.1	0.8	0.4	3.3	1.2	0.9

Intersection												
Intersection Delay (sec/veh):		7.6										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	22	318	3	31	390	39	3	25	22	40	51	26
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	0		0	0		0	0		0	0		0
Median Width		24			24			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.55	0.81	0.38	0.65	0.96	0.65	0.75	0.78	0.69	0.67	0.71	0.81
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	40	393	8	48	406	60	4	32	32	60	72	32
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Major/Minor	Major 1		Major 2				Minor 1			Minor 1		
Conflicting Flow Rate - All	466	0	0	400	0	0	811	1039	200	824	1012	233
Stage 1	0	0	0	0	0	0	477	477	0	532	532	0
Stage 2	0	0	0	0	0	0	334	562	0	292	480	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1093	-	-	1154	-	-	271	229	809	265	238	769
Stage 1	-	-	-	-	-	-	538	554	-	499	524	-
Stage 2	-	-	-	-	-	-	653	508	-	692	553	-
Mov Capacity-1 Maneuver	1093	-	-	1154	-	-	183.2	211.5	809	212.1	219.8	769
Mov Capacity-2 Maneuver	-	-	-	-	-	-	183.2	211.5	-	212.1	219.8	-
Stage 1	-	-	-	-	-	-	538	533.5	-	499	502.5	-
Stage 2	-	-	-	-	-	-	514.3	487.2	-	601.7	532.5	-
Approach	EB		WB				NB			SB		
HCM Control Delay (s)	0.8		0.8				19.3			42.4		
HCM LOS	A		A				C			E		
Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (vph)	319							252				
HCM Control Delay (s)	19.3	8.419	-	-	8.254	-	-	42.4				
HCM Lane VC Ratio	0.213	0.037	-	-	0.041	-	-	0.649				
HCM Lane LOS	C	A	-	-	A	-	-	E				
HCM 95th Percentile Queue (veh)	0.792	0.114	-	-	0.129	-	-	4.062				

Intersection

Intersection Delay (sec/veh): 7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	16	359	17	56	608	5	29	7	52	36	11	51
Conflicting Peds. (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	130		0	150		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.68	0.71	0.88	0.91	0.42	0.81	0.58	0.87	0.71	0.55	0.60
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	20	528	24	64	668	12	36	12	60	51	20	85
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	680	0	0	552	0	0	1051	1387	276	1111	1393	340
Stage 1	0	0	0	0	0	0	580	580	0	801	801	0
Stage 2	0	0	0	0	0	0	471	807	0	310	592	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	909	-	-	1015	-	-	181	142	720	164	141	655
Stage 1	-	-	-	-	-	-	467	498	-	344	395	-
Stage 2	-	-	-	-	-	-	542	392	-	675	492	-
Mov Capacity-1 Maneuver	909	-	-	1015	-	-	130.2	130.1	720	130.9	129.2	655
Mov Capacity-2 Maneuver	-	-	-	-	-	-	130.2	130.1	-	130.9	129.2	-
Stage 1	-	-	-	-	-	-	467	487	-	344	370.1	-
Stage 2	-	-	-	-	-	-	418.1	367.3	-	590.3	481.2	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.3	0.8	31.8	47.3
HCM LOS	A	A	D	E

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	239							232
HCM Control Delay (s)	31.8	9.049	-	-	8.784	-	-	47.3
HCM Lane VC Ratio	0.45	0.022	-	-	0.063	-	-	0.671
HCM Lane LOS	D	A	-	-	A	-	-	E
HCM 95th Percentile Queue (veh)	2.171	0.067	-	-	0.2	-	-	4.239

Intersection

Intersection Delay (sec/veh): 62.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	19	437	63	62	476	28	13	2	17	122	13	123
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	200		0	200		0	0		160	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.82	0.69	0.88	0.87	0.62	0.71	0.75	0.65	0.87	0.65	0.43
Heavy Vehicles(%)	4	4	4	4	4	4	4	4	4	4	4	4
Movement Flow Rate	27	533	91	70	547	45	18	3	26	140	20	286
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	592	0	0	624	0	0	1056	1365	312	1032	1389	296
Stage 1	0	0	0	0	0	0	632	632	0	711	711	0
Stage 2	0	0	0	0	0	0	424	733	0	321	678	0
Follow-up Headway	2.24	-	-	2.24	0	0	3.54	4.04	3.34	3.54	4.04	3.34
Pot Capacity-1 Maneuver	967	-	-	940	-	-	177	144	679	184	139	693
Stage 1	-	-	-	-	-	-	430	467	-	385	430	-
Stage 2	-	-	-	-	-	-	573	420	-	660	445	-
Mov Capacity-1 Maneuver	967	-	-	940	-	-	84.3	129.5	679	160.7	125	693
Mov Capacity-2 Maneuver	-	-	-	-	-	-	84.3	129.5	-	160.7	125	-
Stage 1	-	-	-	-	-	-	430	453.9	-	385	397.8	-
Stage 2	-	-	-	-	-	-	295.6	388.5	-	613.2	432.5	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.4	1	31.775	249.1
HCM LOS	A	A	D	F

Lane	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	88	679							309
HCM Control Delay (s)	58.3	10.5	8.829	-	-	9.14	-	-	249.1
HCM Lane VC Ratio	0.238	0.039	0.028	-	-	0.075	-	-	1.444
HCM Lane LOS	F	B	A	-	-	A	-	-	F
HCM 95th Percentile Queue (veh)	0.852	0.12	0.085	-	-	0.243	-	-	24.103

Intersection

Intersection Delay (sec/veh): 12.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	29	537	33	138	734	38	7	10	51	21	13	29
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	200		0	180		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.93	0.63	0.73	0.95	0.79	0.58	0.50	0.71	0.88	0.65	0.48
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	40	577	52	189	773	48	12	20	72	24	20	60
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	1

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	821	0	0	630	0	0	1457	1882	315	1553	1884	410
Stage 1	0	0	0	0	0	0	683	683	0	1175	1175	0
Stage 2	0	0	0	0	0	0	774	1199	0	378	709	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	804	-	-	950	-	-	91	70	682	77	70	591
Stage 1	-	-	-	-	-	-	405	447	-	204	264	-
Stage 2	-	-	-	-	-	-	357	257	-	616	435	-
Mov Capacity-1 Maneuver	804	-	-	950	-	-	47.9	53.3	682	40.4	53.3	591
Mov Capacity-2 Maneuver	-	-	-	-	-	-	47.9	53.3	-	40.4	53.3	-
Stage 1	-	-	-	-	-	-	405	425.1	-	204	211.5	-
Stage 2	-	-	-	-	-	-	232.4	205.9	-	499.5	413.7	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.6	1.8	79.5	119.019
HCM LOS	A	A	F	F

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (vph)	142							45	591
HCM Control Delay (s)	79.5	9.71	-	-	9.728	-	-	266.7	11.8
HCM Lane VC Ratio	0.732	0.049	-	-	0.199	-	-	0.975	0.102
HCM Lane LOS	F	A	-	-	A	-	-	F	B
HCM 95th Percentile Queue (veh)	4.3	0.156	-	-	0.74	-	-	3.985	0.34

Lanes, Volumes, Timings

1: 17th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	510	20	10	230	45	20	50	25	105	35	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	160		0	230		0	0		0	0		100
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	120			120			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.965				0.850
Flt Protected	0.950			0.950				0.989			0.964	
Satd. Flow (prot)	1650	3333	0	1629	3257	1457	0	1684	0	0	1668	1471
Flt Permitted	0.529			0.435				0.899			0.773	
Satd. Flow (perm)	919	3333	0	746	3257	1457	0	1531	0	0	1338	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				49		21				82
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		674			651			394			798	
Travel Time (s)		13.1			12.7			10.7			21.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	4	0	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	130	554	22	11	250	49	22	54	27	114	38	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	576	0	11	250	49	0	103	0	0	152	82
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.09	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	

Lanes, Volumes, Timings

1: 17th St

9/14/2018

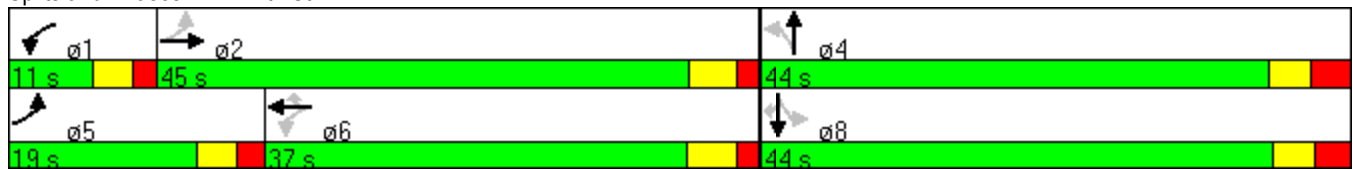
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		8
Detector Phase	5	2		1	6	6	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	19.0	45.0		11.0	37.0	37.0	44.0	44.0		44.0	44.0	44.0
Total Split (s)	19.0	45.0		11.0	37.0	37.0	44.0	44.0		44.0	44.0	44.0
Total Split (%)	19.0%	45.0%		11.0%	37.0%	37.0%	44.0%	44.0%		44.0%	44.0%	44.0%
Maximum Green (s)	14.0	39.6		6.2	31.5	31.5	37.7	37.7		38.0	38.0	38.0
Yellow Time (s)	3.0	3.6		3.0	3.6	3.6	3.2	3.2		3.2	3.2	3.2
All-Red Time (s)	2.0	1.8		1.8	1.9	1.9	3.1	3.1		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	5.0	5.4		4.8	5.5	5.5		6.3			6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max		None	Max	Max	None	None		None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)		14.0			16.0	16.0	26.0	26.0		22.0	22.0	22.0
Pedestrian Calls (#/hr)		0			0	0	0	0		0	0	0
Act Effct Green (s)	46.9	44.7		40.9	35.6	35.6		13.7			14.0	14.0
Actuated g/C Ratio	0.65	0.62		0.57	0.49	0.49		0.19			0.19	0.19
v/c Ratio	0.19	0.28		0.02	0.16	0.07		0.33			0.58	0.23
Control Delay	6.4	8.2		6.3	12.6	4.8		23.3			35.8	8.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	6.4	8.2		6.3	12.6	4.8		23.3			35.8	8.0
LOS	A	A		A	B	A		C			D	A
Approach Delay		7.8			11.2			23.3			26.1	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	19	48		1	32	0		30			60	0
Queue Length 95th (ft)	49	133		8	66	20		76			124	33
Internal Link Dist (ft)		594			571			314			718	
Turn Bay Length (ft)	160			230								100
Base Capacity (vph)	742	2068		503	1610	745		816			710	819
Starvation Cap Reductn	0	0		0	0	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	0.18	0.28		0.02	0.16	0.07		0.13			0.21	0.10
Intersection Summary												
Area Type: Other												
Cycle Length: 100												
Actuated Cycle Length: 72.1												
Natural Cycle: 100												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.58												
Intersection Signal Delay: 12.9 Intersection LOS: B												
Intersection Capacity Utilization 48.0% ICU Level of Service A												
Analysis Period (min) 15												

Lanes, Volumes, Timings

1: 17th St

9/14/2018

Splits and Phases: 1: 17th St



Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	505	95	15	275	70	120	85	25	45	85	210
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.970				0.850		0.917	
Flt Protected	0.950			0.950				0.972			0.993	
Satd. Flow (prot)	1613	3149	0	1613	3130	0	0	1651	1443	0	1546	0
Flt Permitted	0.397			0.404				0.554			0.923	
Satd. Flow (perm)	674	3149	0	686	3130	0	0	941	1443	0	1437	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			51				27		153	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		769			603			1224			442	
Travel Time (s)		17.5			13.7			33.4			12.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	245	549	103	16	299	76	130	92	27	49	92	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	652	0	16	375	0	0	222	27	0	369	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		

Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	21.5		9.5	21.5		27.5	27.5	27.5	27.5	27.5	
Total Split (s)	11.0	23.0		9.5	21.5		27.5	27.5	27.5	27.5	27.5	
Total Split (%)	18.3%	38.3%		15.8%	35.8%		45.8%	45.8%	45.8%	45.8%	45.8%	
Maximum Green (s)	5.5	17.5		4.0	16.0		22.0	22.0	22.0	22.0	22.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		17.0	17.0	17.0	17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effect Green (s)	21.4	20.5		14.8	10.7			15.3	15.3		15.3	
Actuated g/C Ratio	0.44	0.42		0.30	0.22			0.31	0.31		0.31	
v/c Ratio	0.60	0.48		0.06	0.52			0.75	0.06		0.66	
Control Delay	19.7	13.1		9.9	17.7			33.0	5.9		14.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	19.7	13.1		9.9	17.7			33.0	5.9		14.9	
LOS	B	B		A	B			C	A		B	
Approach Delay		14.9			17.4			30.1			14.9	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	42	58		2	42			53	0		47	
Queue Length 95th (ft)	#125	154		12	84			#155	13		134	
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200					160			
Base Capacity (vph)	406	1347		287	1095			439	687		752	
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	0.60	0.48		0.06	0.34			0.51	0.04		0.49	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 48.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 17.4

Intersection LOS: B

Intersection Capacity Utilization 74.3%

ICU Level of Service D

Analysis Period (min) 15

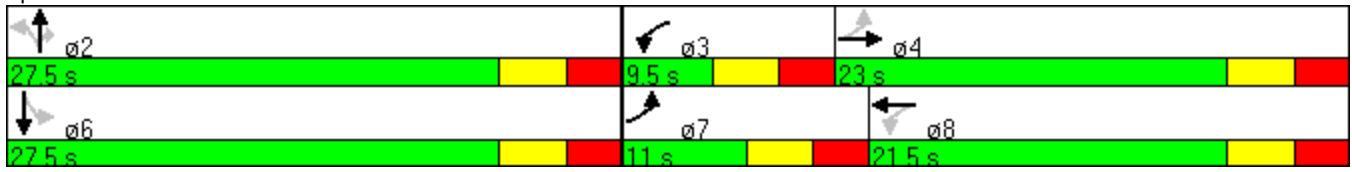
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

9/14/2018

Splits and Phases: 5: Main Ave & CR 28 / 15th St



Lanes, Volumes, Timings

8: 9th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	300	370	115	145	95	225	535	170	95	410	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	165		230	230		380	220		0	300		0
Storage Lanes	2		1	2		1	2		0	2		0
Taper Length (ft)	95			100			50			50		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	0.95
Frt			0.850			0.850		0.964			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3252	3353	1500	3190	3288	1471	3221	3201	0	3130	3197	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3252	3353	1500	3190	3288	1471	3221	3201	0	3130	3197	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			186			103		51			7	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		681			935			622			954	
Travel Time (s)		13.3			18.2			14.1			21.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	6%	6%	6%
Adj. Flow (vph)	207	326	402	125	158	103	245	582	185	103	446	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	207	326	402	125	158	103	245	767	0	103	473	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	5	2	7	1	6	3	7	4		3	8	
Permitted Phases			2			6						

Lanes, Volumes, Timings

8: 9th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	7	1	6	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	5.0	5.0	15.0		5.0	15.0	
Minimum Split (s)	9.9	30.6	10.3	9.9	29.7	9.7	10.3	37.4		9.7	39.2	
Total Split (s)	11.6	31.4	13.1	10.2	30.0	11.9	13.1	40.4		11.9	39.2	
Total Split (%)	12.4%	33.4%	14.0%	10.9%	31.9%	12.7%	14.0%	43.0%		12.7%	41.7%	
Maximum Green (s)	6.7	25.8	7.8	5.3	24.3	7.2	7.8	34.0		7.2	33.0	
Yellow Time (s)	3.0	3.6	3.0	3.0	3.6	3.0	3.0	3.2		3.0	3.2	
All-Red Time (s)	1.9	2.0	2.3	1.9	2.1	1.7	2.3	3.2		1.7	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.9	5.6	5.3	4.9	5.7	4.7	5.3	6.4		4.7	6.2	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		20.0			19.0			26.0			28.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	6.7	16.7	30.1	5.3	15.1	27.8	7.8	23.7		6.9	22.4	
Actuated g/C Ratio	0.09	0.22	0.41	0.07	0.20	0.37	0.10	0.32		0.09	0.30	
v/c Ratio	0.70	0.43	0.56	0.55	0.24	0.17	0.72	0.73		0.35	0.49	
Control Delay	48.8	28.1	13.2	45.0	27.3	5.0	47.4	25.1		36.9	22.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	48.8	28.1	13.2	45.0	27.3	5.0	47.4	25.1		36.9	22.4	
LOS	D	C	B	D	C	A	D	C		D	C	
Approach Delay		26.3			27.1			30.5			25.0	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	48	67	67	28	32	0	56	152		23	91	
Queue Length 95th (ft)	#110	120	180	#67	65	32	#125	211		51	132	
Internal Link Dist (ft)		601			855			542			874	
Turn Bay Length (ft)	165		230	230		380	220			300		
Base Capacity (vph)	295	1170	719	229	1081	621	340	1500		305	1431	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.70	0.28	0.56	0.55	0.15	0.17	0.72	0.51		0.34	0.33	

Intersection Summary

Area Type: Other

Cycle Length: 93.9

Actuated Cycle Length: 74.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 27.6

Intersection LOS: C

Intersection Capacity Utilization 61.8%

ICU Level of Service B

Analysis Period (min) 15

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

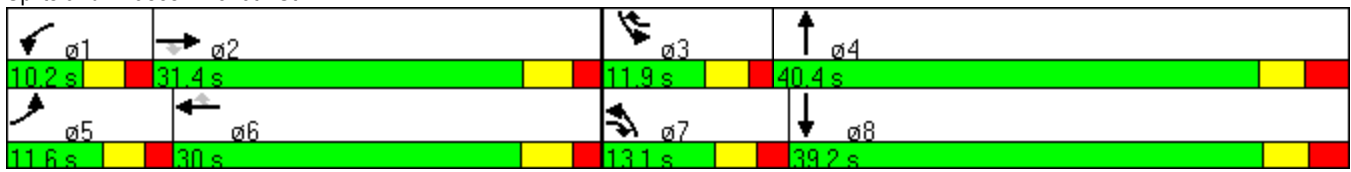
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

8: 9th St

9/14/2018

Splits and Phases: 8: 9th St



Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	335	180	95	150	80	165	410	280	85	245	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	240		200	415		0	230		230	132		0
Storage Lanes	1		1	1		1	1		1	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
Frt			0.850			0.850			0.850		0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1660	1748	1485	1644	1731	1471	1676	1765	1500	1644	1712	0
Flt Permitted	0.654			0.350			0.441			0.294		
Satd. Flow (perm)	1143	1748	1485	606	1731	1471	778	1765	1500	509	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			196			87			304		6	
Link Speed (mph)		25			35			30			25	
Link Distance (ft)		646			849			723			965	
Travel Time (s)		17.6			16.5			16.4			26.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	38	364	196	103	163	87	179	446	304	92	266	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	364	196	103	163	87	179	446	304	92	288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes						Yes	
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

9/14/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	9.6	23.7	23.7	9.5	23.3	23.3	9.5	27.6	27.6	9.6	26.9	
Total Split (s)	9.6	26.7	26.7	9.5	26.6	26.6	10.1	29.2	29.2	9.6	28.7	
Total Split (%)	12.8%	35.6%	35.6%	12.7%	35.5%	35.5%	13.5%	38.9%	38.9%	12.8%	38.3%	
Maximum Green (s)	5.0	21.0	21.0	5.0	21.3	21.3	5.6	23.6	23.6	5.0	22.8	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2	3.0	3.0	
All-Red Time (s)	1.6	2.7	2.7	1.5	2.1	2.1	1.5	2.4	2.4	1.6	2.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	5.7	5.7	4.5	5.3	5.3	4.5	5.6	5.6	4.6	5.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		13.0	13.0		13.0	13.0		17.0	17.0		16.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	26.2	21.2	21.2	27.1	23.4	23.4	29.3	24.0	24.0	27.1	20.8	
Actuated g/C Ratio	0.37	0.30	0.30	0.38	0.33	0.33	0.41	0.34	0.34	0.38	0.29	
v/c Ratio	0.08	0.70	0.34	0.34	0.29	0.16	0.46	0.75	0.43	0.34	0.57	
Control Delay	13.5	32.5	5.4	17.0	21.6	6.1	17.3	32.7	4.8	15.6	26.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.5	32.5	5.4	17.0	21.6	6.1	17.3	32.7	4.8	15.6	26.5	
LOS	B	C	A	B	C	A	B	C	A	B	C	
Approach Delay		22.4			16.4			20.6			23.9	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	10	153	0	28	60	0	48	188	0	24	109	
Queue Length 95th (ft)	27	#275	45	58	110	31	87	#336	52	49	183	
Internal Link Dist (ft)		566			769			643			885	
Turn Bay Length (ft)	240		200	415			230		230	132		
Base Capacity (vph)	456	521	580	304	570	542	392	602	712	274	558	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.70	0.34	0.34	0.29	0.16	0.46	0.74	0.43	0.34	0.52	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 71.2

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 21.0

Intersection LOS: C

Intersection Capacity Utilization 68.9%

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.

Lanes, Volumes, Timings
 22: Sheyenne St & 13th Ave

9/14/2018

Splits and Phases: 22: Sheyenne St & 13th Ave

 Ø1 9.5 s	 Ø2 26.7 s	 Ø3 9.6 s	 Ø4 29.2 s
 Ø5 9.6 s	 Ø6 26.6 s	 Ø7 10.1 s	 Ø8 28.7 s

Lanes, Volumes, Timings
24: 6th St & 13th Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	690	15	10	280	35	75	55	80	70	25	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	140		0	92		0	100		100	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			80			50			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.983				0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3343	0	1676	3296	0	1676	1765	1500	1676	1689	0
Flt Permitted	0.546			0.361			0.732			0.718		
Satd. Flow (perm)	964	3343	0	637	3296	0	1292	1765	1500	1267	1689	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			27				69		11	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		489			566			615			526	
Travel Time (s)		9.5			11.0			16.8			14.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	750	16	11	304	38	82	60	87	76	27	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	766	0	11	342	0	82	60	87	76	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	

Lanes, Volumes, Timings
24: 6th St & 13th Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	24.3	24.3		22.5	22.5		27.6	27.6	27.6	29.8	29.8	
Total Split (s)	25.2	25.2		25.2	25.2		29.8	29.8	29.8	29.8	29.8	
Total Split (%)	45.8%	45.8%		45.8%	45.8%		54.2%	54.2%	54.2%	54.2%	54.2%	
Maximum Green (s)	19.9	19.9		19.7	19.7		24.2	24.2	24.2	24.0	24.0	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.2	3.2	3.2	3.2	3.2	
All-Red Time (s)	1.7	1.7		1.9	1.9		2.4	2.4	2.4	2.6	2.6	
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)	5.3	5.3		5.5	5.5		5.6	5.6	5.6	5.8	5.8	
Lead/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	
Recall Mode	Max	Max		Max	Max		None	None	None	None	None	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	14.0	14.0		12.0	12.0		17.0	17.0	17.0	19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	24.6	24.6		24.4	24.4		8.5	8.5	8.5	8.3	8.3	
Actuated g/C Ratio	0.61	0.61		0.60	0.60		0.21	0.21	0.21	0.21	0.21	
v/c Ratio	0.03	0.38		0.03	0.17		0.30	0.16	0.24	0.29	0.11	
Control Delay	5.9	6.6		6.1	5.4		16.1	13.5	7.2	16.1	10.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	5.9	6.6		6.1	5.4		16.1	13.5	7.2	16.1	10.6	
LOS	A	A		A	A		B	B	A	B	B	
Approach Delay		6.6			5.4			12.0			14.3	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	1	45		1	16		15	11	3	14	5	
Queue Length 95th (ft)	9	94		7	38		40	30	26	38	20	
Internal Link Dist (ft)		409			486			535			446	
Turn Bay Length (ft)	140			92			100		100	100		
Base Capacity (vph)	587	2036		385	2004		775	1059	927	753	1009	
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	0.03	0.38		0.03	0.17		0.11	0.06	0.09	0.10	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 55

Actuated Cycle Length: 40.4

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 7.7

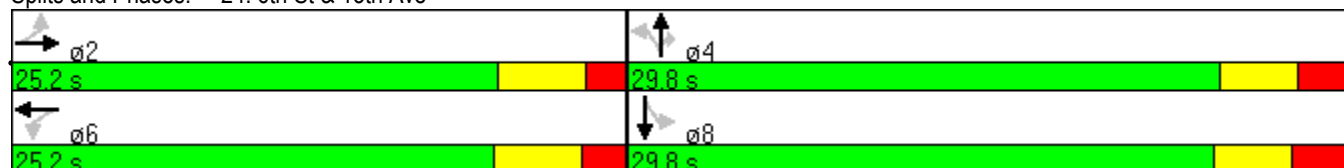
Intersection LOS: A

Intersection Capacity Utilization 46.2%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 24: 6th St & 13th Ave



Lanes, Volumes, Timings

29: 14th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	485	25	25	265	20	50	15	60	30	10	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	285		0	175		213	0		0	0		0
Storage Lanes	1		0	1		1	0		1	1		0
Taper Length (ft)	120			100			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850			0.850		0.953	
Flt Protected	0.950			0.950				0.963		0.950		
Satd. Flow (prot)	1644	3265	0	1629	3257	1457	0	1683	1485	1569	1574	0
Flt Permitted	0.575			0.423				0.765		0.426		
Satd. Flow (perm)	995	3265	0	725	3257	1457	0	1337	1485	703	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				22			65		5	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		935			658			457			346	
Travel Time (s)		18.2			12.8			10.4			7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	9%	9%	9%
Adj. Flow (vph)	5	527	27	27	288	22	54	16	65	33	11	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	554	0	27	288	22	0	70	65	33	16	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		6	4		4	8		

Lanes, Volumes, Timings

29: 14th St

9/14/2018

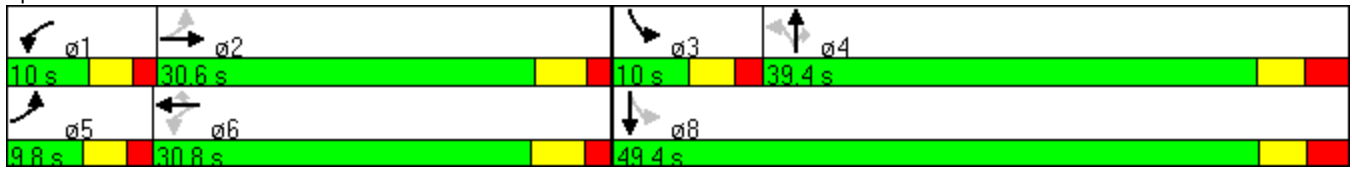
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	4	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	7.0	7.0	7.0	5.0	7.0	
Minimum Split (s)	9.7	24.3		9.5	26.5	26.5	39.3	39.3	39.3	9.9	38.1	
Total Split (s)	9.8	30.6		10.0	30.8	30.8	39.4	39.4	39.4	10.0	49.4	
Total Split (%)	10.9%	34.0%		11.1%	34.2%	34.2%	43.8%	43.8%	43.8%	11.1%	54.9%	
Maximum Green (s)	5.1	25.3		5.5	25.3	25.3	33.1	33.1	33.1	5.1	43.3	
Yellow Time (s)	3.0	3.6		3.0	3.6	3.6	3.2	3.2	3.2	3.0	3.2	
All-Red Time (s)	1.7	1.7		1.5	1.9	1.9	3.1	3.1	3.1	1.9	2.9	
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)	4.7	5.3		4.5	5.5	5.5		6.3	6.3	4.9	6.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	
Walk Time (s)		5.0			5.0	5.0	5.0	5.0	5.0		5.0	
Flash Dont Walk (s)		14.0			16.0	16.0	28.0	28.0	28.0		27.0	
Pedestrian Calls (#/hr)		0			0	0	0	0	0		0	
Act Effct Green (s)	34.4	33.4		35.5	34.9	34.9		8.8	8.8	12.7	12.3	
Actuated g/C Ratio	0.61	0.59		0.63	0.62	0.62		0.16	0.16	0.23	0.22	
v/c Ratio	0.01	0.29		0.05	0.14	0.02		0.33	0.23	0.14	0.05	
Control Delay	7.4	10.9		7.2	8.9	5.8		28.1	9.8	17.0	14.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	7.4	10.9		7.2	8.9	5.8		28.1	9.8	17.0	14.1	
LOS	A	B		A	A	A		C	A	B	B	
Approach Delay		10.8			8.5			19.3			16.0	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)	1	33		2	16	0		16	0	7	2	
Queue Length 95th (ft)	6	132		16	70	13		61	30	27	16	
Internal Link Dist (ft)		855			578			377			266	
Turn Bay Length (ft)	285			175		213						
Base Capacity (vph)	669	1941		549	2024	914		813	928	240	1253	
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	0.01	0.29		0.05	0.14	0.02		0.09	0.07	0.14	0.01	
Intersection Summary												
Area Type:	Other											
Cycle Length: 90												
Actuated Cycle Length: 56.2												
Natural Cycle: 90												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.33												
Intersection Signal Delay: 11.4				Intersection LOS: B								
Intersection Capacity Utilization 42.2%				ICU Level of Service A								
Analysis Period (min) 15												

Lanes, Volumes, Timings

29: 14th St

9/14/2018

Splits and Phases: 29: 14th St



Intersection

Intersection Delay (sec/veh): 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	30	820	15	10	340	25	5	5	35	5	5	15
Conflicting Peds. (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	130		0	150		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	33	891	16	11	370	27	5	5	38	5	5	16
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	397	0	0	908	0	0	1174	1383	454	919	1378	198
Stage 1	0	0	0	0	0	0	965	965	0	405	405	0
Stage 2	0	0	0	0	0	0	209	418	0	514	973	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1157	-	-	745	-	-	147	143	553	226	144	808
Stage 1	-	-	-	-	-	-	274	331	-	593	597	-
Stage 2	-	-	-	-	-	-	774	589	-	511	329	-
Mov Capacity-1 Maneuver	1157	-	-	745	-	-	135.2	136.9	553	197.5	137.9	808
Mov Capacity-2 Maneuver	-	-	-	-	-	-	135.2	136.9	-	197.5	137.9	-
Stage 1	-	-	-	-	-	-	274	321.7	-	593	588	-
Stage 2	-	-	-	-	-	-	740.1	580.2	-	454.7	319.8	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.3	0.3	17.8	17.6
HCM LOS	A	A	C	C

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	329							312
HCM Control Delay (s)	17.8	8.202	-	-	9.904	-	-	17.6
HCM Lane VC Ratio	0.149	0.028	-	-	0.015	-	-	0.087
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th Percentile Queue (veh)	0.516	0.087	-	-	0.044	-	-	0.284

Intersection

Intersection Delay (sec/veh): 1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	215	5	10	185	15	70
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	12			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	234	5	11	201	16	76
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	239	0	459	236
Stage 1	0	0	0	0	236	0
Stage 2	0	0	0	0	223	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1329	-	560	801
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	814	-
Mov Capacity-1 Maneuver	-	-	1329	-	555.5	801
Mov Capacity-2 Maneuver	-	-	-	-	555.5	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	807.5	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	0.4	10.5
HCM LOS	A	A	B

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	743				
HCM Control Delay (s)	10.5	-	-	7.731	0
HCM Lane VC Ratio	0.124	0	-	0.008	-
HCM Lane LOS	B	-	-	A	-
HCM 95th Percentile Queue (veh)	0.424	0	-	0.025	-

Intersection

Intersection Delay (sec/veh): 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	40	240	5	15	170	130	5	75	65	225	25	20
Conflicting Peds. (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	215		0	190		0	0		0	60		0
Median Width		12			12			12			12	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	43	261	5	16	185	141	5	82	71	245	27	22
Number of Lanes	1	1	0	1	1	0	0	1	0	1	1	0

Major/Minor

Lane

Conflicting Flow Rate - All	Capacity (vph)
Stage 1	HCM Control Delay (s)
Stage 2	HCM Lane VC Ratio
Follow-up Headway	HCM Lane LOS
Pot Capacity-1 Maneuver	HCM 95th Percentile Queue (veh)
Stage 1	
Stage 2	
Mov Capacity-1 Maneuver	
Mov Capacity-2 Maneuver	
Stage 1	
Stage 2	

Approach

HCM Control Delay (s)

HCM LOS

Intersection												
Intersection Delay (sec/veh):		4.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	25	640	10	10	275	30	5	60	20	40	25	25
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	100		0	100		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	27	696	11	11	299	33	5	65	22	43	27	27
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	332	0	0	707	0	0	940	1108	353	772	1098	166
Stage 1	0	0	0	0	0	0	755	755	0	337	337	0
Stage 2	0	0	0	0	0	0	185	353	0	435	761	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1222	-	-	887	-	-	218	209	642	289	211	850
Stage 1	-	-	-	-	-	-	367	415	-	651	640	-
Stage 2	-	-	-	-	-	-	799	629	-	570	412	-
Mov Capacity-1 Maneuver	1222	-	-	887	-	-	184.7	201.9	642	204.2	203.9	850
Mov Capacity-2 Maneuver	-	-	-	-	-	-	184.7	201.9	-	204.2	203.9	-
Stage 1	-	-	-	-	-	-	367	405.9	-	651	632.3	-
Stage 2	-	-	-	-	-	-	731.3	621.5	-	452	402.9	-
Approach	EB			WB			NB			SB		
HCM Control Delay (s)	0.3			0.3			29.2			27.1		
HCM LOS	A			A			D			D		
Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (vph)	239							259				
HCM Control Delay (s)	29.2	8.013	-	-	9.109	-	-	27.1				
HCM Lane VC Ratio	0.387	0.022	-	-	0.012	-	-	0.378				
HCM Lane LOS	D	A	-	-	A	-	-	D				
HCM 95th Percentile Queue (veh)	1.728	0.068	-	-	0.037	-	-	1.681				

Intersection

Intersection Delay (sec/veh): 2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	10	560	5	30	290	5	15	10	85	5	5	5
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	200		0	180		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	11	609	5	33	315	5	16	11	92	5	5	5
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	1

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	321	0	0	614	0	0	859	1019	307	715	1019	160
Stage 1	0	0	0	0	0	0	633	633	0	383	383	0
Stage 2	0	0	0	0	0	0	226	386	0	332	636	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1236	-	-	961	-	-	250	236	689	318	236	855
Stage 1	-	-	-	-	-	-	434	472	-	611	610	-
Stage 2	-	-	-	-	-	-	756	609	-	655	470	-
Mov Capacity-1 Maneuver	1236	-	-	961	-	-	235.9	225.9	689	256.7	225.9	855
Mov Capacity-2 Maneuver	-	-	-	-	-	-	235.9	225.9	-	256.7	225.9	-
Stage 1	-	-	-	-	-	-	434	467.8	-	611	589.3	-
Stage 2	-	-	-	-	-	-	719	588.3	-	549	465.8	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.1	0.8	15.1	16.867
HCM LOS	A	A	C	C

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (vph)	476							240	855
HCM Control Delay (s)	15.1	7.938	-	-	8.878	-	-	20.7	9.2
HCM Lane VC Ratio	0.251	0.009	-	-	0.034	-	-	0.045	0.006
HCM Lane LOS	C	A	-	-	A	-	-	C	A
HCM 95th Percentile Queue (veh)	0.985	0.027	-	-	0.105	-	-	0.142	0.019

Intersection												
Intersection Delay (sec/veh)	16.1											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	40	240	5	15	170	130	5	75	65	225	25	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	43	261	5	16	185	141	5	82	71	245	27	22
Number of Lanes	1	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	15.5	17.6	13.4	16.4
HCM LOS	C	C	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Volume Left (%)	3%	100%	0%	100%	0%	100%	0%
Volume Thru (%)	52%	0%	98%	0%	57%	0%	56%
Volume Right (%)	45%	0%	2%	0%	43%	0%	44%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume by Lane	145	40	245	15	300	225	45
Left Turning Volume	75	0	240	0	170	0	25
Through Volume	65	0	5	0	130	0	20
Right Turning Volume	5	40	0	15	0	225	0
Lane Flow Rate	158	43	266	16	326	245	49
Geometry Group	6	7	7	7	7	7	7
Degree of Utilization, X	0.313	0.089	0.504	0.033	0.586	0.508	0.09
Departure Headway, Hd	7.144	7.337	6.811	7.29	6.468	7.482	6.654
Convergence(Y/N)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Capacity	503	488	530	491	558	482	538
Service Time	5.197	5.08	4.554	5.031	4.209	5.227	4.399
HCM Lane V/C Ratio	0.314	0.088	0.502	0.033	0.584	0.508	0.091
HCM Control Delay	13.4	10.8	16.3	10.3	18	17.7	10.1
HCM Lane LOS	B	B	C	B	C	C	B
HCM 95th Percentile Queue	1.4	0.3	3	0.1	4.2	3.1	0.3

Lanes, Volumes, Timings
5: 15th & Main Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	505	95	15	275	70	120	85	25	45	85	210
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.970			0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1613	3149	0	1613	3130	0	1613	1640	0	1613	1698	1443
Flt Permitted	0.401			0.404			0.607			0.681		
Satd. Flow (perm)	681	3149	0	686	3130	0	1031	1640	0	1156	1698	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			42			22				228
Link Speed (mph)		30			30			25				25
Link Distance (ft)		769			603			1224				442
Travel Time (s)		17.5			13.7			33.4				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	245	549	103	16	299	76	130	92	27	49	92	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	652	0	16	375	0	130	119	0	49	92	228
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6

Lanes, Volumes, Timings

5: 15th & Main Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.5	21.5		9.5	21.5		9.5	27.5		9.5	27.5	27.5
Total Split (s)	11.0	23.0		9.5	21.5		9.5	28.0		9.5	28.0	28.0
Total Split (%)	15.7%	32.9%		13.6%	30.7%		13.6%	40.0%		13.6%	40.0%	40.0%
Maximum Green (s)	5.5	17.5		4.0	16.0		4.0	22.5		4.0	22.5	22.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	2.5
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)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		None	None		None	None	None
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	21.6	20.7		15.0	10.8		13.8	12.4		11.5	8.5	8.5
Actuated g/C Ratio	0.44	0.42		0.30	0.22		0.28	0.25		0.23	0.17	0.17
v/c Ratio	0.60	0.49		0.06	0.52		0.39	0.28		0.16	0.31	0.52
Control Delay	20.0	13.6		9.9	18.6		17.0	16.7		13.3	22.4	8.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	20.0	13.6		9.9	18.6		17.0	16.7		13.3	22.4	8.3
LOS	C	B		A	B		B	B		B	C	A
Approach Delay		15.3			18.2			16.9			12.5	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)	45	64		3	45		26	19		9	24	0
Queue Length 95th (ft)	#127	157		12	87		65	69		30	63	48
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200			200			200		
Base Capacity (vph)	406	1337		286	1081		337	787		309	803	803
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	0.60	0.49		0.06	0.35		0.39	0.15		0.16	0.11	0.28

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 49.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 15.6

Intersection LOS: B

Intersection Capacity Utilization 51.0%

ICU Level of Service A

Analysis Period (min) 15

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

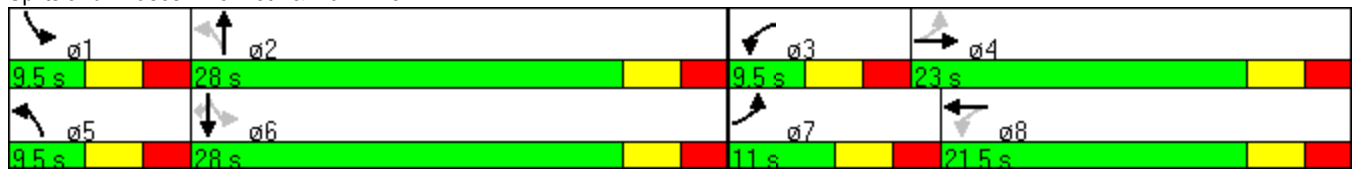
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

5: 15th & Main Ave

9/14/2018

Splits and Phases: 5: 15th & Main Ave



Lanes, Volumes, Timings

1: 17th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	565	20	50	765	205	35	45	35	155	45	140
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	160		0	230		0	0		0	0		100
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	120			120			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.959				0.850
Flt Protected	0.950			0.950				0.985			0.963	
Satd. Flow (prot)	1650	3336	0	1629	3257	1457	0	1667	0	0	1667	1471
Flt Permitted	0.249			0.404				0.842			0.729	
Satd. Flow (perm)	432	3336	0	693	3257	1457	0	1425	0	0	1262	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				223		25				152
Link Speed (mph)		35			35			25				25
Link Distance (ft)		674			651			394				798
Travel Time (s)		13.1			12.7			10.7				21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	4	0	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	92	614	22	54	832	223	38	49	38	168	49	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	636	0	54	832	223	0	125	0	0	217	152
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.09	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	

Lanes, Volumes, Timings

1: 17th St

9/14/2018

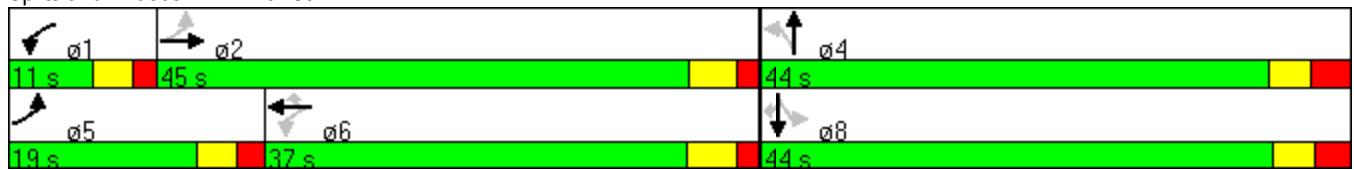
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		8
Detector Phase	5	2		1	6	6	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	19.0	45.0		11.0	37.0	37.0	44.0	44.0		44.0	44.0	44.0
Total Split (s)	19.0	45.0		11.0	37.0	37.0	44.0	44.0		44.0	44.0	44.0
Total Split (%)	19.0%	45.0%		11.0%	37.0%	37.0%	44.0%	44.0%		44.0%	44.0%	44.0%
Maximum Green (s)	14.0	39.6		6.2	31.5	31.5	37.7	37.7		38.0	38.0	38.0
Yellow Time (s)	3.0	3.6		3.0	3.6	3.6	3.2	3.2		3.2	3.2	3.2
All-Red Time (s)	2.0	1.8		1.8	1.9	1.9	3.1	3.1		2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	5.0	5.4		4.8	5.5	5.5		6.3			6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max		None	Max	Max	None	None		None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)		14.0			16.0	16.0	26.0	26.0		22.0	22.0	22.0
Pedestrian Calls (#/hr)		0			0	0	0	0		0	0	0
Act Effct Green (s)	46.3	41.3		42.7	37.2	37.2		19.0			19.3	19.3
Actuated g/C Ratio	0.59	0.53		0.55	0.48	0.48		0.24			0.25	0.25
v/c Ratio	0.25	0.36		0.12	0.54	0.27		0.34			0.70	0.32
Control Delay	9.6	13.8		8.7	18.5	3.6		22.5			39.6	6.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	9.6	13.8		8.7	18.5	3.6		22.5			39.6	6.1
LOS	A	B		A	B	A		C			D	A
Approach Delay		13.2			15.1			22.5			25.8	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	16	101		9	151	0		42			102	0
Queue Length 95th (ft)	47	178		30	272	44		87			175	41
Internal Link Dist (ft)		594			571			314			718	
Turn Bay Length (ft)	160			230								100
Base Capacity (vph)	486	1763		454	1551	811		714			626	806
Starvation Cap Reductn	0	0		0	0	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	0.19	0.36		0.12	0.54	0.27		0.18			0.35	0.19
Intersection Summary												
Area Type: Other												
Cycle Length: 100												
Actuated Cycle Length: 78.2												
Natural Cycle: 100												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.70												
Intersection Signal Delay: 16.6												
Intersection LOS: B												
Intersection Capacity Utilization 59.3%												
ICU Level of Service B												
Analysis Period (min) 15												

Lanes, Volumes, Timings

1: 17th St

9/14/2018

Splits and Phases: 1: 17th St



Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	465	175	60	510	30	125	155	15	120	195	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959			0.992				0.850		0.925	
Flt Protected	0.950			0.950				0.978			0.992	
Satd. Flow (prot)	1613	3094	0	1613	3201	0	0	1661	1443	0	1558	0
Flt Permitted	0.180			0.290				0.494			0.845	
Satd. Flow (perm)	306	3094	0	492	3201	0	0	839	1443	0	1327	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65			7				16		110	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		769			603			1224			442	
Travel Time (s)		17.5			13.7			33.4			12.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	261	505	190	65	554	33	136	168	16	130	212	429
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	695	0	65	587	0	0	304	16	0	771	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		

Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	21.5		9.5	21.5		27.5	27.5	27.5	27.5	27.5	
Total Split (s)	14.0	25.9		9.6	21.5		44.5	44.5	44.5	44.5	44.5	
Total Split (%)	17.5%	32.4%		12.0%	26.9%		55.6%	55.6%	55.6%	55.6%	55.6%	
Maximum Green (s)	8.5	20.4		4.1	16.0		39.0	39.0	39.0	39.0	39.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Walk Time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		17.0	17.0	17.0	17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effect Green (s)	29.1	22.3		20.1	16.0			39.0	39.0		39.0	
Actuated g/C Ratio	0.36	0.28		0.25	0.20			0.49	0.49		0.49	
v/c Ratio	1.04	0.76		0.36	0.91			0.74	0.02		1.10	
Control Delay	93.8	31.5		23.2	51.6			30.3	5.3		83.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	93.8	31.5		23.2	51.6			30.3	5.3		83.8	
LOS	F	C		C	D			C	A		F	
Approach Delay		48.5			48.7			29.0			83.8	
Approach LOS		D			D			C			F	
Queue Length 50th (ft)	~101	157		21	150			116	0		~414	
Queue Length 95th (ft)	#246	#246		47	#248			#255	9		#628	
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200					160			
Base Capacity (vph)	250	909		181	646			409	712		703	
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	1.04	0.76		0.36	0.91			0.74	0.02		1.10	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 56.3

Intersection LOS: E

Intersection Capacity Utilization 107.6%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

9/14/2018

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Main Ave & CR 28 / 15th St



Lanes, Volumes, Timings

8: 9th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	330	340	120	555	120	290	495	185	135	545	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	165		230	230		380	220		0	300		0
Storage Lanes	2		1	2		1	2		0	2		0
Taper Length (ft)	95			100			50			50		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	0.95
Frt			0.850			0.850		0.959			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3252	3353	1500	3190	3288	1471	3221	3184	0	3130	3165	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3252	3353	1500	3190	3288	1471	3221	3184	0	3130	3165	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			90			128		66			19	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		681			935			622			954	
Travel Time (s)		13.3			18.2			14.1			21.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	6%	6%	6%
Adj. Flow (vph)	174	359	370	130	603	130	315	538	201	147	592	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	359	370	130	603	130	315	739	0	147	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	5	2	7	1	6	3	7	4		3	8	
Permitted Phases			2			6						

Lanes, Volumes, Timings

8: 9th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	7	1	6	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0	5.0	5.0	15.0	5.0	5.0	15.0		5.0	15.0	
Minimum Split (s)	9.9	30.6	10.3	9.9	29.7	9.7	10.3	37.4		9.7	39.2	
Total Split (s)	12.0	28.5	16.0	12.0	28.5	11.4	16.0	38.1		11.4	33.5	
Total Split (%)	13.3%	31.7%	17.8%	13.3%	31.7%	12.7%	17.8%	42.3%		12.7%	37.2%	
Maximum Green (s)	7.1	22.9	10.7	7.1	22.8	6.7	10.7	31.7		6.7	27.3	
Yellow Time (s)	3.0	3.6	3.0	3.0	3.6	3.0	3.0	3.2		3.0	3.2	
All-Red Time (s)	1.9	2.0	2.3	1.9	2.1	1.7	2.3	3.2		1.7	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.9	5.6	5.3	4.9	5.7	4.7	5.3	6.4		4.7	6.2	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		20.0			19.0			26.0			28.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	7.2	23.0	39.2	7.0	20.0	32.5	10.6	26.9		6.7	22.6	
Actuated g/C Ratio	0.09	0.28	0.47	0.08	0.24	0.39	0.13	0.33		0.08	0.27	
v/c Ratio	0.62	0.39	0.49	0.48	0.76	0.20	0.76	0.68		0.58	0.77	
Control Delay	49.0	27.6	15.3	44.7	36.6	4.5	50.1	25.6		48.5	33.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	49.0	27.6	15.3	44.7	36.6	4.5	50.1	25.6		48.5	33.6	
LOS	D	C	B	D	D	A	D	C		D	C	
Approach Delay		26.7			33.0			33.0			36.3	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	47	85	104	35	157	1	86	161		40	170	
Queue Length 95th (ft)	#93	131	194	66	225	35	#159	227		#79	236	
Internal Link Dist (ft)		601			855			542			874	
Turn Bay Length (ft)	165		230	230		380	220			300		
Base Capacity (vph)	282	978	762	277	916	656	421	1274		256	1069	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.62	0.37	0.49	0.47	0.66	0.20	0.75	0.58		0.57	0.64	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 82.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 32.2

Intersection LOS: C

Intersection Capacity Utilization 66.8%

ICU Level of Service C

Analysis Period (min) 15

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

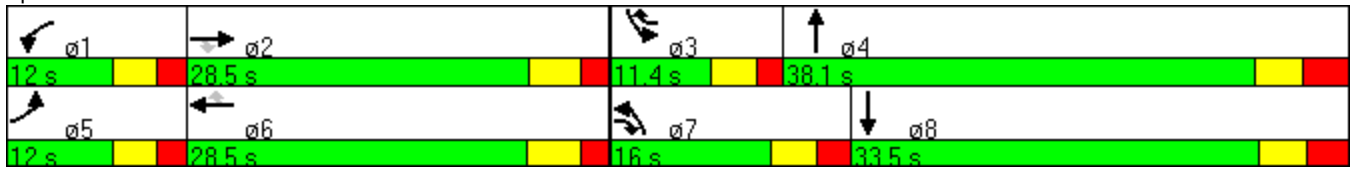
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

8: 9th St

9/14/2018

Splits and Phases: 8: 9th St



Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	295	185	240	335	115	190	275	180	130	370	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	240		200	415		0	230		230	132		0
Storage Lanes	1		1	1		1	1		1	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
Frt			0.850			0.850			0.850		0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1660	1748	1485	1644	1731	1471	1676	1765	1500	1644	1712	0
Flt Permitted	0.526			0.344			0.196			0.498		
Satd. Flow (perm)	919	1748	1485	595	1731	1471	346	1765	1500	862	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			201			125			196		5	
Link Speed (mph)		25			35			30			25	
Link Distance (ft)		646			849			723			965	
Travel Time (s)		17.6			16.5			16.4			26.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	16	321	201	261	364	125	207	299	196	141	402	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	321	201	261	364	125	207	299	196	141	435	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes						Yes	
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		

Lanes, Volumes, Timings

22: Sheyenne St & 13th Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	9.6	23.7	23.7	9.5	23.3	23.3	9.5	27.6	27.6	9.6	26.9	
Total Split (s)	9.6	25.0	25.0	12.0	27.4	27.4	11.0	28.4	28.4	9.6	27.0	
Total Split (%)	12.8%	33.3%	33.3%	16.0%	36.5%	36.5%	14.7%	37.9%	37.9%	12.8%	36.0%	
Maximum Green (s)	5.0	19.3	19.3	7.5	22.1	22.1	6.5	22.8	22.8	5.0	21.1	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2	3.0	3.0	
All-Red Time (s)	1.6	2.7	2.7	1.5	2.1	2.1	1.5	2.4	2.4	1.6	2.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	5.7	5.7	4.5	5.3	5.3	4.5	5.6	5.6	4.6	5.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		13.0	13.0		13.0	13.0		17.0	17.0		16.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	25.4	19.3	19.3	32.1	29.8	29.8	30.3	24.1	24.1	26.7	20.4	
Actuated g/C Ratio	0.34	0.26	0.26	0.43	0.40	0.40	0.41	0.32	0.32	0.36	0.27	
v/c Ratio	0.04	0.71	0.38	0.72	0.52	0.19	0.80	0.52	0.32	0.39	0.92	
Control Delay	12.9	35.3	6.0	28.9	21.9	4.7	40.4	25.3	4.9	17.1	53.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.9	35.3	6.0	28.9	21.9	4.7	40.4	25.3	4.9	17.1	53.5	
LOS	B	D	A	C	C	A	D	C	A	B	D	
Approach Delay		23.7			21.5			24.1			44.6	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	4	136	0	79	119	0	58	116	0	38	192	
Queue Length 95th (ft)	15	#245	48	#167	#253	36	#144	192	43	72	#360	
Internal Link Dist (ft)		566			769			643			885	
Turn Bay Length (ft)	240		200	415			230		230	132		
Base Capacity (vph)	364	454	534	363	694	665	258	573	618	362	490	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.71	0.38	0.72	0.52	0.19	0.80	0.52	0.32	0.39	0.89	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 74.3

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 27.8

Intersection LOS: C

Intersection Capacity Utilization 81.2%

ICU Level of Service D

Analysis Period (min) 15

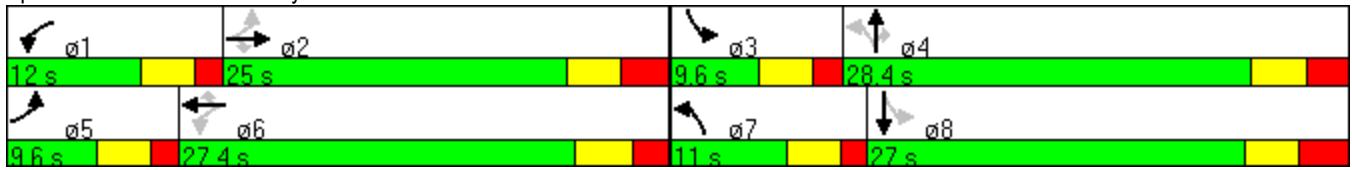
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 22: Sheyenne St & 13th Ave

9/14/2018

Splits and Phases: 22: Sheyenne St & 13th Ave



Lanes, Volumes, Timings

23: 1st St & 13th Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	560	5	30	640	40	5	25	20	40	50	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.991			0.945			0.971	
Flt Protected	0.950			0.950				0.995			0.983	
Satd. Flow (prot)	1676	3350	0	1676	3323	0	0	1659	0	0	1684	0
Flt Permitted	0.950			0.950				0.995			0.983	
Satd. Flow (perm)	1676	3350	0	1676	3323	0	0	1659	0	0	1684	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		849			489			370			658	
Travel Time (s)		16.5			9.5			10.1			17.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	609	5	33	696	43	5	27	22	43	54	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	614	0	33	739	0	0	54	0	0	124	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 46.4% ICU Level of Service A

Analysis Period (min) 15

Lanes, Volumes, Timings
24: 6th St & 13th Ave

9/14/2018

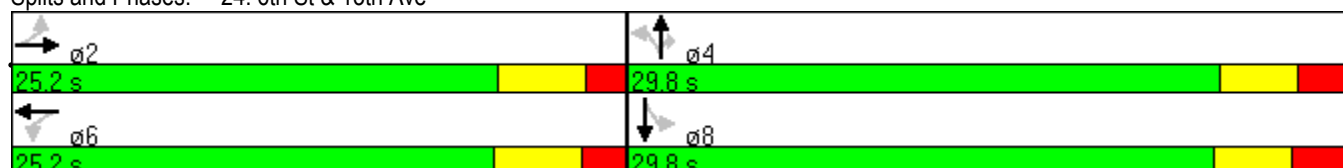
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	645	20	80	725	35	35	30	50	40	25	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	140		0	92		0	100		100	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			80			50			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.993				0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3336	0	1676	3329	0	1676	1765	1500	1676	1689	0
Flt Permitted	0.341			0.377			0.816			0.851		
Satd. Flow (perm)	602	3336	0	665	3329	0	1440	1765	1500	1502	1689	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			10				54		11	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		489			566			615			526	
Travel Time (s)		9.5			11.0			16.8			14.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	701	22	87	788	38	38	33	54	43	27	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	723	0	87	826	0	38	33	54	43	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	

Lanes, Volumes, Timings
24: 6th St & 13th Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	24.3	24.3		22.5	22.5		27.6	27.6	27.6	29.8	29.8	
Total Split (s)	25.2	25.2		25.2	25.2		29.8	29.8	29.8	29.8	29.8	
Total Split (%)	45.8%	45.8%		45.8%	45.8%		54.2%	54.2%	54.2%	54.2%	54.2%	
Maximum Green (s)	19.9	19.9		19.7	19.7		24.2	24.2	24.2	24.0	24.0	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.2	3.2	3.2	3.2	3.2	
All-Red Time (s)	1.7	1.7		1.9	1.9		2.4	2.4	2.4	2.6	2.6	
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)	5.3	5.3		5.5	5.5		5.6	5.6	5.6	5.8	5.8	
Lead/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	
Recall Mode	Max	Max		Max	Max		None	None	None	None	None	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	14.0	14.0		12.0	12.0		17.0	17.0	17.0	19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	27.9	27.9		27.7	27.7		7.5	7.5	7.5	7.4	7.4	
Actuated g/C Ratio	0.71	0.71		0.70	0.70		0.19	0.19	0.19	0.19	0.19	
v/c Ratio	0.03	0.31		0.19	0.35		0.14	0.10	0.16	0.15	0.12	
Control Delay	5.1	4.9		6.5	5.2		14.0	13.3	6.3	14.3	11.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	5.1	4.9		6.5	5.2		14.0	13.3	6.3	14.3	11.4	
LOS	A	A		A	A		B	B	A	B	B	
Approach Delay		4.9			5.3			10.5			12.9	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	1	40		9	48		7	6	0	8	5	
Queue Length 95th (ft)	6	74		30	87		23	20	18	25	20	
Internal Link Dist (ft)		409			486			535			446	
Turn Bay Length (ft)	140			92			100		100	100		
Base Capacity (vph)	427	2367		470	2353		887	1088	945	918	1036	
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	0.03	0.31		0.19	0.35		0.04	0.03	0.06	0.05	0.04	
Intersection Summary												
Area Type:	Other											
Cycle Length: 55												
Actuated Cycle Length: 39.3												
Natural Cycle: 55												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.35												
Intersection Signal Delay: 5.8						Intersection LOS: A						
Intersection Capacity Utilization 57.7%						ICU Level of Service B						
Analysis Period (min) 15												

Splits and Phases: 24: 6th St & 13th Ave



Lanes, Volumes, Timings

29: 14th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	515	35	55	645	95	60	25	75	85	30	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	285		0	175		213	0		0	0		0
Storage Lanes	1		0	1		1	0		1	1		0
Taper Length (ft)	120			100			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990				0.850			0.850		0.910	
Flt Protected	0.950			0.950				0.966		0.950		
Satd. Flow (prot)	1644	3256	0	1629	3257	1457	0	1688	1485	1569	1503	0
Flt Permitted	0.353			0.388				0.739		0.465		
Satd. Flow (perm)	611	3256	0	665	3257	1457	0	1291	1485	768	1503	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				103			82		49	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		935			658			457			346	
Travel Time (s)		18.2			12.8			10.4			7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	9%	9%	9%
Adj. Flow (vph)	43	560	38	60	701	103	65	27	82	92	33	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	598	0	60	701	103	0	92	82	92	82	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		6	4		4	8		

Lanes, Volumes, Timings

29: 14th St

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	4	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	7.0	7.0	7.0	4.0	7.0	
Minimum Split (s)	9.7	24.3		9.5	26.5	26.5	39.3	39.3	39.3	8.0	38.1	
Total Split (s)	9.7	28.1		9.6	28.0	28.0	39.3	39.3	39.3	8.0	47.3	
Total Split (%)	11.4%	33.1%		11.3%	32.9%	32.9%	46.2%	46.2%	46.2%	9.4%	55.6%	
Maximum Green (s)	5.0	22.8		5.1	22.5	22.5	33.0	33.0	33.0	4.0	41.2	
Yellow Time (s)	3.0	3.6		3.0	3.6	3.6	3.2	3.2	3.2	3.5	3.2	
All-Red Time (s)	1.7	1.7		1.5	1.9	1.9	3.1	3.1	3.1	0.5	2.9	
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)	4.7	5.3		4.5	5.5	5.5		6.3	6.3	4.0	6.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	
Walk Time (s)		5.0			5.0	5.0	5.0	5.0	5.0		5.0	
Flash Dont Walk (s)		14.0			16.0	16.0	28.0	28.0	28.0		27.0	
Pedestrian Calls (#/hr)		0			0	0	0	0	0		0	
Act Effect Green (s)	30.6	28.7		31.7	30.3	30.3		9.6	9.6	16.7	15.9	
Actuated g/C Ratio	0.54	0.51		0.56	0.54	0.54		0.17	0.17	0.30	0.28	
v/c Ratio	0.10	0.36		0.13	0.40	0.12		0.42	0.26	0.32	0.18	
Control Delay	8.5	14.1		8.5	13.6	4.3		29.1	8.5	17.6	9.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	8.5	14.1		8.5	13.6	4.3		29.1	8.5	17.6	9.5	
LOS	A	B		A	B	A		C	A	B	A	
Approach Delay		13.7			12.2			19.4			13.8	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)	7	85		10	75	0		32	0	24	9	
Queue Length 95th (ft)	22	141		28	173	28		70	31	53	36	
Internal Link Dist (ft)		855			578			377			266	
Turn Bay Length (ft)	285			175		213						
Base Capacity (vph)	424	1655		461	1742	827		771	920	285	1134	
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	0.10	0.36		0.13	0.40	0.12		0.12	0.09	0.32	0.07	

Intersection Summary

Area Type: Other

Cycle Length: 85

Actuated Cycle Length: 56.6

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 13.5

Intersection LOS: B

Intersection Capacity Utilization 48.3%

ICU Level of Service A

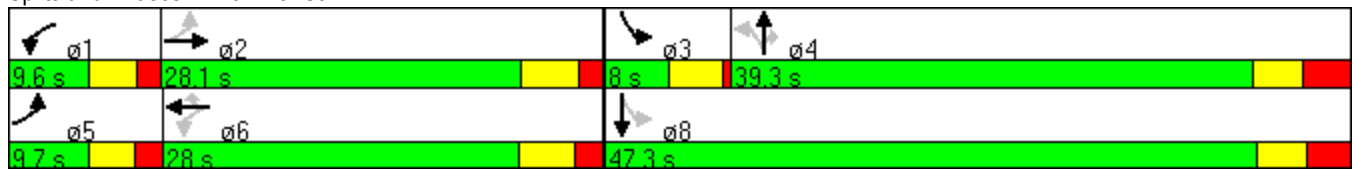
Analysis Period (min) 15

Lanes, Volumes, Timings

29: 14th St

9/14/2018

Splits and Phases: 29: 14th St



Intersection

Intersection Delay (sec/veh): 8.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	15	745	15	55	820	5	30	5	50	35	10	50
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	130		0	150		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	16	810	16	60	891	5	33	5	54	38	11	54
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	897	0	0	826	0	0	1422	1867	413	1454	1873	448
Stage 1	0	0	0	0	0	0	851	851	0	1014	1014	0
Stage 2	0	0	0	0	0	0	571	1016	0	440	859	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	752	-	-	801	-	-	96	72	588	91	71	558
Stage 1	-	-	-	-	-	-	321	375	-	256	314	-
Stage 2	-	-	-	-	-	-	473	314	-	566	371	-
Mov Capacity-1 Maneuver	752	-	-	801	-	-	70	65.1	588	71.7	64.2	558
Mov Capacity-2 Maneuver	-	-	-	-	-	-	70	65.1	-	71.7	64.2	-
Stage 1	-	-	-	-	-	-	321	366.8	-	256	290.5	-
Stage 2	-	-	-	-	-	-	380.1	290.5	-	494.9	362.8	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.2	0.6	66.5	96.1
HCM LOS	A	A	F	F

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	144							130
HCM Control Delay (s)	66.5	9.893	-	-	9.857	-	-	96.1
HCM Lane VC Ratio	0.642	0.022	-	-	0.075	-	-	0.794
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th Percentile Queue (veh)	3.486	0.066	-	-	0.241	-	-	4.772

Intersection

Intersection Delay (sec/veh): 1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	310	20	65	260	10	20
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	12			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	337	22	71	283	11	22
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	359	0	772	348
Stage 1	0	0	0	0	348	0
Stage 2	0	0	0	0	424	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1200	-	368	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	660	-
Mov Capacity-1 Maneuver	-	-	1200	-	346.3	695
Mov Capacity-2 Maneuver	-	-	-	-	346.3	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	621.1	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	1.6	12.4
HCM LOS	A	A	B

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	520				
HCM Control Delay (s)	12.4	-	-	8.188	0
HCM Lane VC Ratio	0.063	0	-	0.059	-
HCM Lane LOS	B	-	-	A	-
HCM 95th Percentile Queue (veh)	0.2	0	-	0.187	-

Intersection

Intersection Delay (s) 12140579006527E-314

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	20	305	5	55	290	185	5	15	30	140	70	30
Conflicting Peds. (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	215		0	190		0	0		0	60		0
Median Width		12			12			12			12	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	22	332	5	60	315	201	5	16	33	152	76	33
Number of Lanes	1	1	0	1	1	0	0	1	0	1	1	0

Major/Minor

Lane

Conflicting Flow Rate - All	Capacity (vph)
Stage 1	HCM Control Delay (s)
Stage 2	HCM Lane VC Ratio
Follow-up Headway	HCM Lane LOS
Pot Capacity-1 Maneuver	HCM 95th Percentile Queue (veh)
Stage 1	
Stage 2	
Mov Capacity-1 Maneuver	
Mov Capacity-2 Maneuver	
Stage 1	
Stage 2	

Approach

HCM Control Delay (s)
HCM LOS

Intersection

Intersection Delay (sec/veh): 9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	20	560	5	30	640	40	5	25	20	40	50	25
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	100		0	100		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	22	609	5	33	696	43	5	27	22	43	54	27
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	739	0	0	614	0	0	1095	1459	307	1144	1441	370
Stage 1	0	0	0	0	0	0	655	655	0	783	783	0
Stage 2	0	0	0	0	0	0	440	804	0	361	658	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	863	-	-	961	-	-	168	128	689	155	131	628
Stage 1	-	-	-	-	-	-	421	461	-	353	403	-
Stage 2	-	-	-	-	-	-	566	394	-	630	459	-
Mov Capacity-1 Maneuver	863	-	-	961	-	-	101.1	120.6	689	118.8	123.4	628
Mov Capacity-2 Maneuver	-	-	-	-	-	-	101.1	120.6	-	118.8	123.4	-
Stage 1	-	-	-	-	-	-	421	449.5	-	353	389.3	-
Stage 2	-	-	-	-	-	-	450.1	380.6	-	558.9	447.5	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.3	0.4	34.6	98.3
HCM LOS	A	A	D	F

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	175							147
HCM Control Delay (s)	34.6	9.279	-	-	8.878	-	-	98.3
HCM Lane VC Ratio	0.311	0.025	-	-	0.034	-	-	0.85
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th Percentile Queue (veh)	1.248	0.077	-	-	0.105	-	-	5.608

Intersection

Intersection Delay (sec/veh): 6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	35	600	40	140	760	40	5	10	50	20	15	30
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	200		0	180		0	0		0	0		0
Median Width		12			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	38	652	43	152	826	43	5	11	54	22	16	33
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	1

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	870	0	0	696	0	0	1476	1924	348	1560	1924	435
Stage 1	0	0	0	0	0	0	750	750	0	1152	1152	0
Stage 2	0	0	0	0	0	0	726	1174	0	408	772	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	770	-	-	896	-	-	88	66	648	76	66	569
Stage 1	-	-	-	-	-	-	369	417	-	210	270	-
Stage 2	-	-	-	-	-	-	382	264	-	591	407	-
Mov Capacity-1 Maneuver	770	-	-	896	-	-	53.2	52.1	648	49.3	52.1	569
Mov Capacity-2 Maneuver	-	-	-	-	-	-	53.2	52.1	-	49.3	52.1	-
Stage 1	-	-	-	-	-	-	369	396.6	-	210	224.1	-
Stage 2	-	-	-	-	-	-	277.1	219.1	-	500.8	387.1	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.5	1.5	37.6	107.277
HCM LOS	A	A	E	F

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (vph)	179							50	569
HCM Control Delay (s)	37.6	9.918	-	-	9.838	-	-	189.2	11.7
HCM Lane VC Ratio	0.395	0.049	-	-	0.17	-	-	0.761	0.057
HCM Lane LOS	E	A	-	-	A	-	-	F	B
HCM 95th Percentile Queue (veh)	1.734	0.156	-	-	0.61	-	-	3.103	0.182

Intersection												
Intersection Delay (sec/veh)	23.1											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	20	305	5	55	290	185	5	15	30	140	70	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	22	332	5	60	315	201	5	16	33	152	76	33
Number of Lanes	1	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	18.4	31.5	11.7	13.2
HCM LOS	C	D	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Volume Left (%)	10%	100%	0%	100%	0%	100%	0%
Volume Thru (%)	30%	0%	98%	0%	61%	0%	70%
Volume Right (%)	60%	0%	2%	0%	39%	0%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume by Lane	50	20	310	55	475	140	100
Left Turning Volume	15	0	305	0	290	0	70
Through Volume	30	0	5	0	185	0	30
Right Turning Volume	5	20	0	55	0	140	0
Lane Flow Rate	54	22	337	60	516	152	109
Geometry Group	6	7	7	7	7	7	7
Degree of Utilization, X	0.116	0.042	0.606	0.112	0.852	0.327	0.211
Departure Headway, Hd	7.674	6.997	6.476	6.725	5.94	7.826	7
Convergence(Y/N)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Capacity	470	508	553	530	604	463	509
Service Time	5.674	4.793	4.272	4.509	3.723	5.526	4.8
HCM Lane V/C Ratio	0.115	0.043	0.609	0.113	0.854	0.328	0.214
HCM Control Delay	11.7	10.1	18.9	10.4	33.9	14.3	11.7
HCM Lane LOS	B	B	C	B	D	B	B
HCM 95th Percentile Queue	0.4	0.1	4.6	0.4	16.8	1.5	0.8

Lanes, Volumes, Timings
5: 15th & Main Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	465	175	60	510	30	125	155	15	120	195	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959			0.992			0.987				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1613	3094	0	1613	3201	0	1613	1676	0	1613	1698	1443
Flt Permitted	0.239			0.387			0.562			0.620		
Satd. Flow (perm)	406	3094	0	657	3201	0	954	1676	0	1053	1698	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			7			7				296
Link Speed (mph)		30			30			25				25
Link Distance (ft)		769			603			1224				442
Travel Time (s)		17.5			13.7			33.4				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	261	505	190	65	554	33	136	168	16	130	212	429
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	695	0	65	587	0	136	184	0	130	212	429
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6

Lanes, Volumes, Timings

5: 15th & Main Ave

9/14/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.5	21.5		9.5	21.5		9.5	27.5		9.5	27.5	27.5
Total Split (s)	15.0	26.9		9.6	21.5		9.6	28.9		9.6	28.9	28.9
Total Split (%)	20.0%	35.9%		12.8%	28.7%		12.8%	38.5%		12.8%	38.5%	38.5%
Maximum Green (s)	9.5	21.4		4.1	16.0		4.1	23.4		4.1	23.4	23.4
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	2.5
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)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	30.6	25.4		19.4	15.1		18.3	15.2		18.3	15.2	15.2
Actuated g/C Ratio	0.48	0.39		0.30	0.23		0.28	0.24		0.28	0.24	0.24
v/c Ratio	0.69	0.55		0.25	0.77		0.43	0.46		0.39	0.53	0.76
Control Delay	26.2	18.9		15.5	33.2		19.7	24.6		18.5	27.0	17.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.2	18.9		15.5	33.2		19.7	24.6		18.5	27.0	17.1
LOS	C	B		B	C		B	C		B	C	B
Approach Delay		20.9			31.4			22.5			20.1	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	65	113		14	116		37	63		35	77	46
Queue Length 95th (ft)	#177	199		41	#224		71	115		69	135	143
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200			200			200		
Base Capacity (vph)	377	1266		260	828		314	634		336	638	727
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	0.69	0.55		0.25	0.71		0.43	0.29		0.39	0.33	0.59

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 64.4

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 23.4

Intersection LOS: C

Intersection Capacity Utilization 66.4%

ICU Level of Service C

Analysis Period (min) 15

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

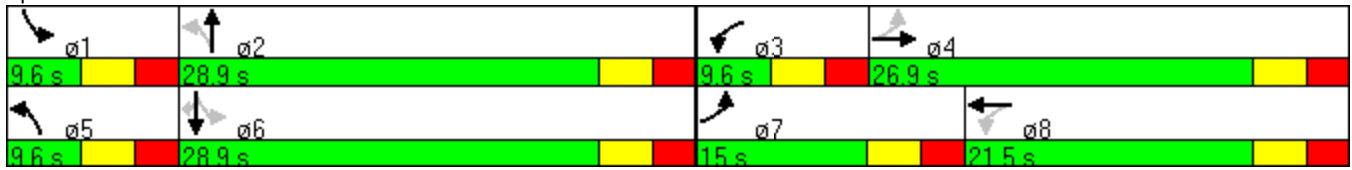
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

5: 15th & Main Ave

9/14/2018

Splits and Phases: 5: 15th & Main Ave



Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	505	95	15	275	70	120	85	25	45	85	210
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.970				0.850		0.917	
Flt Protected	0.950			0.950				0.972			0.993	
Satd. Flow (prot)	1613	3149	0	1613	3130	0	0	1651	1443	0	1546	0
Flt Permitted	0.397			0.404				0.554			0.923	
Satd. Flow (perm)	674	3149	0	686	3130	0	0	941	1443	0	1437	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			51				27		153	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		769			603			1224			442	
Travel Time (s)		17.5			13.7			33.4			12.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	245	549	103	16	299	76	130	92	27	49	92	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	652	0	16	375	0	0	222	27	0	369	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		

Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	21.5		9.5	21.5		27.5	27.5	27.5	27.5	27.5	
Total Split (s)	11.0	23.0		9.5	21.5		27.5	27.5	27.5	27.5	27.5	
Total Split (%)	18.3%	38.3%		15.8%	35.8%		45.8%	45.8%	45.8%	45.8%	45.8%	
Maximum Green (s)	5.5	17.5		4.0	16.0		22.0	22.0	22.0	22.0	22.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		17.0	17.0	17.0	17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	21.4	20.5		14.8	10.7			15.3	15.3		15.3	
Actuated g/C Ratio	0.44	0.42		0.30	0.22			0.31	0.31		0.31	
v/c Ratio	0.60	0.48		0.06	0.52			0.75	0.06		0.66	
Control Delay	19.7	13.1		9.9	17.7			33.0	5.9		14.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	19.7	13.1		9.9	17.7			33.0	5.9		14.9	
LOS	B	B		A	B			C	A		B	
Approach Delay		14.9			17.4			30.1			14.9	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	42	58		2	42			53	0		47	
Queue Length 95th (ft)	#125	154		12	84			#155	13		134	
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200					160			
Base Capacity (vph)	406	1347		287	1095			439	687		752	
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	0.60	0.48		0.06	0.34			0.51	0.04		0.49	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 48.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 17.4

Intersection LOS: B

Intersection Capacity Utilization 74.3%

ICU Level of Service D

Analysis Period (min) 15

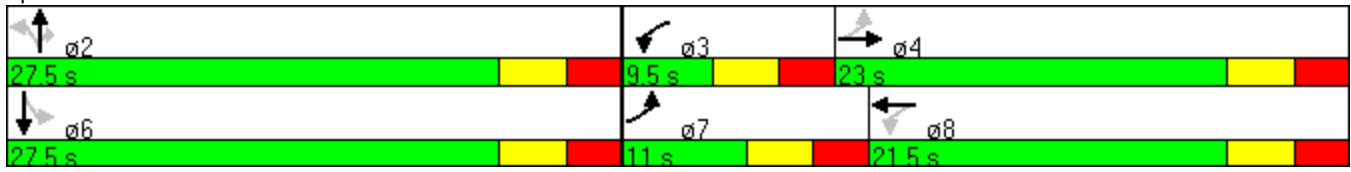
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

11/28/2018

Splits and Phases: 5: Main Ave & CR 28 / 15th St



Intersection

Intersection Delay (sec/veh): 1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	215	5	10	185	15	70
Conflicting Peds. (#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	12			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	234	5	11	201	16	76
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	239	0	459	236
Stage 1	0	0	0	0	236	0
Stage 2	0	0	0	0	223	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1329	-	560	801
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	814	-
Mov Capacity-1 Maneuver	-	-	1329	-	555.5	801
Mov Capacity-2 Maneuver	-	-	-	-	555.5	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	807.5	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	0.4	10.5
HCM LOS	A	A	B

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	743				
HCM Control Delay (s)	10.5	-	-	7.731	0
HCM Lane VC Ratio	0.124	0	-	0.008	-
HCM Lane LOS	B	-	-	A	-
HCM 95th Percentile Queue (veh)	0.424	0	-	0.025	-

Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	465	175	60	510	30	125	155	15	120	195	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959			0.992				0.850		0.925	
Flt Protected	0.950			0.950				0.978			0.992	
Satd. Flow (prot)	1613	3094	0	1613	3201	0	0	1661	1443	0	1558	0
Flt Permitted	0.180			0.290				0.494			0.845	
Satd. Flow (perm)	306	3094	0	492	3201	0	0	839	1443	0	1327	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65			7				16		110	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		769			603			1224			442	
Travel Time (s)		17.5			13.7			33.4			12.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	261	505	190	65	554	33	136	168	16	130	212	429
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	695	0	65	587	0	0	304	16	0	771	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		

Lanes, Volumes, Timings
5: Main Ave & CR 28 / 15th St

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	21.5		9.5	21.5		27.5	27.5	27.5	27.5	27.5	
Total Split (s)	14.0	25.9		9.6	21.5		44.5	44.5	44.5	44.5	44.5	
Total Split (%)	17.5%	32.4%		12.0%	26.9%		55.6%	55.6%	55.6%	55.6%	55.6%	
Maximum Green (s)	8.5	20.4		4.1	16.0		39.0	39.0	39.0	39.0	39.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5			5.5	5.5		5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Walk Time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		17.0	17.0	17.0	17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	29.1	22.3		20.1	16.0			39.0	39.0		39.0	
Actuated g/C Ratio	0.36	0.28		0.25	0.20			0.49	0.49		0.49	
v/c Ratio	1.04	0.76		0.36	0.91			0.74	0.02		1.10	
Control Delay	93.8	31.5		23.2	51.6			30.3	5.3		83.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	93.8	31.5		23.2	51.6			30.3	5.3		83.8	
LOS	F	C		C	D			C	A		F	
Approach Delay		48.5			48.7			29.0			83.8	
Approach LOS		D			D			C			F	
Queue Length 50th (ft)	~101	157		21	150			116	0		~414	
Queue Length 95th (ft)	#246	#246		47	#248			#255	9		#628	
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200					160			
Base Capacity (vph)	250	909		181	646			409	712		703	
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	1.04	0.76		0.36	0.91			0.74	0.02		1.10	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 56.3

Intersection LOS: E

Intersection Capacity Utilization 107.6%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings 5: Main Ave & CR 28 / 15th St

11/28/2018

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Main Ave & CR 28 / 15th St



Intersection

Intersection Delay (sec/veh): 1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	310	20	65	260	10	20
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	12			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	337	22	71	283	11	22
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	359	0	772	348
Stage 1	0	0	0	0	348	0
Stage 2	0	0	0	0	424	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1200	-	368	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	660	-
Mov Capacity-1 Maneuver	-	-	1200	-	346.3	695
Mov Capacity-2 Maneuver	-	-	-	-	346.3	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	621.1	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	1.6	12.4
HCM LOS	A	A	B

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	520				
HCM Control Delay (s)	12.4	-	-	8.188	0
HCM Lane VC Ratio	0.063	0	-	0.059	-
HCM Lane LOS	B	-	-	A	-
HCM 95th Percentile Queue (veh)	0.2	0	-	0.187	-

Lanes, Volumes, Timings
5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	505	95	15	275	70	120	85	25	45	85	210
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.970			0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1613	3149	0	1613	3130	0	1613	1640	0	1613	1698	1443
Flt Permitted	0.401			0.404			0.607			0.681		
Satd. Flow (perm)	681	3149	0	686	3130	0	1031	1640	0	1156	1698	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			42			22				228
Link Speed (mph)		30			30			25				25
Link Distance (ft)		769			603			1224				442
Travel Time (s)		17.5			13.7			33.4				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	245	549	103	16	299	76	130	92	27	49	92	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	652	0	16	375	0	130	119	0	49	92	228
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6

Lanes, Volumes, Timings

5: 15th & Main Ave

11/28/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.5	21.5		9.5	21.5		9.5	27.5		9.5	27.5	27.5
Total Split (s)	11.0	23.0		9.5	21.5		9.5	28.0		9.5	28.0	28.0
Total Split (%)	15.7%	32.9%		13.6%	30.7%		13.6%	40.0%		13.6%	40.0%	40.0%
Maximum Green (s)	5.5	17.5		4.0	16.0		4.0	22.5		4.0	22.5	22.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	2.5
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)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		None	None		None	None	None
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	21.6	20.7		15.0	10.8		13.8	12.4		11.5	8.5	8.5
Actuated g/C Ratio	0.44	0.42		0.30	0.22		0.28	0.25		0.23	0.17	0.17
v/c Ratio	0.60	0.49		0.06	0.52		0.39	0.28		0.16	0.31	0.52
Control Delay	20.0	13.6		9.9	18.6		17.0	16.7		13.3	22.4	8.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	20.0	13.6		9.9	18.6		17.0	16.7		13.3	22.4	8.3
LOS	C	B		A	B		B	B		B	C	A
Approach Delay		15.3			18.2			16.9			12.5	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)	45	64		3	45		26	19		9	24	0
Queue Length 95th (ft)	#127	157		12	87		65	69		30	63	48
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200			200			200		
Base Capacity (vph)	406	1337		286	1081		337	787		309	803	803
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	0.60	0.49		0.06	0.35		0.39	0.15		0.16	0.11	0.28

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 49.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 15.6

Intersection LOS: B

Intersection Capacity Utilization 51.0%

ICU Level of Service A

Analysis Period (min) 15

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

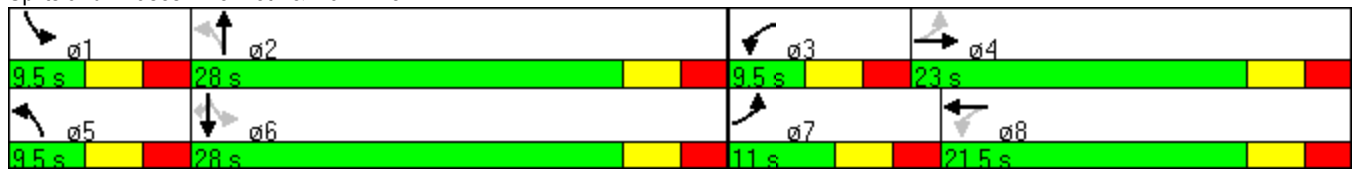
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

5: 15th & Main Ave

11/28/2018

Splits and Phases: 5: 15th & Main Ave



Intersection

Intersection Delay (sec/veh): 1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	215	5	10	185	15	70
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	0			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	234	5	11	201	16	76
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	239	0	459	236
Stage 1	0	0	0	0	236	0
Stage 2	0	0	0	0	223	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1329	-	560	801
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	814	-
Mov Capacity-1 Maneuver	-	-	1329	-	555.5	801
Mov Capacity-2 Maneuver	-	-	-	-	555.5	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	807.5	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	0.4	10.5
HCM LOS	A	A	B

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	743				
HCM Control Delay (s)	10.5	-	-	7.731	0
HCM Lane VC Ratio	0.124	0	-	0.008	-
HCM Lane LOS	B	-	-	A	-
HCM 95th Percentile Queue (veh)	0.424	0	-	0.025	-

Lanes, Volumes, Timings
5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	465	175	60	510	30	125	155	15	120	195	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959			0.992			0.987				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1613	3094	0	1613	3201	0	1613	1676	0	1613	1698	1443
Flt Permitted	0.239			0.387			0.562			0.620		
Satd. Flow (perm)	406	3094	0	657	3201	0	954	1676	0	1053	1698	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			7			7				296
Link Speed (mph)		30			30			25				25
Link Distance (ft)		769			603			1224				442
Travel Time (s)		17.5			13.7			33.4				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	261	505	190	65	554	33	136	168	16	130	212	429
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	695	0	65	587	0	136	184	0	130	212	429
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6

Lanes, Volumes, Timings
5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.5	21.5		9.5	21.5		9.5	27.5		9.5	27.5	27.5
Total Split (s)	15.0	26.9		9.6	21.5		9.6	28.9		9.6	28.9	28.9
Total Split (%)	20.0%	35.9%		12.8%	28.7%		12.8%	38.5%		12.8%	38.5%	38.5%
Maximum Green (s)	9.5	21.4		4.1	16.0		4.1	23.4		4.1	23.4	23.4
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	2.5
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)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	30.6	25.4		19.4	15.1		18.3	15.2		18.3	15.2	15.2
Actuated g/C Ratio	0.48	0.39		0.30	0.23		0.28	0.24		0.28	0.24	0.24
v/c Ratio	0.69	0.55		0.25	0.77		0.43	0.46		0.39	0.53	0.76
Control Delay	26.2	18.9		15.5	33.2		19.7	24.6		18.5	27.0	17.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.2	18.9		15.5	33.2		19.7	24.6		18.5	27.0	17.1
LOS	C	B		B	C		B	C		B	C	B
Approach Delay		20.9			31.4			22.5			20.1	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	65	113		14	116		37	63		35	77	46
Queue Length 95th (ft)	#177	199		41	#224		71	115		69	135	143
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200			200			200		
Base Capacity (vph)	377	1266		260	828		314	634		336	638	727
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	0.69	0.55		0.25	0.71		0.43	0.29		0.39	0.33	0.59

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 64.4

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 23.4

Intersection LOS: C

Intersection Capacity Utilization 66.4%

ICU Level of Service C

Analysis Period (min) 15

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

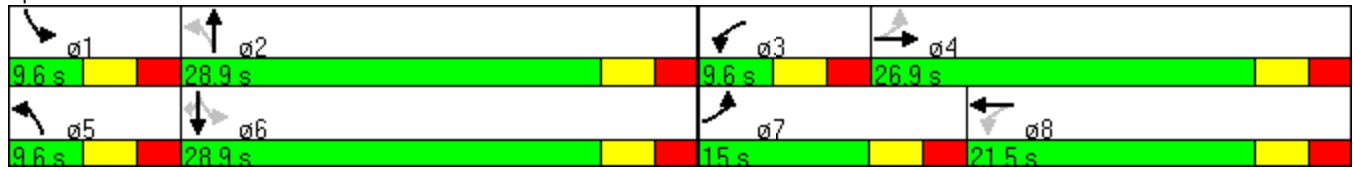
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

5: 15th & Main Ave

11/28/2018

Splits and Phases: 5: 15th & Main Ave



Intersection

Intersection Delay (sec/veh): 1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	310	20	65	260	10	20
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	0			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	337	22	71	283	11	22
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	359	0	772	348
Stage 1	0	0	0	0	348	0
Stage 2	0	0	0	0	424	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1200	-	368	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	660	-
Mov Capacity-1 Maneuver	-	-	1200	-	346.3	695
Mov Capacity-2 Maneuver	-	-	-	-	346.3	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	621.1	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	1.6	12.4
HCM LOS	A	A	B

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	520				
HCM Control Delay (s)	12.4	-	-	8.188	0
HCM Lane VC Ratio	0.063	0	-	0.059	-
HCM Lane LOS	B	-	-	A	-
HCM 95th Percentile Queue (veh)	0.2	0	-	0.187	-

Lanes, Volumes, Timings
5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	505	95	15	275	70	120	85	25	45	85	210
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.970			0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1613	3149	0	1613	3130	0	1613	1640	0	1613	1698	1443
Flt Permitted	0.401			0.404			0.607			0.681		
Satd. Flow (perm)	681	3149	0	686	3130	0	1031	1640	0	1156	1698	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			42			22				228
Link Speed (mph)		30			30			25				25
Link Distance (ft)		769			603			1224				442
Travel Time (s)		17.5			13.7			33.4				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	245	549	103	16	299	76	130	92	27	49	92	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	652	0	16	375	0	130	119	0	49	92	228
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			16			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6

Lanes, Volumes, Timings
5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.5	21.5		9.5	21.5		9.5	27.5		9.5	27.5	27.5
Total Split (s)	11.0	23.0		9.5	21.5		9.5	28.0		9.5	28.0	28.0
Total Split (%)	15.7%	32.9%		13.6%	30.7%		13.6%	40.0%		13.6%	40.0%	40.0%
Maximum Green (s)	5.5	17.5		4.0	16.0		4.0	22.5		4.0	22.5	22.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	2.5
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)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		None	None		None	None	None
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	21.6	20.7		15.0	10.8		13.8	12.4		11.5	8.5	8.5
Actuated g/C Ratio	0.44	0.42		0.30	0.22		0.28	0.25		0.23	0.17	0.17
v/c Ratio	0.60	0.49		0.06	0.52		0.39	0.28		0.16	0.31	0.52
Control Delay	20.0	13.6		9.9	18.6		17.0	16.7		13.3	22.4	8.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	20.0	13.6		9.9	18.6		17.0	16.7		13.3	22.4	8.3
LOS	C	B		A	B		B	B		B	C	A
Approach Delay		15.3			18.2			16.9			12.5	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)	45	64		3	45		26	19		9	24	0
Queue Length 95th (ft)	#127	157		12	87		65	69		30	63	48
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200			200			200		
Base Capacity (vph)	406	1337		286	1081		337	787		309	803	803
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	0.60	0.49		0.06	0.35		0.39	0.15		0.16	0.11	0.28

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 49.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 15.6

Intersection LOS: B

Intersection Capacity Utilization 51.0%

ICU Level of Service A

Analysis Period (min) 15

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

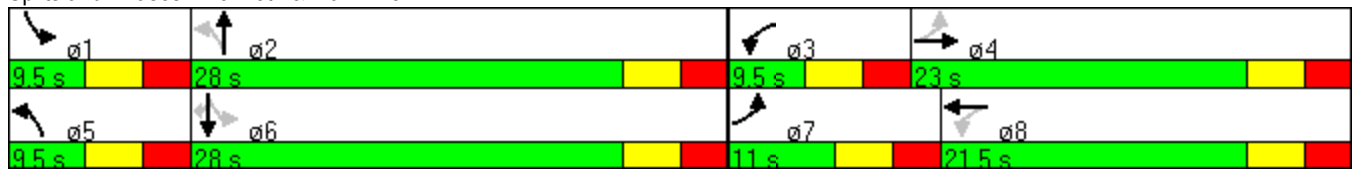
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

5: 15th & Main Ave

11/28/2018

Splits and Phases: 5: 15th & Main Ave



Intersection

Intersection Delay (sec/veh): 1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	215	5	10	185	15	70
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	16			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	234	5	11	201	16	76
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	239	0	459	236
Stage 1	0	0	0	0	236	0
Stage 2	0	0	0	0	223	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1329	-	560	801
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	814	-
Mov Capacity-1 Maneuver	-	-	1329	-	555.5	801
Mov Capacity-2 Maneuver	-	-	-	-	555.5	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	807.5	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	0.4	10.5
HCM LOS	A	A	B

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	743				
HCM Control Delay (s)	10.5	-	-	7.731	0
HCM Lane VC Ratio	0.124	0	-	0.008	-
HCM Lane LOS	B	-	-	A	-
HCM 95th Percentile Queue (veh)	0.424	0	-	0.025	-

Lanes, Volumes, Timings
5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	505	95	15	275	70	120	85	25	45	85	210
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.970			0.966				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1613	3149	0	1613	3130	0	1613	1640	0	1613	1698	1443
Flt Permitted	0.401			0.404			0.607			0.681		
Satd. Flow (perm)	681	3149	0	686	3130	0	1031	1640	0	1156	1698	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			42			22				228
Link Speed (mph)		30			30			25				25
Link Distance (ft)		769			603			1224				442
Travel Time (s)		17.5			13.7			33.4				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	245	549	103	16	299	76	130	92	27	49	92	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	652	0	16	375	0	130	119	0	49	92	228
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			16			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6

Lanes, Volumes, Timings

5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.5	21.5		9.5	21.5		9.5	27.5		9.5	27.5	27.5
Total Split (s)	11.0	23.0		9.5	21.5		9.5	28.0		9.5	28.0	28.0
Total Split (%)	15.7%	32.9%		13.6%	30.7%		13.6%	40.0%		13.6%	40.0%	40.0%
Maximum Green (s)	5.5	17.5		4.0	16.0		4.0	22.5		4.0	22.5	22.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	2.5
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)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		None	None		None	None	None
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	21.6	20.7		15.0	10.8		13.8	12.4		11.5	8.5	8.5
Actuated g/C Ratio	0.44	0.42		0.30	0.22		0.28	0.25		0.23	0.17	0.17
v/c Ratio	0.60	0.49		0.06	0.52		0.39	0.28		0.16	0.31	0.52
Control Delay	20.0	13.6		9.9	18.6		17.0	16.7		13.3	22.4	8.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	20.0	13.6		9.9	18.6		17.0	16.7		13.3	22.4	8.3
LOS	C	B		A	B		B	B		B	C	A
Approach Delay		15.3			18.2			16.9			12.5	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)	45	64		3	45		26	19		9	24	0
Queue Length 95th (ft)	#127	157		12	87		65	69		30	63	48
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200			200			200		
Base Capacity (vph)	406	1337		286	1081		337	787		309	803	803
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	0.60	0.49		0.06	0.35		0.39	0.15		0.16	0.11	0.28

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 49.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 15.6

Intersection LOS: B

Intersection Capacity Utilization 51.0%

ICU Level of Service A

Analysis Period (min) 15

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

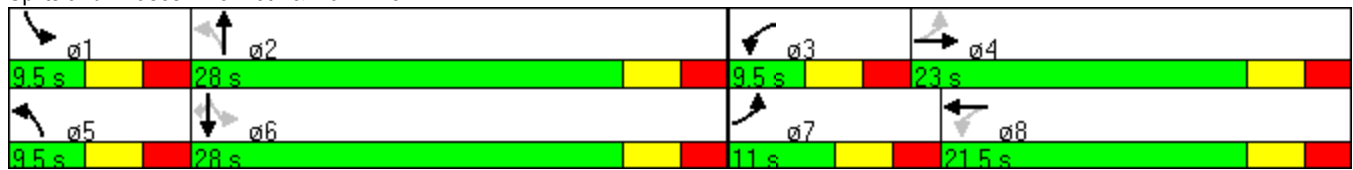
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

5: 15th & Main Ave

11/28/2018

Splits and Phases: 5: 15th & Main Ave



Intersection						
Intersection Delay (sec/veh): 1.9						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	215	5	10	185	15	70
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	16			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	234	5	11	201	16	76
Number of Lanes	1	0	0	1	1	0
Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	239	0	459	236
Stage 1	0	0	0	0	236	0
Stage 2	0	0	0	0	223	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1329	-	560	801
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	814	-
Mov Capacity-1 Maneuver	-	-	1329	-	555.5	801
Mov Capacity-2 Maneuver	-	-	-	-	555.5	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	807.5	-
Approach	EB		WB		NB	
HCM Control Delay (s)	0		0.4		10.5	
HCM LOS	A		A		B	
Lane	NBLn1	EBT	EBR	WBL	WBT	
Capacity (vph)	743					
HCM Control Delay (s)	10.5	-	-	7.731	0	
HCM Lane VC Ratio	0.124	0	-	0.008	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th Percentile Queue (veh)	0.424	0	-	0.025	-	

Lanes, Volumes, Timings
5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	465	175	60	510	30	125	155	15	120	195	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	200		0	200		0	200		160	200		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959			0.992			0.987				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1613	3094	0	1613	3201	0	1613	1676	0	1613	1698	1443
Flt Permitted	0.239			0.387			0.562			0.620		
Satd. Flow (perm)	406	3094	0	657	3201	0	954	1676	0	1053	1698	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			7			7				296
Link Speed (mph)		30			30			25				25
Link Distance (ft)		769			603			1224				442
Travel Time (s)		17.5			13.7			33.4				12.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	261	505	190	65	554	33	136	168	16	130	212	429
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	695	0	65	587	0	136	184	0	130	212	429
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			16			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6

Lanes, Volumes, Timings
5: 15th & Main Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.5	21.5		9.5	21.5		9.5	27.5		9.5	27.5	27.5
Total Split (s)	15.0	26.9		9.6	21.5		9.6	28.9		9.6	28.9	28.9
Total Split (%)	20.0%	35.9%		12.8%	28.7%		12.8%	38.5%		12.8%	38.5%	38.5%
Maximum Green (s)	9.5	21.4		4.1	16.0		4.1	23.4		4.1	23.4	23.4
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	2.5
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)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)		5.0			5.0			5.0			5.0	5.0
Flash Dont Walk (s)		11.0			11.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	30.6	25.4		19.4	15.1		18.3	15.2		18.3	15.2	15.2
Actuated g/C Ratio	0.48	0.39		0.30	0.23		0.28	0.24		0.28	0.24	0.24
v/c Ratio	0.69	0.55		0.25	0.77		0.43	0.46		0.39	0.53	0.76
Control Delay	26.2	18.9		15.5	33.2		19.7	24.6		18.5	27.0	17.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.2	18.9		15.5	33.2		19.7	24.6		18.5	27.0	17.1
LOS	C	B		B	C		B	C		B	C	B
Approach Delay		20.9			31.4			22.5			20.1	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	65	113		14	116		37	63		35	77	46
Queue Length 95th (ft)	#177	199		41	#224		71	115		69	135	143
Internal Link Dist (ft)		689			523			1144			362	
Turn Bay Length (ft)	200			200			200			200		
Base Capacity (vph)	377	1266		260	828		314	634		336	638	727
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	0.69	0.55		0.25	0.71		0.43	0.29		0.39	0.33	0.59

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 64.4

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 23.4

Intersection LOS: C

Intersection Capacity Utilization 66.4%

ICU Level of Service C

Analysis Period (min) 15

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

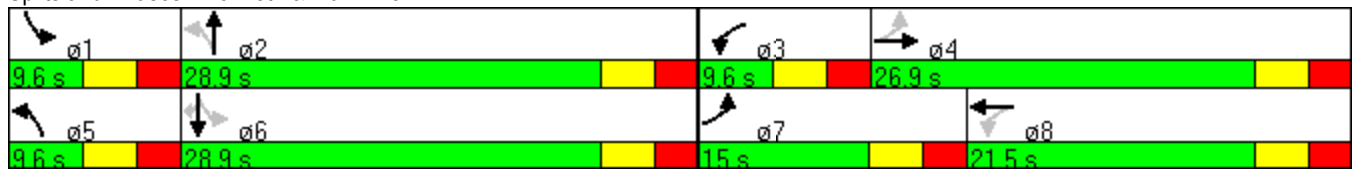
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

5: 15th & Main Ave

11/28/2018

Splits and Phases: 5: 15th & Main Ave



Intersection

Intersection Delay (sec/veh): 1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Volume (vph)	310	20	65	260	10	20
Conflicting Peds.(#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None
Storage Length		0	0		0	0
Median Width	16			12	12	
Grade (%)	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	337	22	71	283	11	22
Number of Lanes	1	0	0	1	1	0

Major/Minor	Major 1		Major 2			
Conflicting Flow Rate - All	0	0	359	0	772	348
Stage 1	0	0	0	0	348	0
Stage 2	0	0	0	0	424	0
Follow-up Headway	-	-	2.218	0	3.518	3.318
Pot Capacity-1 Maneuver	-	-	1200	-	368	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	660	-
Mov Capacity-1 Maneuver	-	-	1200	-	346.3	695
Mov Capacity-2 Maneuver	-	-	-	-	346.3	-
Stage 1	-	-	-	-	# 0	-
Stage 2	-	-	-	-	621.1	-

Approach	EB	WB	NB
HCM Control Delay (s)	0	1.6	12.4
HCM LOS	A	A	B

Lane	NBLn1	EBT	EBR	WBL	WBT
Capacity (vph)	520				
HCM Control Delay (s)	12.4	-	-	8.188	0
HCM Lane VC Ratio	0.063	0	-	0.059	-
HCM Lane LOS	B	-	-	A	-
HCM 95th Percentile Queue (veh)	0.2	0	-	0.187	-

HCM Unsignalized Intersection Capacity Analysis

36: 13th Ave & 15th

11/30/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	60	140	90	50	145	50
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	152	98	54	158	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						1224
pX, platoon unblocked						
vC, conflicting volume	467	98			152	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	467	98			152	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	84			89	
cM capacity (veh/h)	493	958			1429	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	65	152	98	54	158	54
Volume Left	65	0	0	0	158	0
Volume Right	0	152	0	54	0	0
cSH	493	958	1700	1700	1429	1700
Volume to Capacity	0.13	0.16	0.06	0.03	0.11	0.03
Queue Length 95th (ft)	11	14	0	0	9	0
Control Delay (s)	13.4	9.5	0.0	0.0	7.8	0.0
Lane LOS	B	A			A	
Approach Delay (s)	10.7		0.0		5.8	
Approach LOS	B					
Intersection Summary						
Average Delay			6.1			
Intersection Capacity Utilization			25.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

36: 13th Ave & 15th

11/30/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	55	180	115	50	280	150
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	196	125	54	304	163
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						1224
pX, platoon unblocked						
vC, conflicting volume	897	125			179	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	897	125			179	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	79			78	
cM capacity (veh/h)	243	926			1396	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	60	196	125	54	304	163
Volume Left	60	0	0	0	304	0
Volume Right	0	196	0	54	0	0
cSH	243	926	1700	1700	1396	1700
Volume to Capacity	0.25	0.21	0.07	0.03	0.22	0.10
Queue Length 95th (ft)	24	20	0	0	21	0
Control Delay (s)	24.6	9.9	0.0	0.0	8.3	0.0
Lane LOS	C	A			A	
Approach Delay (s)	13.4		0.0		5.4	
Approach LOS	B					
Intersection Summary						
Average Delay			6.6			
Intersection Capacity Utilization			33.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

36: 13th Ave & 15th

11/30/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	90	50	60	140	145	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	54	65	152	158	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	217				315	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	217				315	65
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				75	95
cM capacity (veh/h)	1352				629	999
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	98	54	65	152	158	54
Volume Left	98	0	0	0	158	0
Volume Right	0	0	0	152	0	54
cSH	1352	1700	1700	1700	629	999
Volume to Capacity	0.07	0.03	0.04	0.09	0.25	0.05
Queue Length 95th (ft)	6	0	0	0	25	4
Control Delay (s)	7.9	0.0	0.0	0.0	12.6	8.8
Lane LOS	A				B	A
Approach Delay (s)	5.1		0.0		11.7	
Approach LOS					B	
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utilization			27.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

36: 13th Ave & 15th

11/30/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	115	50	55	180	280	150
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	54	60	196	304	163
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	255				364	60
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	255				364	60
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				47	84
cM capacity (veh/h)	1310				575	1006
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	125	54	60	196	304	163
Volume Left	125	0	0	0	304	0
Volume Right	0	0	0	196	0	163
cSH	1310	1700	1700	1700	575	1006
Volume to Capacity	0.10	0.03	0.04	0.12	0.53	0.16
Queue Length 95th (ft)	8	0	0	0	77	14
Control Delay (s)	8.0	0.0	0.0	0.0	18.1	9.3
Lane LOS	A				C	A
Approach Delay (s)	5.6		0.0		15.0	
Approach LOS					C	
Intersection Summary						
Average Delay			8.9			
Intersection Capacity Utilization			36.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	335	180	95	150	80	165	410	280	85	245	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	240		200	415		0	230		230	132		0
Storage Lanes	1		1	1		1	1		1	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
Frt			0.850			0.850			0.850		0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1660	1748	1485	1644	1731	1471	1676	1765	1500	1644	1712	0
Flt Permitted	0.654			0.350			0.441			0.294		
Satd. Flow (perm)	1143	1748	1485	606	1731	1471	778	1765	1500	509	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			196			87			304		6	
Link Speed (mph)		25			35			30			25	
Link Distance (ft)		646			849			723			965	
Travel Time (s)		17.6			16.5			16.4			26.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	38	364	196	103	163	87	179	446	304	92	266	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	364	196	103	163	87	179	446	304	92	288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		

Lanes, Volumes, Timings

22: Sheyenne St & 13th Ave

11/28/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	9.6	23.7	23.7	9.5	23.3	23.3	9.5	27.6	27.6	9.6	26.9	
Total Split (s)	9.6	26.7	26.7	9.5	26.6	26.6	10.1	29.2	29.2	9.6	28.7	
Total Split (%)	12.8%	35.6%	35.6%	12.7%	35.5%	35.5%	13.5%	38.9%	38.9%	12.8%	38.3%	
Maximum Green (s)	5.0	21.0	21.0	5.0	21.3	21.3	5.6	23.6	23.6	5.0	22.8	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2	3.0	3.0	
All-Red Time (s)	1.6	2.7	2.7	1.5	2.1	2.1	1.5	2.4	2.4	1.6	2.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	5.7	5.7	4.5	5.3	5.3	4.5	5.6	5.6	4.6	5.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		13.0	13.0		13.0	13.0		17.0	17.0		16.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	26.2	21.2	21.2	27.1	23.4	23.4	29.3	24.0	24.0	27.1	20.8	
Actuated g/C Ratio	0.37	0.30	0.30	0.38	0.33	0.33	0.41	0.34	0.34	0.38	0.29	
v/c Ratio	0.08	0.70	0.34	0.34	0.29	0.16	0.46	0.75	0.43	0.34	0.57	
Control Delay	13.5	32.5	5.4	17.0	21.6	6.1	17.3	32.7	4.8	15.6	26.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.5	32.5	5.4	17.0	21.6	6.1	17.3	32.7	4.8	15.6	26.5	
LOS	B	C	A	B	C	A	B	C	A	B	C	
Approach Delay		22.4			16.4			20.6			23.9	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	10	153	0	28	60	0	48	188	0	24	109	
Queue Length 95th (ft)	27	#275	45	58	110	31	87	#336	52	49	183	
Internal Link Dist (ft)		566			769			643			885	
Turn Bay Length (ft)	240		200	415			230		230	132		
Base Capacity (vph)	456	521	580	304	570	542	392	602	712	274	558	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.70	0.34	0.34	0.29	0.16	0.46	0.74	0.43	0.34	0.52	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 71.2

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 21.0

Intersection LOS: C

Intersection Capacity Utilization 68.9%

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.

Lanes, Volumes, Timings
 22: Sheyenne St & 13th Ave

11/28/2018

Splits and Phases: 22: Sheyenne St & 13th Ave

 Ø1 9.5 s	 Ø2 26.7 s	 Ø3 9.6 s	 Ø4 29.2 s
 Ø5 9.6 s	 Ø6 26.6 s	 Ø7 10.1 s	 Ø8 28.7 s

Intersection												
Intersection Delay (sec/veh):		4.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	25	640	10	10	275	30	5	60	20	40	25	25
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	100		0	100		0	0		0	0		0
Median Width		16			16			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	27	696	11	11	299	33	5	65	22	43	27	27
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	332	0	0	707	0	0	940	1108	353	772	1098	166
Stage 1	0	0	0	0	0	0	755	755	0	337	337	0
Stage 2	0	0	0	0	0	0	185	353	0	435	761	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1222	-	-	887	-	-	218	209	642	289	211	850
Stage 1	-	-	-	-	-	-	367	415	-	651	640	-
Stage 2	-	-	-	-	-	-	799	629	-	570	412	-
Mov Capacity-1 Maneuver	1222	-	-	887	-	-	184.7	201.9	642	204.2	203.9	850
Mov Capacity-2 Maneuver	-	-	-	-	-	-	184.7	201.9	-	204.2	203.9	-
Stage 1	-	-	-	-	-	-	367	405.9	-	651	632.3	-
Stage 2	-	-	-	-	-	-	731.3	621.5	-	452	402.9	-
Approach	EB			WB			NB			SB		
HCM Control Delay (s)	0.3			0.3			29.2			27.1		
HCM LOS	A			A			D			D		
Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (vph)	239							259				
HCM Control Delay (s)	29.2	8.013	-	-	9.109	-	-	27.1				
HCM Lane VC Ratio	0.387	0.022	-	-	0.012	-	-	0.378				
HCM Lane LOS	D	A	-	-	A	-	-	D				
HCM 95th Percentile Queue (veh)	1.728	0.068	-	-	0.037	-	-	1.681				

Lanes, Volumes, Timings

24: 6th St & 13th Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	690	15	10	280	35	75	55	80	70	25	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	140		0	92		0	100		100	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			80			50			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.983				0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3343	0	1676	3296	0	1676	1765	1500	1676	1689	0
Flt Permitted	0.546			0.314			0.506			0.909		
Satd. Flow (perm)	964	3343	0	554	3296	0	893	1765	1500	1604	1689	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			18				87		11	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		489			566			615			526	
Travel Time (s)		9.5			11.0			16.8			14.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	750	16	11	304	38	82	60	87	76	27	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	766	0	11	342	0	82	60	87	76	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4		4	8		
Detector Phase	5	2		1	6		7	4	4	3	8	

Lanes, Volumes, Timings
24: 6th St & 13th Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	15.0		4.0	15.0		4.0	7.0	7.0	4.0	7.0	
Minimum Split (s)	8.0	24.3		8.0	22.5		9.5	27.6	27.6	8.5	29.8	
Total Split (s)	8.0	27.6		8.0	27.6		9.6	30.8	30.8	8.6	29.8	
Total Split (%)	10.7%	36.8%		10.7%	36.8%		12.8%	41.1%	41.1%	11.5%	39.7%	
Maximum Green (s)	4.0	22.3		4.0	22.1		4.1	25.2	25.2	4.1	24.0	
Yellow Time (s)	3.5	3.6		3.5	3.6		3.0	3.2	3.2	2.0	3.2	
All-Red Time (s)	0.5	1.7		0.5	1.9		2.5	2.4	2.4	2.5	2.6	
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)	4.0	5.3		4.0	5.5		5.5	5.6	5.6	4.5	5.8	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	None	None	None	None	
Walk Time (s)		5.0			5.0			5.0	5.0		5.0	
Flash Dont Walk (s)		14.0			12.0			17.0	17.0		19.0	
Pedestrian Calls (#/hr)		0			0			0	0		0	
Act Effct Green (s)	28.1	27.3		28.1	27.1		10.4	7.8	7.8	8.3	7.3	
Actuated g/C Ratio	0.58	0.57		0.58	0.56		0.22	0.16	0.16	0.17	0.15	
v/c Ratio	0.03	0.40		0.03	0.18		0.28	0.21	0.28	0.27	0.14	
Control Delay	6.9	10.4		7.0	8.8		16.3	21.6	8.6	17.5	18.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	6.9	10.4		7.0	8.8		16.3	21.6	8.6	17.5	18.1	
LOS	A	B		A	A		B	C	A	B	B	
Approach Delay		10.4			8.7			14.8			17.7	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)	2	74		2	27		16	16	0	21	7	
Queue Length 95th (ft)	10	163		8	67		49	47	32	45	31	
Internal Link Dist (ft)		409			486			535			446	
Turn Bay Length (ft)	140			92			100		100	100		
Base Capacity (vph)	621	1894		417	1863		298	939	839	284	861	
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	0.03	0.40		0.03	0.18		0.28	0.06	0.10	0.27	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 48.2

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 11.2

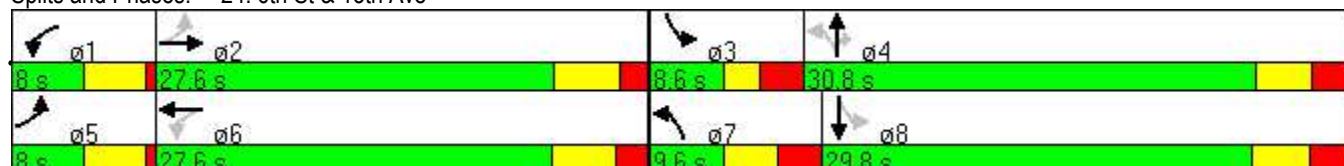
Intersection LOS: B

Intersection Capacity Utilization 43.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 24: 6th St & 13th Ave



Intersection

Intersection Delay (sec/veh): 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	30	820	15	10	340	25	5	5	35	5	5	15
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	130		0	150		0	0		0	0		0
Median Width		16			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	33	891	16	11	370	27	5	5	38	5	5	16
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	397	0	0	908	0	0	1174	1383	454	919	1378	198
Stage 1	0	0	0	0	0	0	965	965	0	405	405	0
Stage 2	0	0	0	0	0	0	209	418	0	514	973	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	1157	-	-	745	-	-	147	143	553	226	144	808
Stage 1	-	-	-	-	-	-	274	331	-	593	597	-
Stage 2	-	-	-	-	-	-	774	589	-	511	329	-
Mov Capacity-1 Maneuver	1157	-	-	745	-	-	135.2	136.9	553	197.5	137.9	808
Mov Capacity-2 Maneuver	-	-	-	-	-	-	135.2	136.9	-	197.5	137.9	-
Stage 1	-	-	-	-	-	-	274	321.7	-	593	588	-
Stage 2	-	-	-	-	-	-	740.1	580.2	-	454.7	319.8	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.3	0.3	17.8	17.6
HCM LOS	A	A	C	C

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	329							312
HCM Control Delay (s)	17.8	8.202	-	-	9.904	-	-	17.6
HCM Lane VC Ratio	0.149	0.028	-	-	0.015	-	-	0.087
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th Percentile Queue (veh)	0.516	0.087	-	-	0.044	-	-	0.284

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	295	185	240	335	115	190	275	180	130	370	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	240		200	415		0	230		230	132		0
Storage Lanes	1		1	1		1	1		1	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
Frt			0.850			0.850			0.850		0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1660	1748	1485	1644	1731	1471	1676	1765	1500	1644	1712	0
Flt Permitted	0.526			0.344			0.196			0.498		
Satd. Flow (perm)	919	1748	1485	595	1731	1471	346	1765	1500	862	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			201			125			196		5	
Link Speed (mph)		25			35			30			25	
Link Distance (ft)		646			849			723			965	
Travel Time (s)		17.6			16.5			16.4			26.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	16	321	201	261	364	125	207	299	196	141	402	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	321	201	261	364	125	207	299	196	141	435	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			16			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

11/28/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	9.6	23.7	23.7	9.5	23.3	23.3	9.5	27.6	27.6	9.6	26.9	
Total Split (s)	9.6	25.0	25.0	12.0	27.4	27.4	11.0	28.4	28.4	9.6	27.0	
Total Split (%)	12.8%	33.3%	33.3%	16.0%	36.5%	36.5%	14.7%	37.9%	37.9%	12.8%	36.0%	
Maximum Green (s)	5.0	19.3	19.3	7.5	22.1	22.1	6.5	22.8	22.8	5.0	21.1	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2	3.0	3.0	
All-Red Time (s)	1.6	2.7	2.7	1.5	2.1	2.1	1.5	2.4	2.4	1.6	2.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	5.7	5.7	4.5	5.3	5.3	4.5	5.6	5.6	4.6	5.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		13.0	13.0		13.0	13.0		17.0	17.0		16.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	25.4	19.3	19.3	32.1	29.8	29.8	30.3	24.1	24.1	26.7	20.4	
Actuated g/C Ratio	0.34	0.26	0.26	0.43	0.40	0.40	0.41	0.32	0.32	0.36	0.27	
v/c Ratio	0.04	0.71	0.38	0.72	0.52	0.19	0.80	0.52	0.32	0.39	0.92	
Control Delay	12.9	35.3	6.0	28.9	21.9	4.7	40.4	25.3	4.9	17.1	53.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.9	35.3	6.0	28.9	21.9	4.7	40.4	25.3	4.9	17.1	53.5	
LOS	B	D	A	C	C	A	D	C	A	B	D	
Approach Delay		23.7			21.5			24.1			44.6	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	4	136	0	79	119	0	58	116	0	38	192	
Queue Length 95th (ft)	15	#245	48	#167	#253	36	#144	192	43	72	#360	
Internal Link Dist (ft)		566			769			643			885	
Turn Bay Length (ft)	240		200	415			230		230	132		
Base Capacity (vph)	364	454	534	363	694	665	258	573	618	362	490	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.71	0.38	0.72	0.52	0.19	0.80	0.52	0.32	0.39	0.89	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 74.3

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 27.8

Intersection LOS: C

Intersection Capacity Utilization 81.2%

ICU Level of Service D

Analysis Period (min) 15

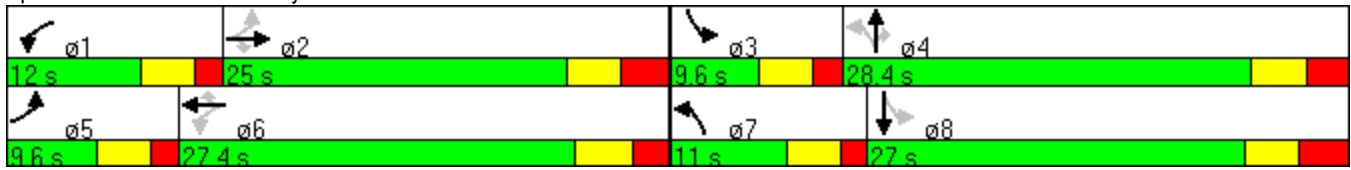
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
22: Sheyenne St & 13th Ave

11/28/2018

Splits and Phases: 22: Sheyenne St & 13th Ave



Intersection

Intersection Delay (sec/veh): 9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	20	560	5	30	640	40	5	25	20	40	50	25
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	100		0	100		0	0		0	0		0
Median Width		16			16			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	22	609	5	33	696	43	5	27	22	43	54	27
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	739	0	0	614	0	0	1095	1459	307	1144	1441	370
Stage 1	0	0	0	0	0	0	655	655	0	783	783	0
Stage 2	0	0	0	0	0	0	440	804	0	361	658	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	863	-	-	961	-	-	168	128	689	155	131	628
Stage 1	-	-	-	-	-	-	421	461	-	353	403	-
Stage 2	-	-	-	-	-	-	566	394	-	630	459	-
Mov Capacity-1 Maneuver	863	-	-	961	-	-	101.1	120.6	689	118.8	123.4	628
Mov Capacity-2 Maneuver	-	-	-	-	-	-	101.1	120.6	-	118.8	123.4	-
Stage 1	-	-	-	-	-	-	421	449.5	-	353	389.3	-
Stage 2	-	-	-	-	-	-	450.1	380.6	-	558.9	447.5	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.3	0.4	34.6	98.3
HCM LOS	A	A	D	F

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	175							147
HCM Control Delay (s)	34.6	9.279	-	-	8.878	-	-	98.3
HCM Lane VC Ratio	0.311	0.025	-	-	0.034	-	-	0.85
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th Percentile Queue (veh)	1.248	0.077	-	-	0.105	-	-	5.608

Lanes, Volumes, Timings

24: 6th St & 13th Ave

11/28/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	645	20	80	725	35	35	30	50	40	25	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (ft)	140		0	92		0	100		100	100		0
Storage Lanes	1		0	1		0	2		1	2		0
Taper Length (ft)	25			80			50			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	0.97	1.00	1.00
Frt		0.995			0.993				0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3336	0	1676	3329	0	3252	1765	1500	3252	1689	0
Flt Permitted	0.320			0.368			0.950			0.950		
Satd. Flow (perm)	565	3336	0	649	3329	0	3252	1765	1500	3252	1689	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			8				54		11	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		489			566			615			526	
Travel Time (s)		9.5			11.0			16.8			14.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	701	22	87	788	38	38	33	54	43	27	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	723	0	87	826	0	38	33	54	43	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2			6					4			
Detector Phase	2	2		6	6		7	4	4	3	8	

Lanes, Volumes, Timings

24: 6th St & 13th Ave

11/28/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		4.0	7.0	7.0	4.0	7.0	
Minimum Split (s)	24.3	24.3		22.5	22.5		9.5	27.6	27.6	8.5	29.8	
Total Split (s)	25.7	25.7		25.7	25.7		9.5	30.8	30.8	8.5	29.8	
Total Split (%)	39.5%	39.5%		39.5%	39.5%		14.6%	47.4%	47.4%	13.1%	45.8%	
Maximum Green (s)	20.4	20.4		20.2	20.2		4.0	25.2	25.2	4.0	24.0	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.0	3.2	3.2	2.0	3.2	
All-Red Time (s)	1.7	1.7		1.9	1.9		2.5	2.4	2.4	2.5	2.6	
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)	5.3	5.3		5.5	5.5		5.5	5.6	5.6	4.5	5.8	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None	None	None	None	
Walk Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Flash Dont Walk (s)	14.0	14.0		12.0	12.0			17.0	17.0		19.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	
Act Effct Green (s)	29.2	29.2		29.1	29.1		4.0	7.7	7.7	4.0	7.2	
Actuated g/C Ratio	0.67	0.67		0.67	0.67		0.09	0.18	0.18	0.09	0.17	
v/c Ratio	0.03	0.32		0.20	0.37		0.13	0.11	0.17	0.14	0.13	
Control Delay	8.3	7.3		9.9	7.8		20.7	17.0	7.8	20.9	15.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	8.3	7.3		9.9	7.8		20.7	17.0	7.8	20.9	15.1	
LOS	A	A		A	A		C	B	A	C	B	
Approach Delay		7.3			8.0			14.2			18.1	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	1	40		9	48		4	6	0	4	5	
Queue Length 95th (ft)	9	115		44	136		16	26	22	17	26	
Internal Link Dist (ft)		409			486			535			446	
Turn Bay Length (ft)	140			92			100		100	100		
Base Capacity (vph)	381	2252		436	2239		303	1036	902	303	949	
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	0.03	0.32		0.20	0.37		0.13	0.03	0.06	0.14	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 43.3

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 8.6

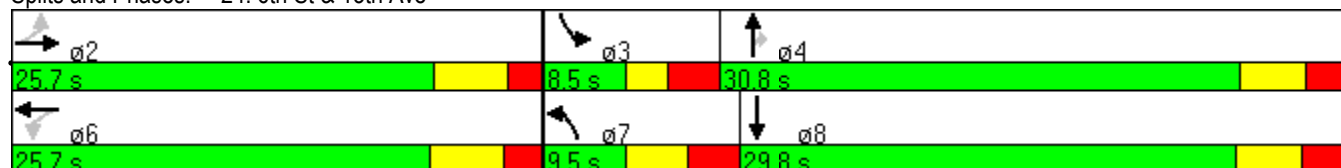
Intersection LOS: A

Intersection Capacity Utilization 56.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 24: 6th St & 13th Ave



Intersection

Intersection Delay (sec/veh): 8.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	15	745	15	55	820	5	30	5	50	35	10	50
Conflicting Peds.(#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Right Turn Channelized	None	None	None	None	None	None	None	None	None	None	None	None
Storage Length	130		0	150		0	0		0	0		0
Median Width		16			12			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2	2	2	2	2	2	2
Movement Flow Rate	16	810	16	60	891	5	33	5	54	38	11	54
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Major/Minor	Major 1			Major 2			Minor 1			Minor 1		
Conflicting Flow Rate - All	897	0	0	826	0	0	1422	1867	413	1454	1873	448
Stage 1	0	0	0	0	0	0	851	851	0	1014	1014	0
Stage 2	0	0	0	0	0	0	571	1016	0	440	859	0
Follow-up Headway	2.22	-	-	2.22	0	0	3.52	4.02	3.32	3.52	4.02	3.32
Pot Capacity-1 Maneuver	752	-	-	801	-	-	96	72	588	91	71	558
Stage 1	-	-	-	-	-	-	321	375	-	256	314	-
Stage 2	-	-	-	-	-	-	473	314	-	566	371	-
Mov Capacity-1 Maneuver	752	-	-	801	-	-	70	65.1	588	71.7	64.2	558
Mov Capacity-2 Maneuver	-	-	-	-	-	-	70	65.1	-	71.7	64.2	-
Stage 1	-	-	-	-	-	-	321	366.8	-	256	290.5	-
Stage 2	-	-	-	-	-	-	380.1	290.5	-	494.9	362.8	-

Approach	EB	WB	NB	SB
HCM Control Delay (s)	0.2	0.6	66.5	96.1
HCM LOS	A	A	F	F

Lane	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (vph)	144							130
HCM Control Delay (s)	66.5	9.893	-	-	9.857	-	-	96.1
HCM Lane VC Ratio	0.642	0.022	-	-	0.075	-	-	0.794
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th Percentile Queue (veh)	3.486	0.066	-	-	0.241	-	-	4.772