

The Aurora Highlands North Area, Area B Traffic Impact Study

Please check the consistency of the Appendices, particularly the signal warrant reports included. It appears some intersections are missing (specifically 42nd/Reserve, which is shown to be signalized) and it appears there are duplicate reports for nearly all the intersections.

42nd/Reserve, projected to be signalized, appears to have pretty low volumes and may not meet warrants. Please confirm. I compared volumes at 42nd/Reserve to 42nd/Fultondale.

Aerotropolis A

8390 Ea

Please provide version removing the DRAFT watermark and providing CO PE stamp for the analysis, per TIS guidelines.

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Appendix A – Background Traffic Volumes

Appendix B – ITE Trip Generation Calculations

Appendix C – Horizon Without Project Analyses

Appendix D – Horizon With Project Analyses

Introduction

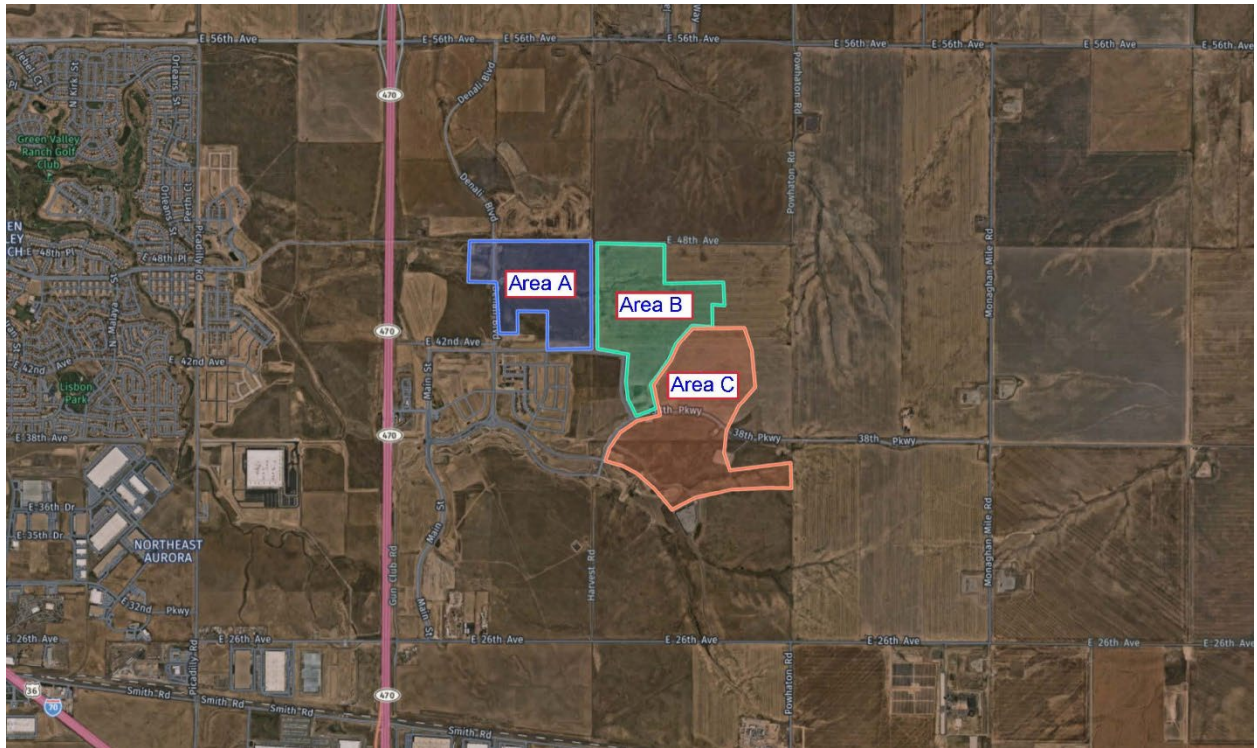
The Aurora Highlands is a 2,550-acre development located between Denver International Airport (DEN) and Interstate 70 (I-70). The Aurora Highland North (TAH North) phase includes the majority of the planning areas between 42nd Avenue and 28th Avenue. TAH North has been split into three sub-areas; Area A, Area B and Area C.

The purpose of this study is to assess the effects the development of the TAH North, Area B will have on the surrounding transportation system.

The report is organized as follows:

- **Introduction** – Describes the purpose and intent of this study.
- **Area Conditions** – Describes the study area land uses as well as the existing and future roadway network.
- **Proposed Development** – Describes the proposed development and the location.
- **Projected Traffic** – Identifies the expected number of daily and peak hour trips that will be generated by the Aurora Highlands, North Area, Area B development. The expected external trip distribution is also shown.
- **Traffic Analysis** – Will analyze the horizon year (2040) conditions with and without the project.
- **Findings and Conclusions** – Identifies any deficiencies in the study area roadway network with or without the project and mitigation measures that will alleviate any identified deficiencies.
- **Recommendations** – Provides a summary of the study findings.

Figure 1. Vicinity Map

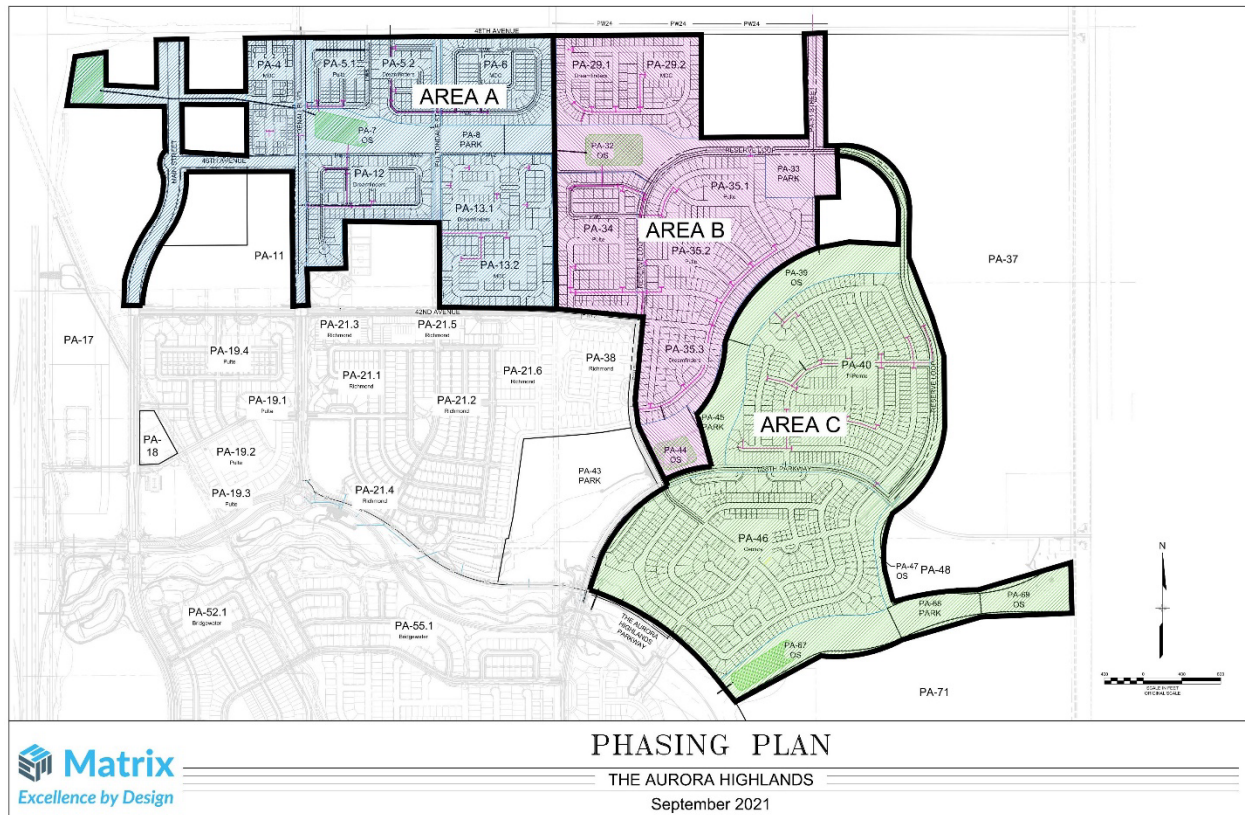


Proposed Development

The Aurora Highlands North Area will consist of 2,107 single family detached homes. The Aurora Highlands Area B consists of 586 single family detached homes.

Figure 2 illustrates The Aurora Highlands North site plan.

Figure 2. The Aurora Highlands North Area Site Plan



Area Conditions

This section describes the existing conditions and the planned level of improvements adjacent to the Aurora Highlands North Area development.

Study Area Land Use

The Aurora Highlands, North Area will be constructed on vacant land and is bound on the west by E-470, on the south by the future The Aurora Highlands Parkway, on the east by the future Powhaton Road and the north by 48th Avenue. This area of Aurora is mostly vacant land but is growing rapidly and includes other developments such as other areas of The Aurora Highlands, Windler, Sagebrush and ATEC.

Site Accessibility

The existing roadway system is largely non-existent in this area of Aurora. However, the future roadway network consists of the following transportation facilities:

E-470 is a north-south four-lane tollway that runs along The Aurora Highlands' west side. A grade-separated interchange is provided at 56th Avenue. An interchange is planned at 48th Avenue and the bridge over E-470 at 48th Avenue is in place (the roadway connecting to it is not yet built, nor are the ramps).

26th Avenue is a minor two-lane roadway facility along the south side of The Aurora Highlands spanning E-470 (no interchange) and extending to Picadilly Road to the west and Watkins Road to the east.

Powhaton Road is a two-lane road that will ultimately define the east side of the residential development within The Aurora Highlands. Currently, this road extends south from 26th Avenue as a two-lane facility, crossing the Union Pacific (UP) Railroad at-grade, spanning I-70, and extending south to Jewell Avenue.

48th Avenue will be constructed on the north side of The Aurora Highlands prior to issuance of any Certificate of Occupancy for lots within TAH North. 48th Avenue will ultimately be a 6-lane major arterial and have a grade-separate interchange with E-470. The south half of this arterial will be built in conjunction with The Aurora Highlands by ARTA (Aerotropolis Regional Transportation Authority). The north half of 48th Avenue will be constructed by the Windler development to the north. The timing of individual developments is unclear, so it is difficult to determine when 48th Avenue will need to be constructed beyond each half-road section. It is assumed that if only the north or south half of 48th Avenue is constructed first, that it would serve temporarily as a 3-lane collector road with one lane in each direction and a center turn lane. In this scenario, the daily threshold for the half roadway section would be 12,000 vehicles-per-day. Daily traffic from Area B alone would not require more than the south half three-lane collector road section on its own.

42nd Avenue is an east-west two-lane road lies on the south side of Area A. This road will ultimately connect Area B to E-470

The Aurora Highlands Parkway currently exists as an east-west four-lane to six-lane facility between Main Street and 38th Parkway. It has a large median east of Denali Boulevard containing a creek and recreational trail. The Aurora Highlands Parkway will ultimately be a four-lane minor arterial.

38th Parkway currently exists as a three-lane (striped median/center turn lane) roadway between The Aurora Highlands Parkway and Reserve Loop (western connection). It will ultimately connect to Powhaton Road as a three-lane collector road.

No existing conditions analysis will be completed for this study as the land is mostly vacant at this time and has no traffic other than construction traffic. No new traffic counts were conducted for this study. This study builds on the traffic volumes presented *The Aurora Highlands Traffic Impact Study*, dated August 2019 which looked at the entirety of The Aurora Highlands development. The studies of surrounding developments are as follows:

- The Northeast Area Transportation Study Refresh (NEATS), 2018
- The Aurora Highlands Transportation Impact Study; August 2019
- ATEC Traffic Impact Analysis; November 2019

- Windler Master Plan Master Traffic Study; October 2021
- The Aurora Highlands Filings 4, Filing 5 and Filing 8 - Planning Areas 18 and 19, April 2020
- The Aurora Highlands Filing Number 1, and 2 Future Filing East of Filing No.2 – Planning Areas 21 and 38, July 2019
- Powhatan Road Alignment Study, October 2022

Projected Development Traffic

This section documents how much traffic The Aurora Highlands, North Area, Area B development is expected to generate and how the external site trips will be distributed on the adjacent roadway network.

Trip Generation

The vehicle trips associated with The Aurora Highlands, North Area, Area B were calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition*. This methodology consists of choosing an independent variable for the land use for a particular time of day. The independent variable correlates to the variation in trip ends and is related to the land use. The value of the independent variable is either multiplied by a weighted average or used in a regression equation to calculate the trips generated by the land use. The *ITE Trip Generation Manual* provides guidance on when to use the weighted average versus the regression equation. In most cases, the regression equations are recommended when there are adequate study data points.

Table 1 shows the trips that are expected to be generated by The Aurora Highlands, North Area, Area B at build out.

Table 1. TAH North Area B Trip Generation

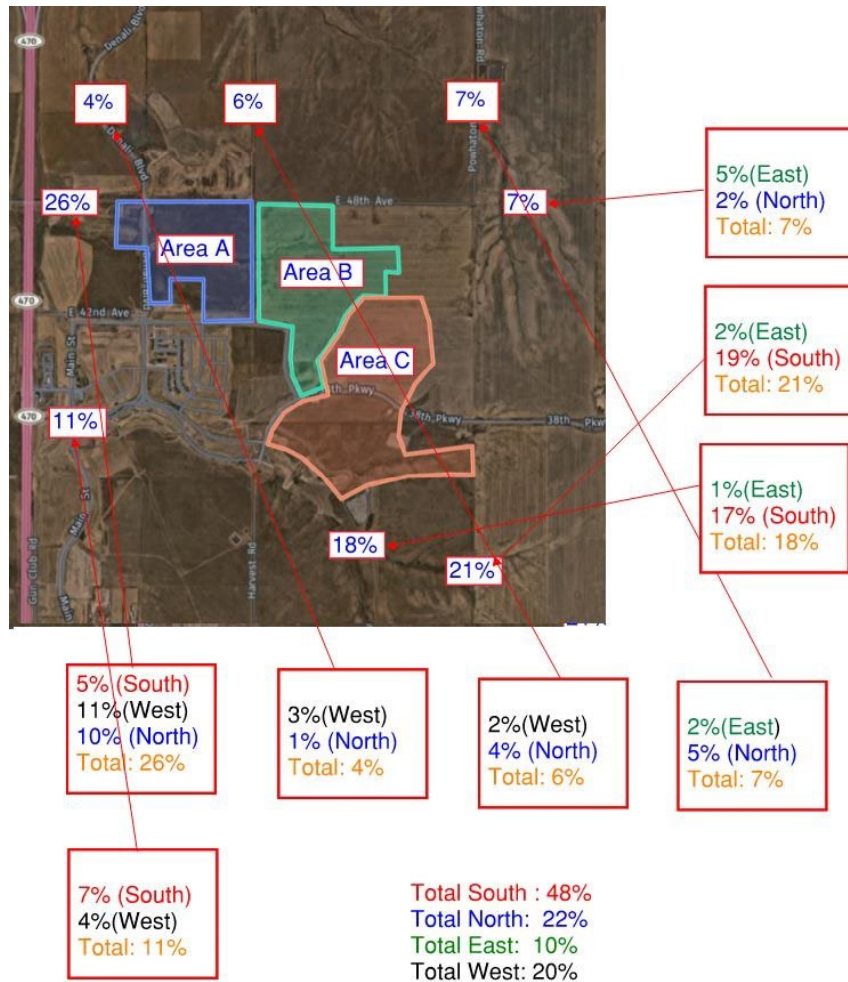
The Aurora Highlands - Area B												
Parcel	ITE Land Use and Code	Size	Units	Weekday			AM Peak Hour			PM Peak Hour		
				Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting
PA-34	210 - Single-Family Detached Housing	162	DU	1572	786	786	116	30	86	157	99	58
PA-29.1	210 - Single-Family Detached Housing	50	DU	534	267	267	39	10	29	52	33	19
PA-29.2	210 - Single-Family Detached Housing	118	DU	1176	588	588	87	23	64	116	73	43
PA-35.1	210 - Single-Family Detached Housing	79	DU	812	406	406	60	16	44	79	50	29
PA-35.2	210 - Single-Family Detached Housing	105	DU	1056	528	528	78	20	58	104	66	38
PA-35.3	210 - Single-Family Detached Housing	72	DU	746	373	373	55	14	41	73	46	27
Totals		586	DU	5896	2948	2948	435	113	322	581	367	214

No trip reduction is accounted for because there is only one land-use.

Trip Distribution

Figure 3 illustrates the expected external distribution of travel for the site-generated trips. This distribution was determined by reviewing the general distribution of trips on the roadway network in *The Aurora Highlands Traffic Impact Study*, dated August 2019.

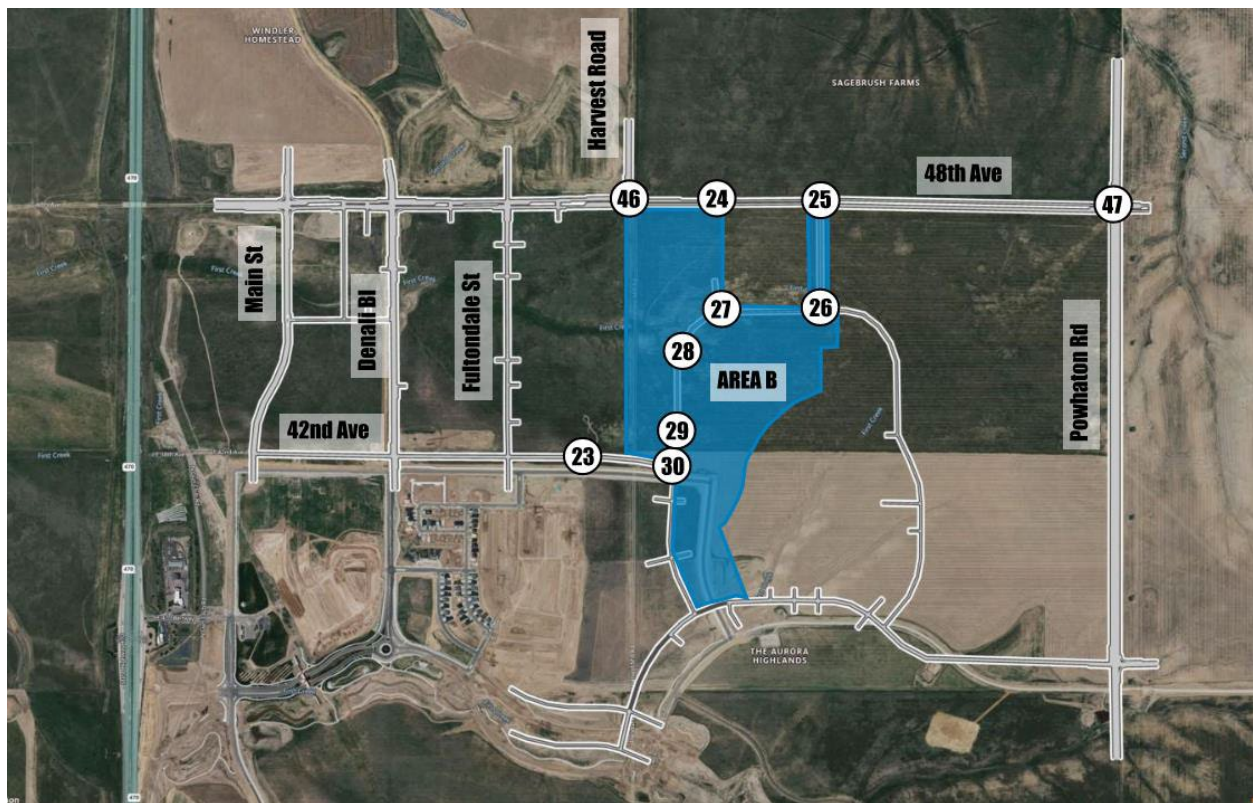
Figure 3. Trip Distribution



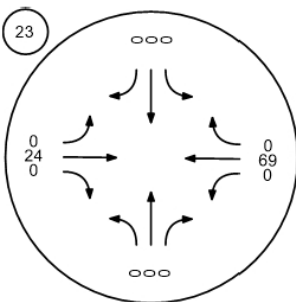
The overall distribution based on the previous study is 48% of the trips will travel to/from the south; 20% of the trips will travel to/from the west; 22% of the trips will travel to/from the north and 10% of the trips will travel to/from the east. Recently, a new connection from Powhatan Road (Aerotropolis Parkway) to Jackson Gap Way was proposed that would ultimately affect the traffic on 48th Avenue, Powhatan Road, and Harvest Road. After a careful review of this new alignment and its impact on the adjacent road we concluded that it would have a minimal impact on our site trips due to the distance between the new alignment and the project. However, to address this small impact we adjusted the trip distribution on Denali Boulevard, Harvest Road and Powhatan Road in a way that 2 percent of the trips that were supposed to be made through Denali Boulevard and Harvest Road are shifting to this new alignment. The overall distribution remained unchanged and when those overall distributions are distributed among the available lanes traveling in each direction, the distributions shown in Figure 3 is the result. This new improvement would mainly alleviate the background traffic on 48th Avenue since it will provide an alternative for long distance travelers especially for trips to/from the DEN airport.

The project trips for both the AM and PM peak hours are shown in Figure 4 and Figure 5 and daily project trips are shown in Figure 6.

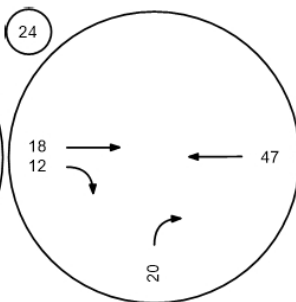
Figure 4. The Aurora Highlands North, Area B Project Trips (AM Peak Hour)



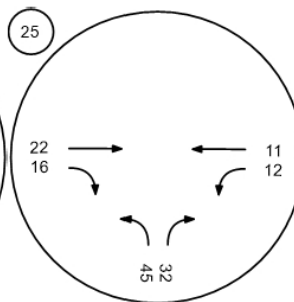
42nd Ave/PA 13.1 Access 2



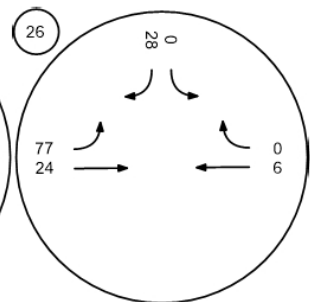
48th Ave/Road D



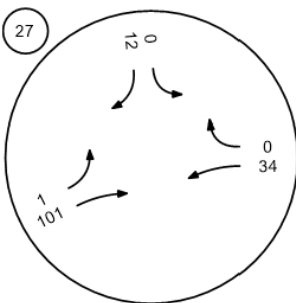
48th Avenue/PA-31 Street



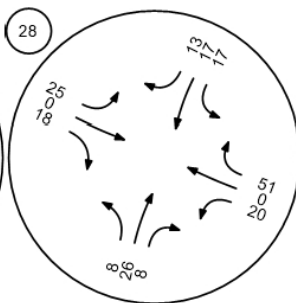
Reserve Loop/PA-31 Street



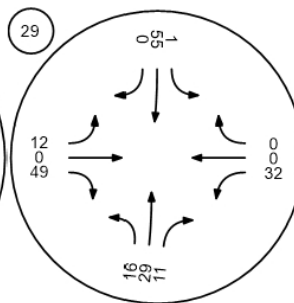
Reserve Loop/Road C



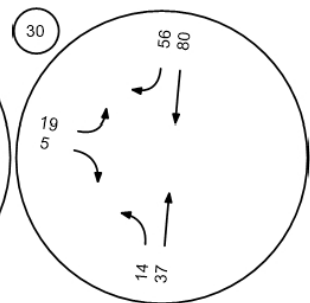
Reserve Loop/Road B



Reserve Loop/Road A



42nd Avenue/Reserve Loop



The Aurora Highlands North, Area B Project Trips (AM Peak Hour) Continued



48th Avenue/Harvest Road 48th Avenue/Powhatan Road

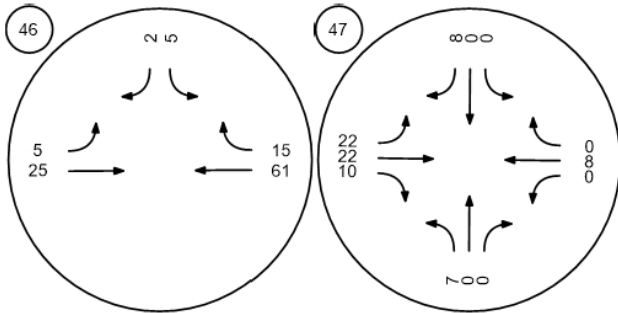
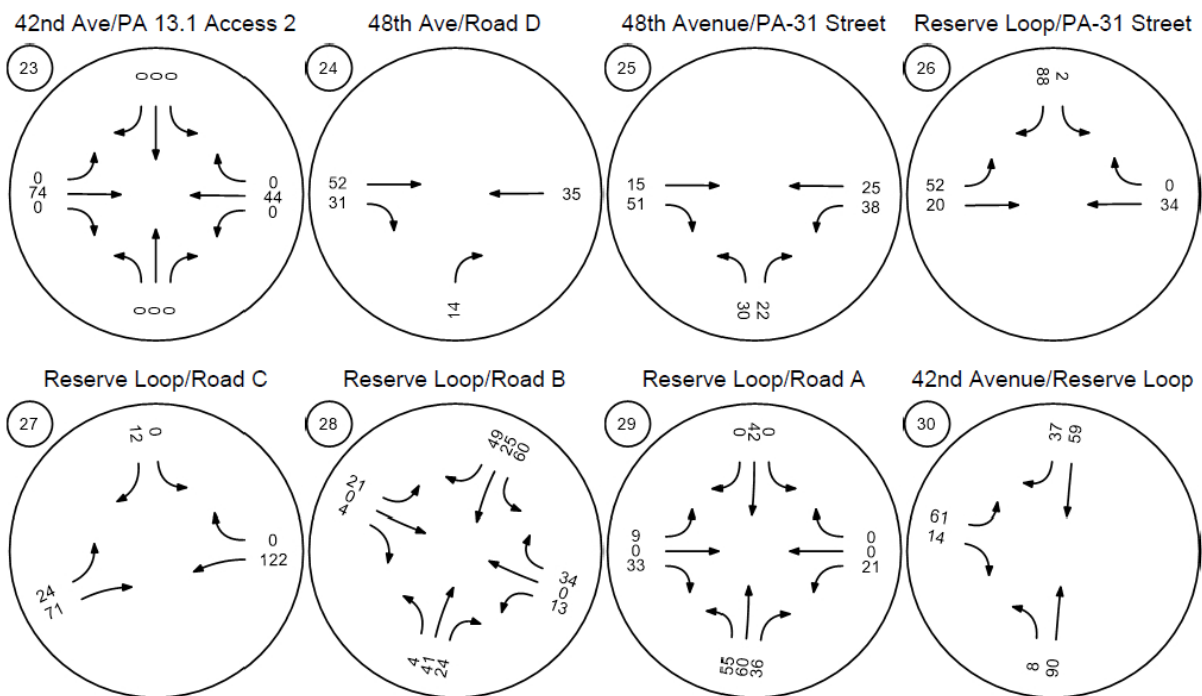
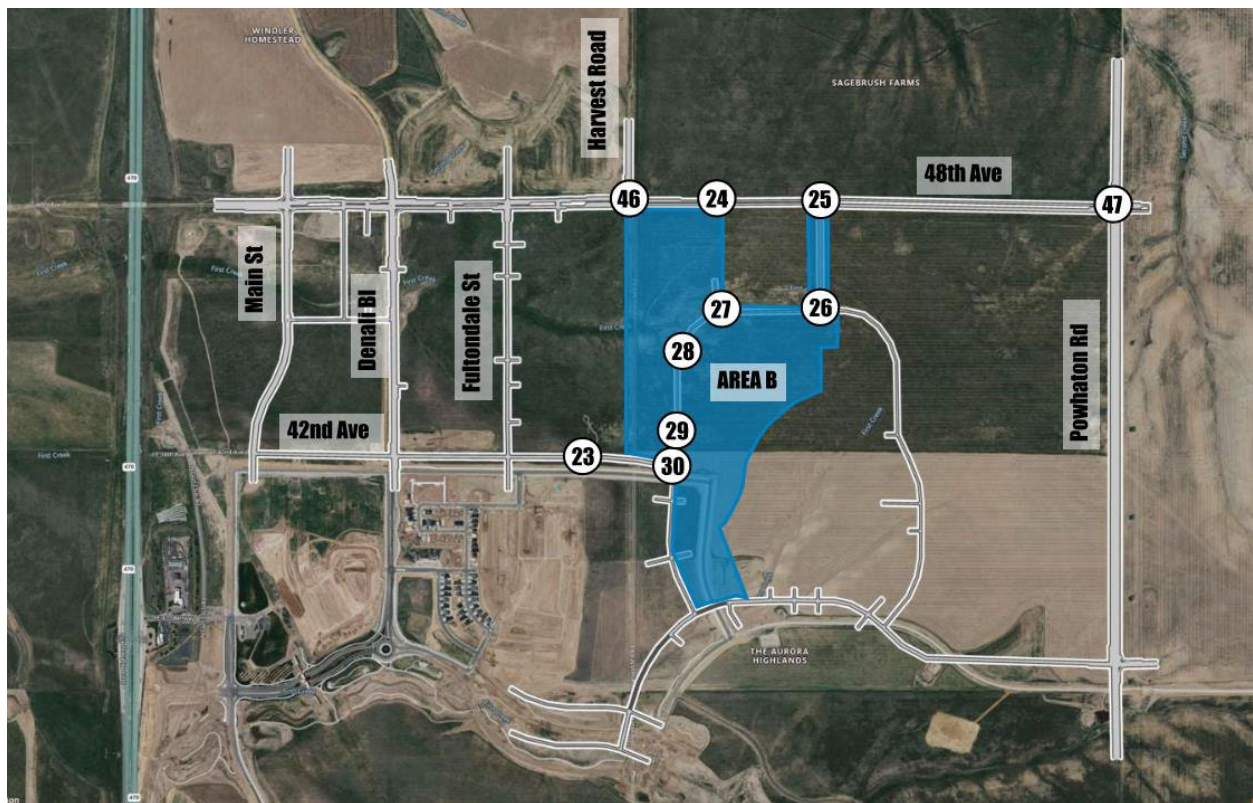


Figure 5. The Aurora Highlands North, Area B Project Trips (PM Peak)



The Aurora Highlands North, Area B Project Trips (PM Peak) Continued



48th Avenue/Harvest Road 48th Avenue/Powhatan Road

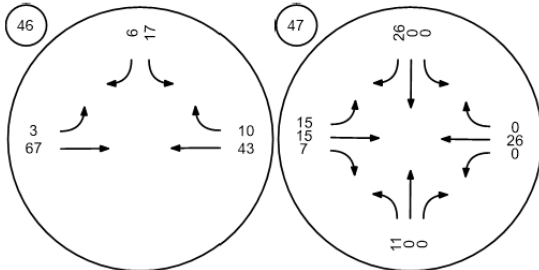
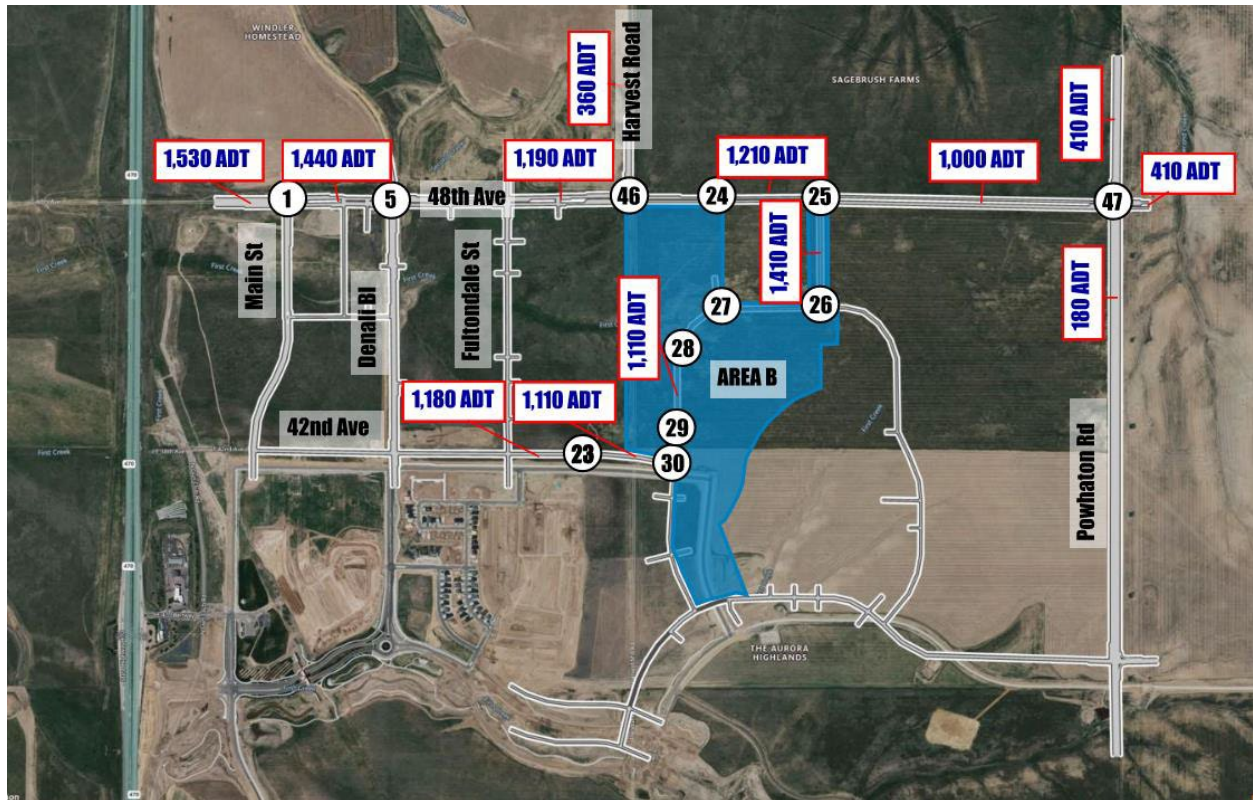


Figure 6. The Aurora Highlands North, Area B Daily Site Trips



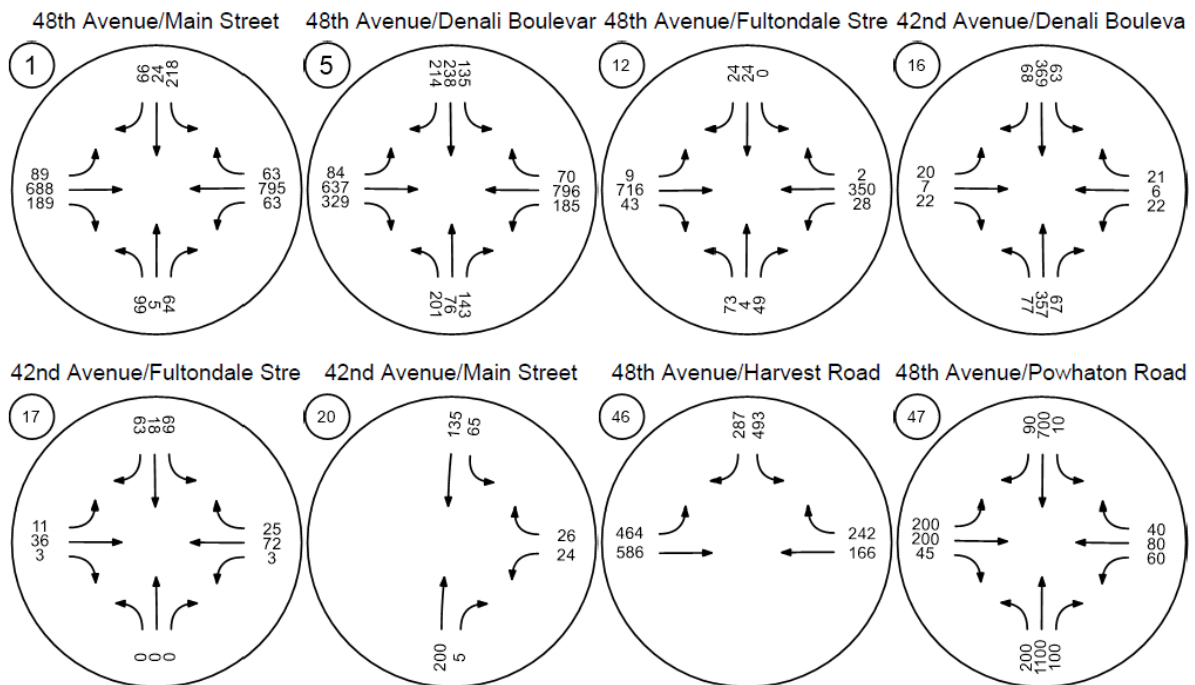
Traffic Analysis

Traffic conditions both with and without the project have been analyzed for horizon year (2040) conditions.

Horizon (2040) Year No Project Conditions

The horizon year traffic volumes without the Aurora Highlands project are shown in Figure 7 and Figure 8 and daily traffic volumes are shown in Figure 9. The background volumes along 48th Avenue and Powhaton Avenue were taken from a combination of the Windler Master Plan TIS and the ATEC TIS. These volumes were later adjusted based on the new planned connection between Powhaton road and Jackson Gap Way. Roadway and intersection configurations are taken from *the Aurora Highlands TIS, Windler Master Plan TIS, ATEC TIS, and The Aurora Highlands Filing 4, 5, and PA 18 and 19*. For more information see Appendix C – Horizon Without Project Analyses.

Figure 7. Horizon Year No Project Traffic Volumes (AM Peak Hour)



Horizon Year No Project Traffic Volumes (AM Peak Hour) Continued



38th Parkway/Powhatan Road

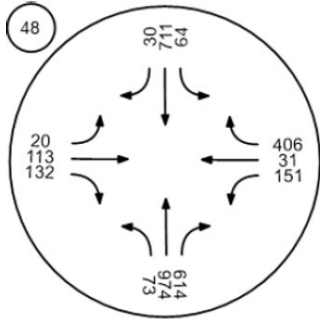
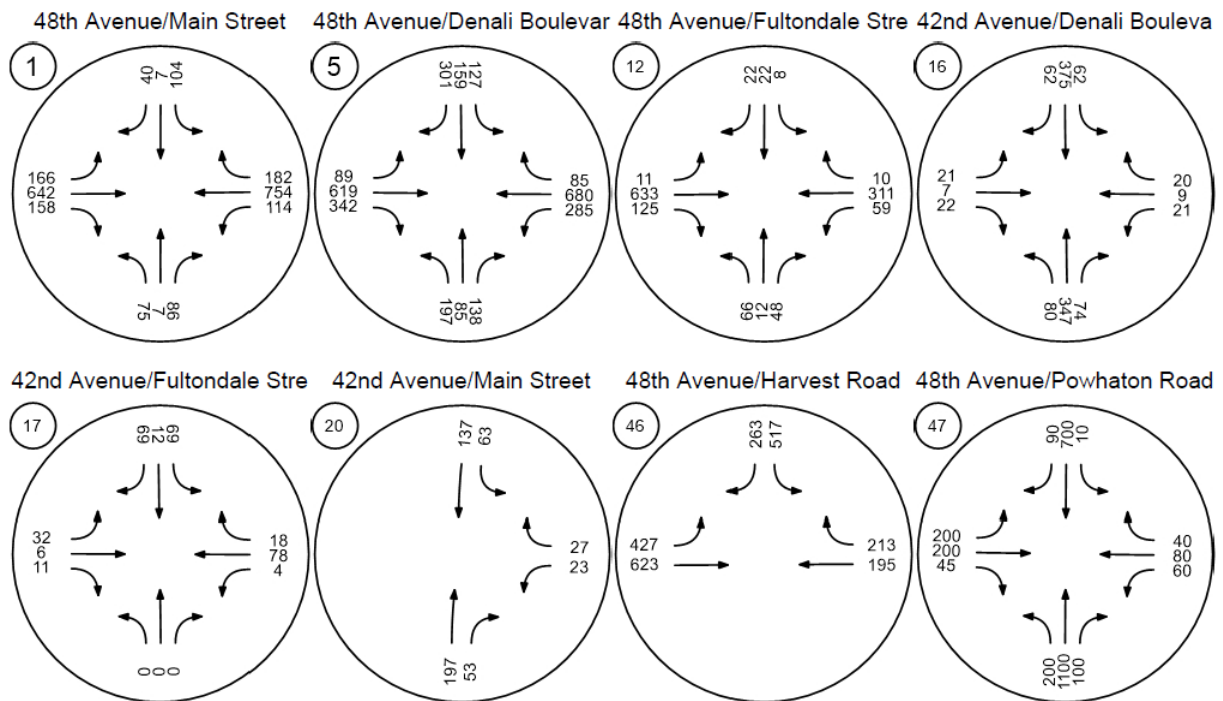


Figure 8. Horizon Year No Project Traffic Volumes (PM Peak Hour)



Horizon Year No Project Traffic Volumes (PM Peak Hour) Continued



38th Parkway/Powhatan Roa

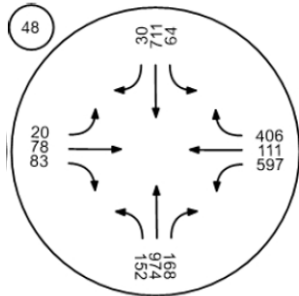
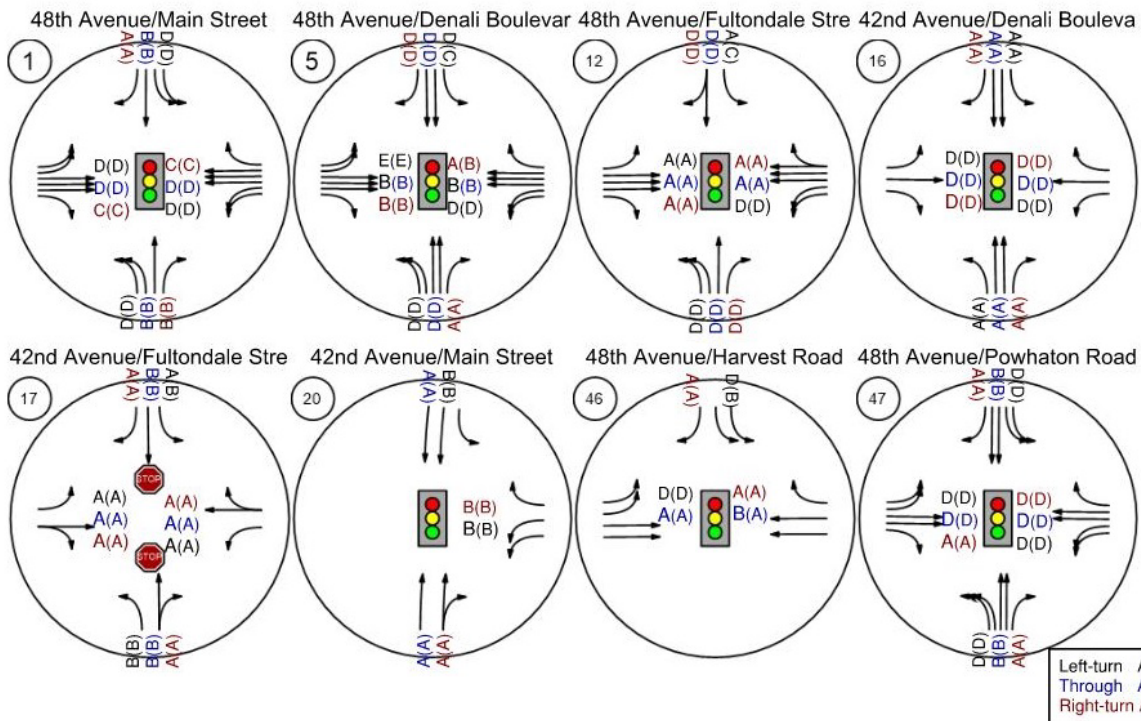


Figure 9. Horizon No Project Daily Traffic Volumes

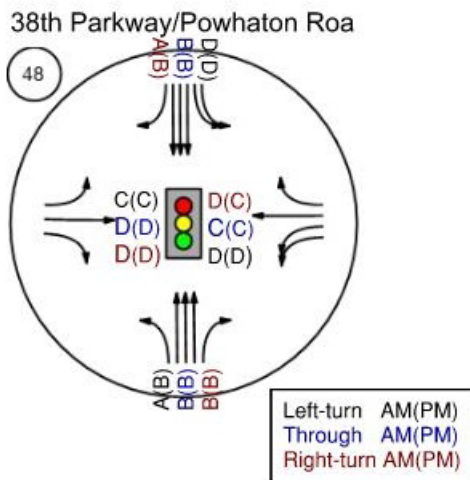


For more information regarding the background ADT and the adjustments based on the new connection between Powhatan Road and Jackson Gap Way see Appendix C – Horizon Without Project. The assumed intersection configurations are shown in Figure 10. The operations of the study area intersections in the build out background (no project) scenario are shown in Tables 2 and 3.

Figure 10. Horizon No Project Intersection Configurations And LOS



Horizon No Project Intersection Configurations And LOS Continued



Intersection configurations were taken from a combination of the *Windler Master Plan TIS*, the *ATEC TIS* and the new alignment at Powhatan Road to Jackson Gap Way.

Table 2. Horizon Background Intersection Operations (AM Peak Hour)

Intersection Analysis Summary							
ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	48th Avenue/Main Street	Signalized	HCM 7th Edition	EB Left	0.320	39.6	D
5	48th Avenue/Denali Boulevard	Signalized	HCM 7th Edition	EB Left	0.369	26.3	C
12	48th Avenue/Fultondale Street	Signalized	HCM 7th Edition	WB Left	0.229	10.4	B
16	42nd Avenue/Denali Boulevard	Signalized	HCM 7th Edition	WB Left	0.144	8.7	A
17	42nd Avenue/Fultondale Street	Two-way stop	HCM 7th Edition	SB Thru	0.028	10.4	B
20	42nd Avenue/Main Street	Signalized	HCM 7th Edition	WB Right	0.078	9.4	A
46	48th Avenue/Harvest Road	Signalized	HCM 7th Edition	EB Left	0.314	27.4	C
47	48th Avenue/Powhatan Road	Signalized	HCM 7th Edition	SB Left	0.474	21.4	C
48	38th Parkway/Powhatan Road	Signalized	HCM 7th Edition	SB Left	0.421	19.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

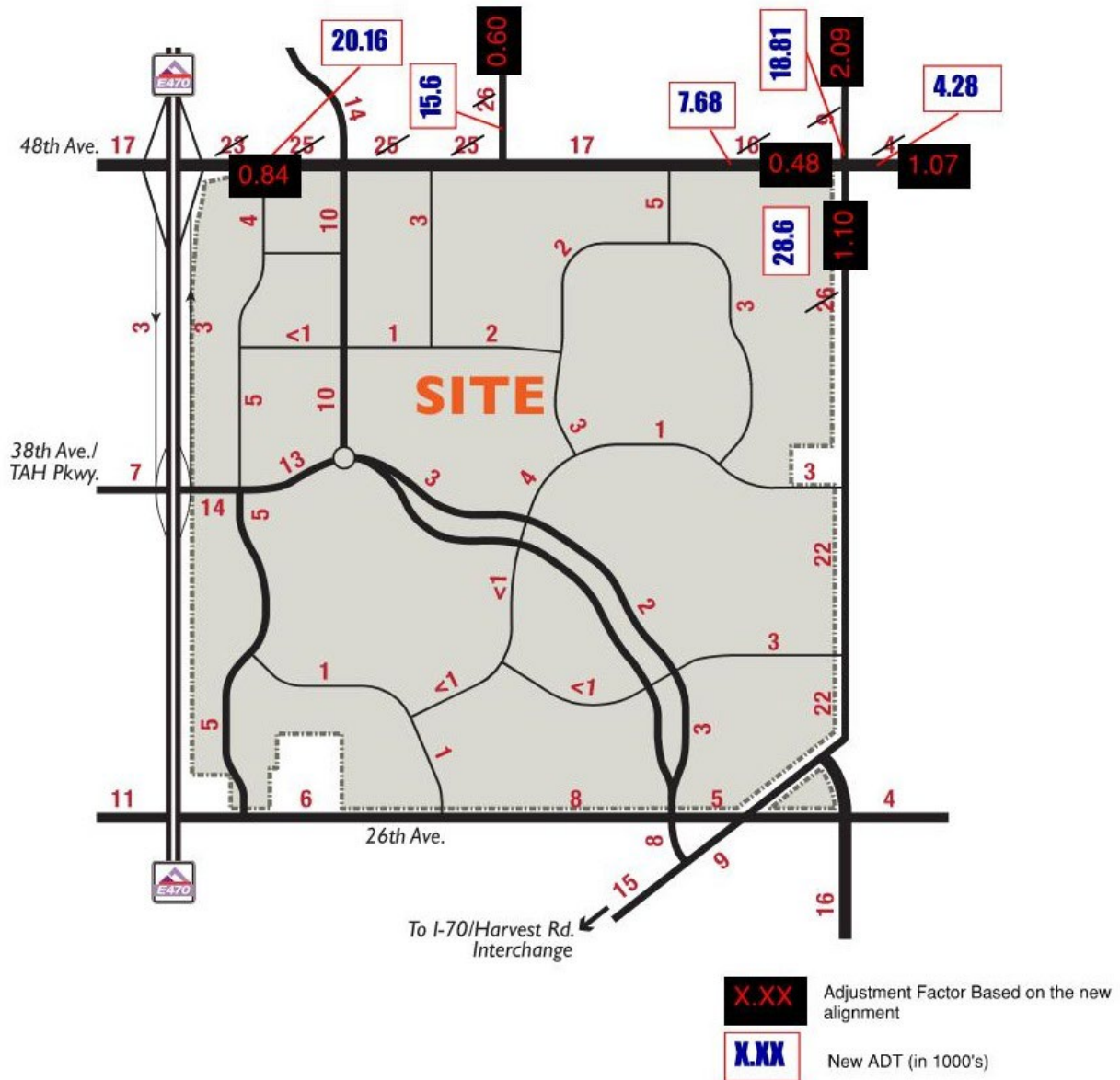
Table 3. Horizon Background Intersection Operations (PM Peak Hour)

Intersection Analysis Summary							
ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	48th Avenue/Main Street	Signalized	HCM 7th Edition	SB Left	0.306	39.8	D
5	48th Avenue/Denali Boulevard	Signalized	HCM 7th Edition	EB Left	0.429	28.6	C
12	48th Avenue/Fultondale Street	Signalized	HCM 7th Edition	NB Left	0.216	11.7	B
16	42nd Avenue/Denali Boulevard	Signalized	HCM 7th Edition	EB Left	0.146	8.8	A
17	42nd Avenue/Fultondale Street	Two-way stop	HCM 7th Edition	SB Thru	0.019	10.7	B
20	42nd Avenue/Main Street	Signalized	HCM 7th Edition	SB Left	0.085	9.5	A
46	48th Avenue/Harvest Road	Signalized	HCM 7th Edition	EB Left	0.332	26.4	C
47	48th Avenue/Powhatan Road	Signalized	HCM 7th Edition	SB Left	0.474	21.4	C
48	38th Parkway/Powhatan Road	Signalized	HCM 7th Edition	WB Left	0.512	27.6	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

All study area intersections are projected to operate at an acceptable LOS in the horizon year without the project traffic as shown in Tables 2 and 3. Additionally, all the roadways will carry a daily volume of traffic that is consistent with the adjusted daily volumes in the Aurora Highlands TIS from August 2019 and NEATS. Figure 11 shows the factors derived from the new study on Powhatan Road that were used to adjust the 2040 background traffic as well as the adjusted volumes.

Figure 11. MTIS Adjusted 2040 Background Daily Traffic



Turn lane requirements for the horizon background conditions were evaluated based on the State Highway Access Code (SHAC) and the City of Aurora specifications. The results are summarized in Table 4.

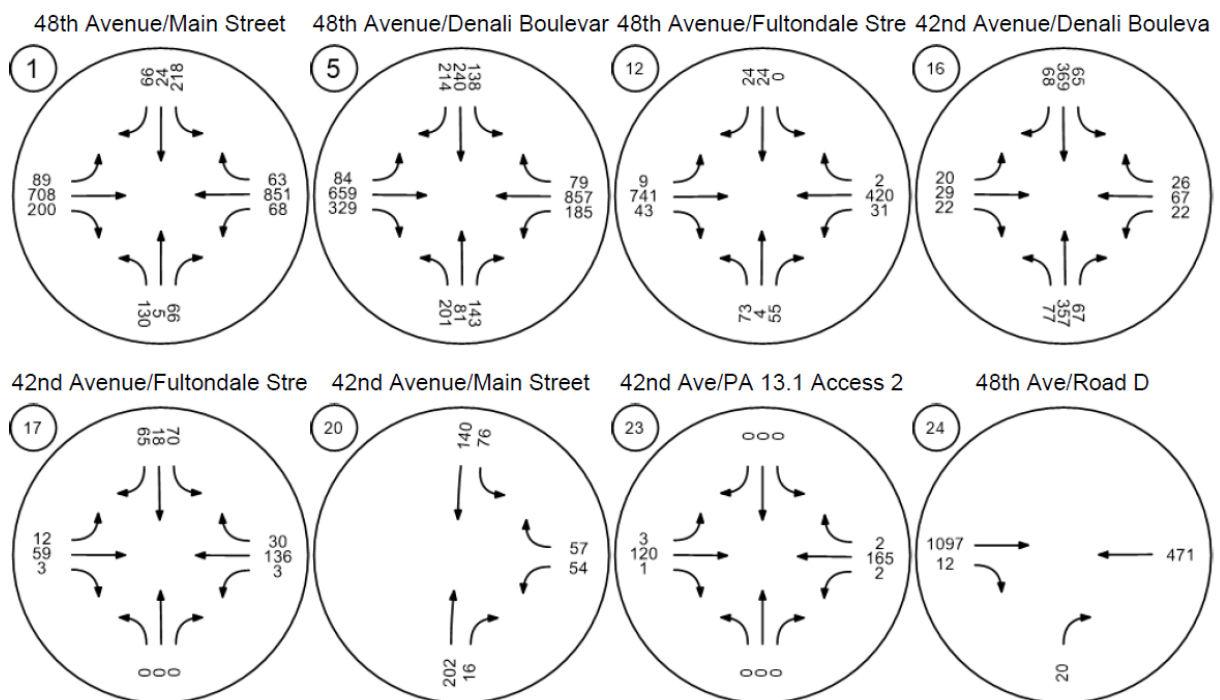
Table 4. Horizon Background Turn Lane Evaluations

ID	Intersection	Movement	# of Lanes	Access Category	Speed Limit (mph)	Turning Vol	Lane Width	SHAC	Lane	Storage	Taper Length	COA min Storage+ Decel	Recommended
1	48th Ave/Main St	NBL	2	NR-C	35	99	12	220		100	120	150	270
		NBR	1	NR-C	35	86	12	220		100	120		220
		SBL	2	NR-C	35	218	12	230		109	120	150	270
		SBR	1	NR-C	35	66	12	220		100	120		220
		EBL	2	NR-A	45	166	12	535	435	100		200	535
		EBR	1	NR-A	45	189	12	435	435				435
		WBL	2	NR-A	45	114	12	485	435	50		200	485
5	48th Ave/Denali Bl	WBR	1	NR-A	45	182	12	435	435				435
		NBL	2	NR-B	40	201	12	245		101	144	200	344
		NBR	1	NR-B	40	143	12	285		143	144		285
		SBL	1	NR-B	40	135	12	280		138	144	200	344
		SBR	1	NR-B	40	301	12	445		301	144		445
		EBL	2	NR-A	45	89	12	485	435	50		200	485
		EBR	1	NR-A	45	329	12	435	435				435
12	48th Ave/Fultandale St	WBL	2	NR-A	45	285	12	580	435	143		200	580
		WBR	1	NR-A	45	85	12	435	435				435
		NBL	2	NR-C	35	73	12	170		50	120	150	270
		NBR	1	NR-C	35	49	12	170		50	120		170
		EBL	1	NR-A	45	11	12	460	435	25		200	460
		EBR	1	NR-A	45	125	12	435	435				435
16	Denali Bl/42nd Ave	WBL	2	NR-A	45	59	12	460	435	25		200	460
		NBL	1	NR-B	40	80	12	245		100	144	200	344
		NBR	1	NR-B	40	74	12	245		100	144		245
		SBL	1	NR-B	40	63	12	245		100	144	200	344
17	42nd Ave/Fultondale St	SBR	1	NR-B	40	68	12	245		100	144		245
		SBL	1	NR-C	35	69	12	220		100	120	150	270
		SBR	1	NR-C	35	69	12	220		100	120		220
		NBR	1	NR-C	35	53	12	170		50	120		170
20	Main St/42nd Ave	SBL	1	NR-C	35	65	12	220		100	120	150	270
46	48th Ave/Harvest Rd												
		SBL	2	NR-B	40	517	12	405		259	144	200	405
		EBL	2	NR-A	45	464	12	665	435	232		200	665
		WBR	1	NR-B	45	242	12	435	435				435
47	48th Ave/Powhatan Rd	NBL	3	NR-A	45	200	12	535	435	100		200	535
		NBR	1	NR-A	45	100	12	435	435				435
		SBL	2	NR-A	45	10	12	460	435	25		200	460
		SBR	1	NR-A	45	90	12	435	435	25			435
		EBL	2	NR-B	45	200	12	435	435			200	435
												200	200
		WBL	2	NR-B	45	60	12	435	435			200	435
48	38th Pkwy/Powhatan Rd	WBR	1	NR-B	45	40	12	435	435				435
		NBL	1	NR-A	45	152	12	585	435	152		200	585
		NBR	1	NR-A	45	614	12	435	435				435
		SBL	1	NR-A	45	64	12	535	435	100		200	535
		SBR	1	NR-A	45	65	12	435	435				435
		EBR	1	NR-C	40	83	12	245		100	144	150	245
		WBL	2	NR-C	40	597	12	445		299	144	150	445
		WBR	1	NR-C	40	406	12	550		406	144		550

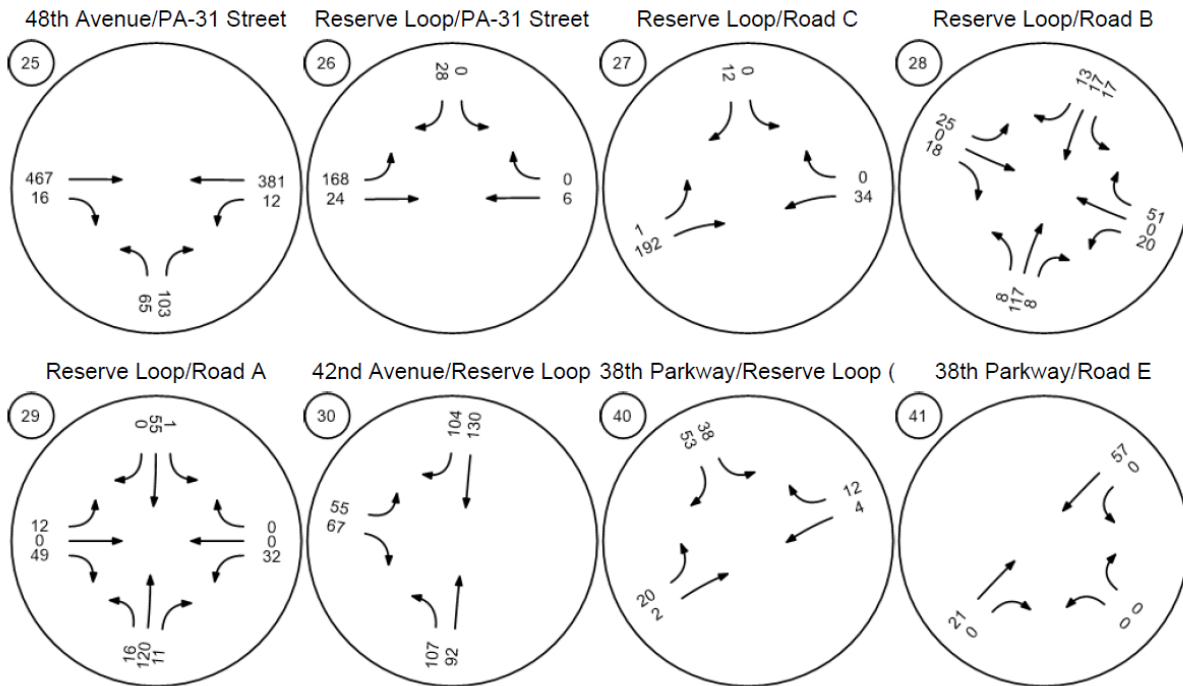
Horizon (2040) Year With Project Conditions

When the project traffic is added to the 2040 background traffic, the resulting AM Peak Hour, PM peak hour and Daily traffic volumes are as shown in Figures 12, 13 and 14.

Figure 12. Horizon Total Traffic Volumes (AM Peak Hour)



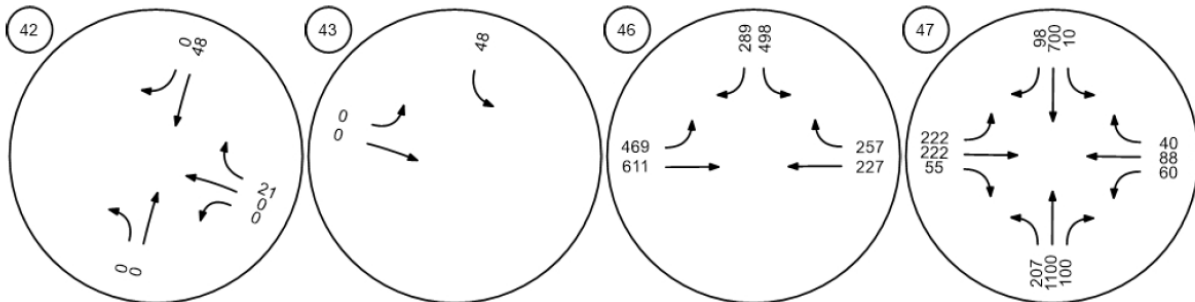
Horizon Total Traffic Volumes (AM Peak Hour). Continued



Horizon Total Traffic Volumes (AM Peak Hour). Continued



The Aurora Highlands Parkw The Aurora Highlands Parkw 48th Avenue/Harvest Road 48th Avenue/Powhatan Road



38th Parkway/Powhatan Roa

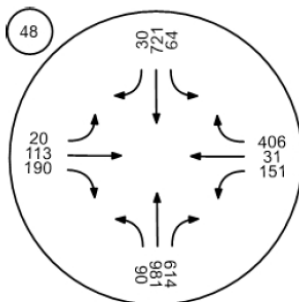
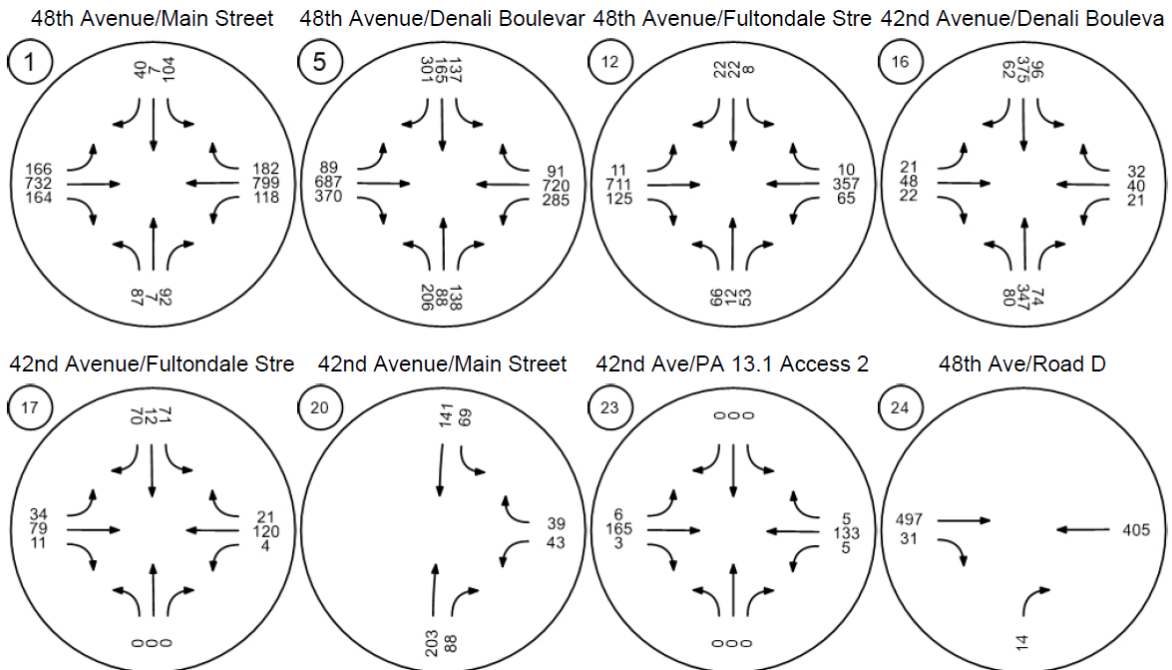
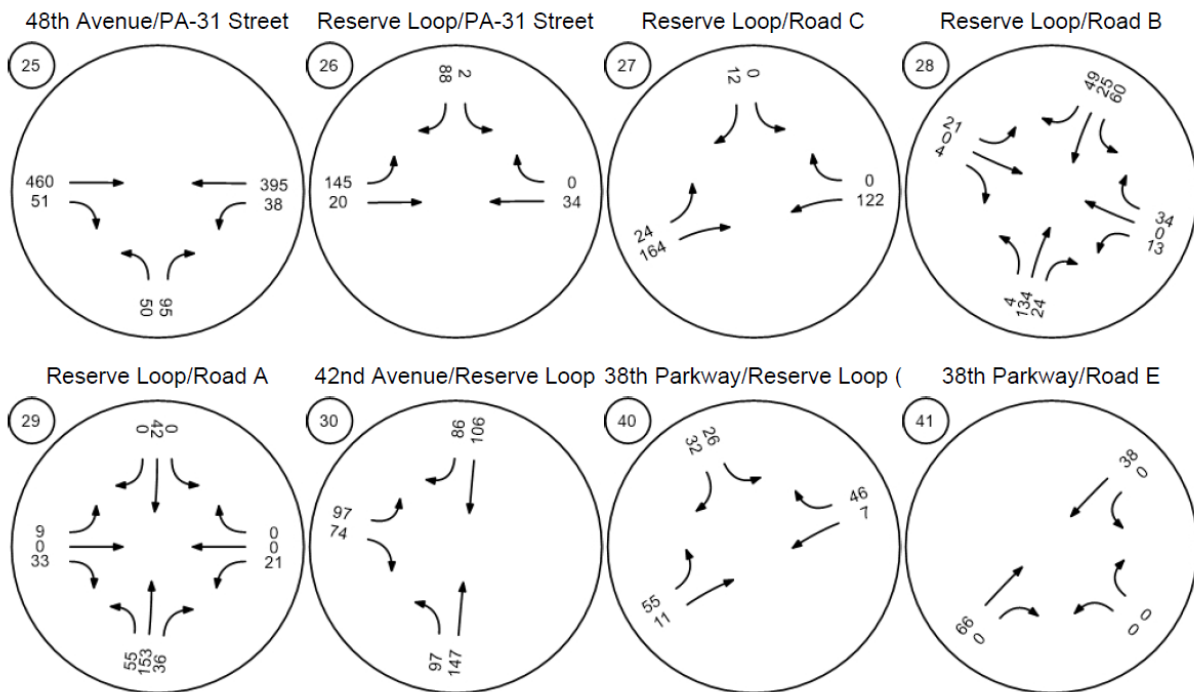


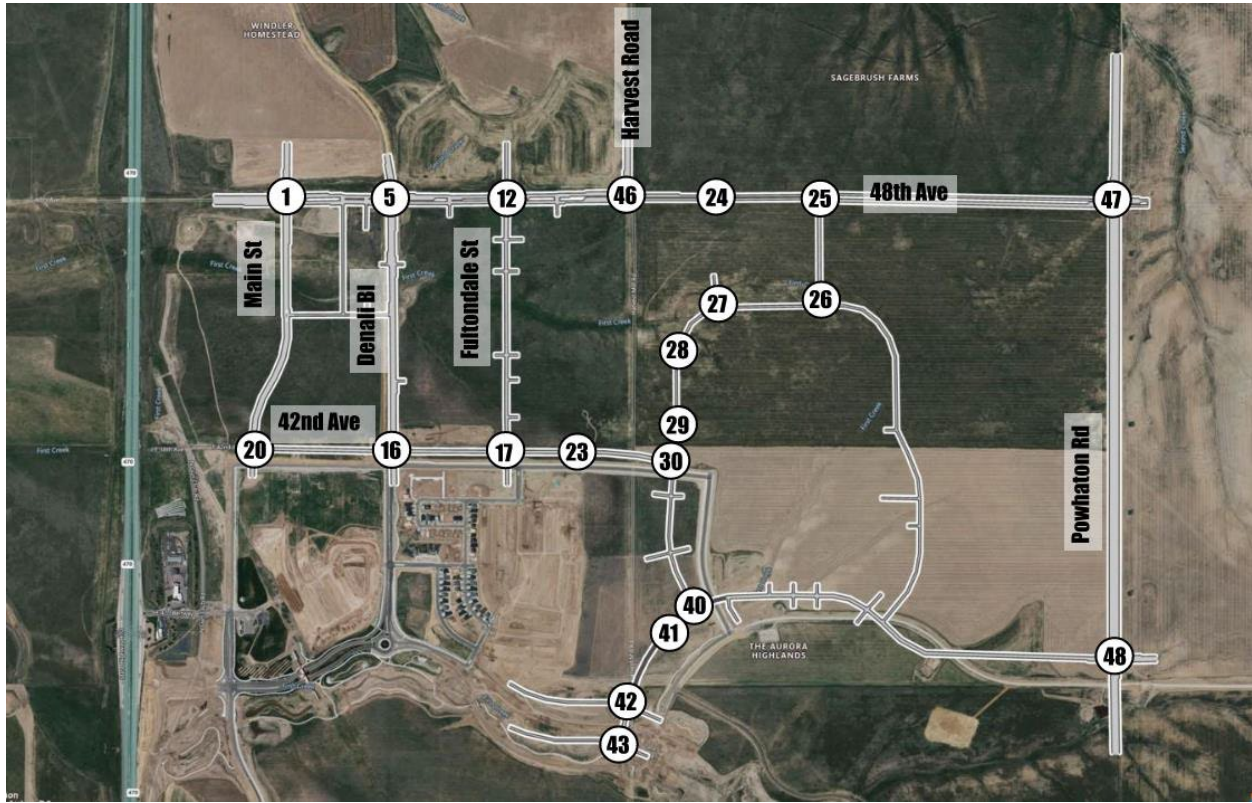
Figure 13. Horizon With Project Traffic Volumes (PM Peak Hour)



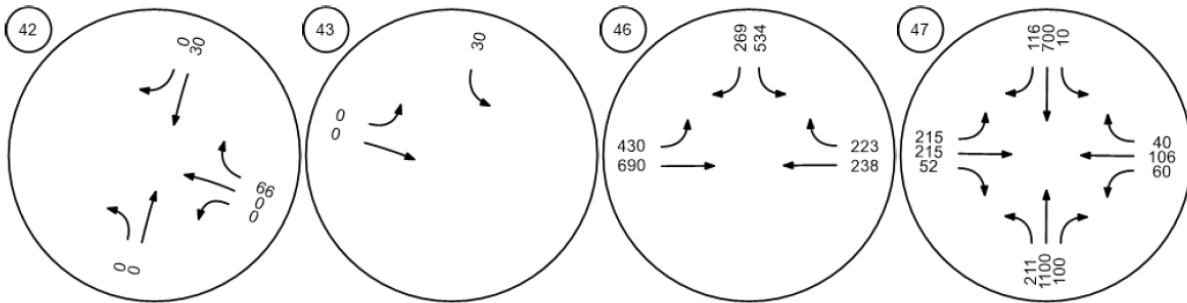
Horizon With Project Traffic Volumes (PM Peak Hour). Continued



Horizon With Project Traffic Volumes (PM Peak Hour). Continued



The Aurora Highlands Parkw The Aurora Highlands Parkw 48th Avenue/Harvest Road 48th Avenue/Powhatan Road



38th Parkway/Powhatan Roa

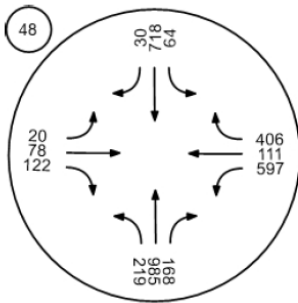
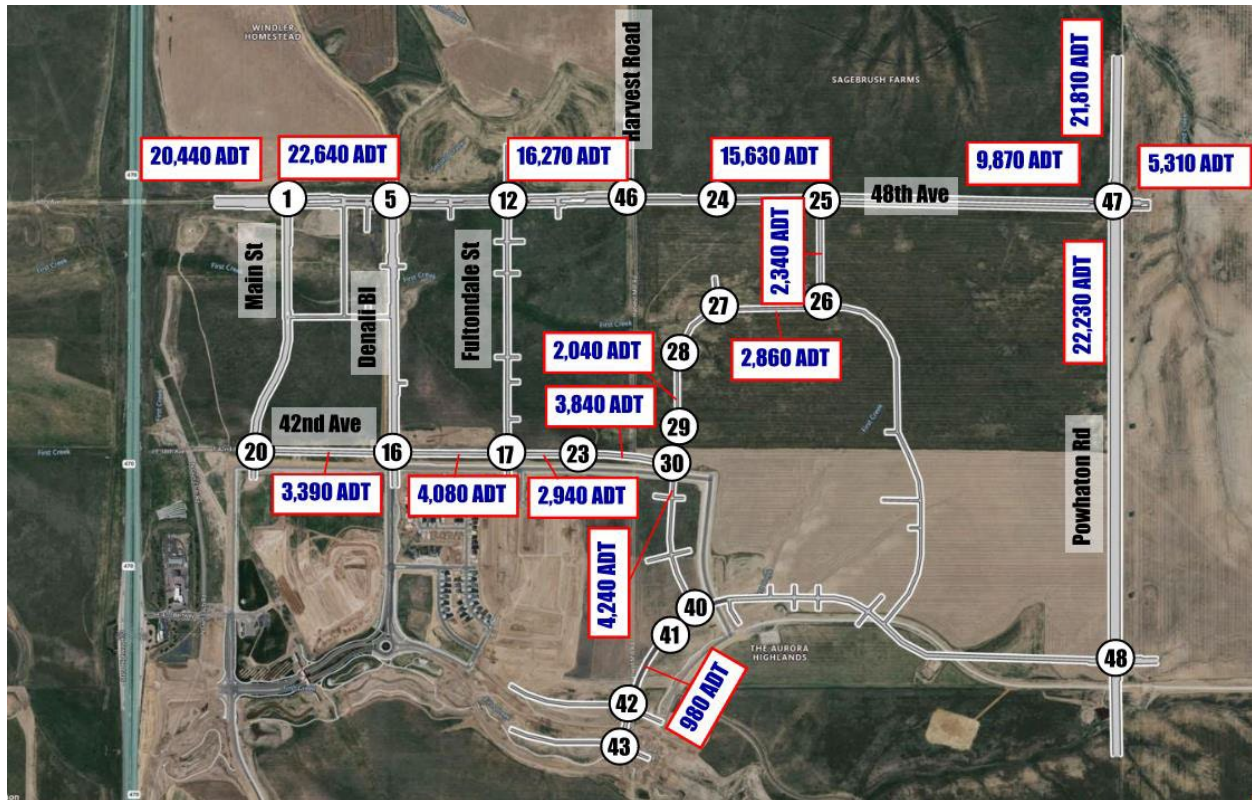


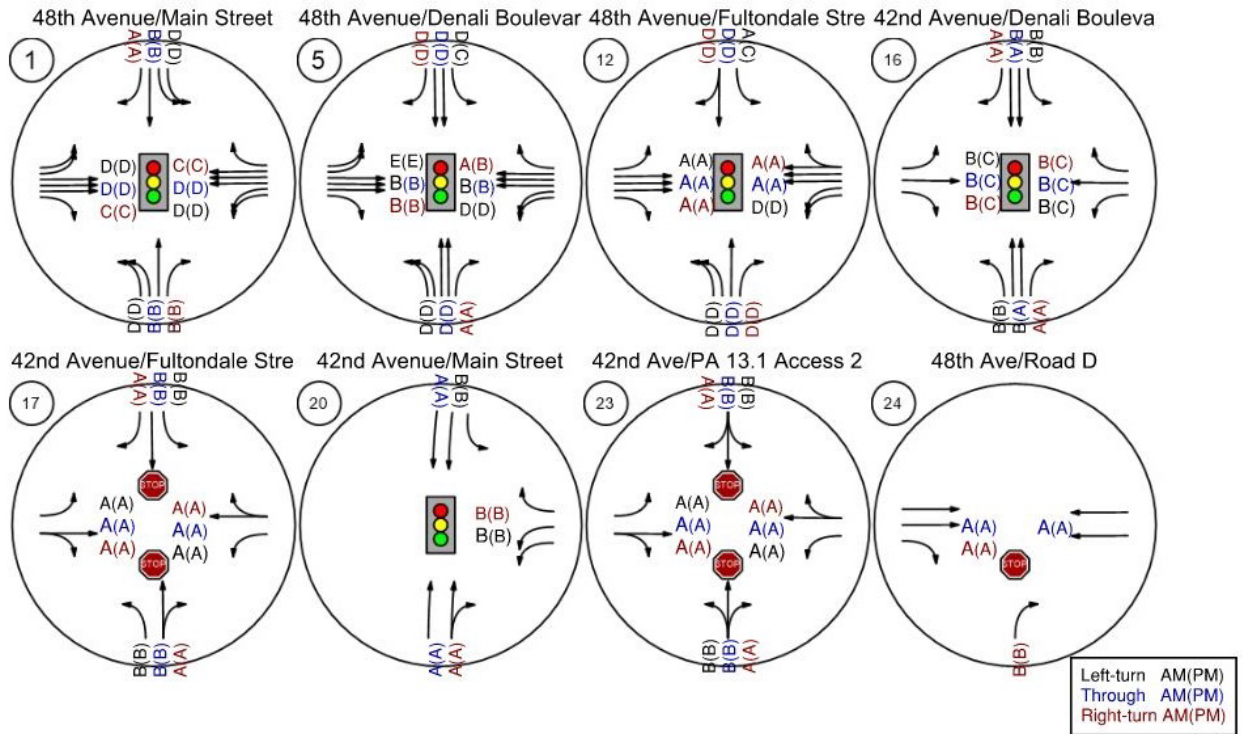
Figure 14. Horizon With Project Total Daily Traffic Volumes



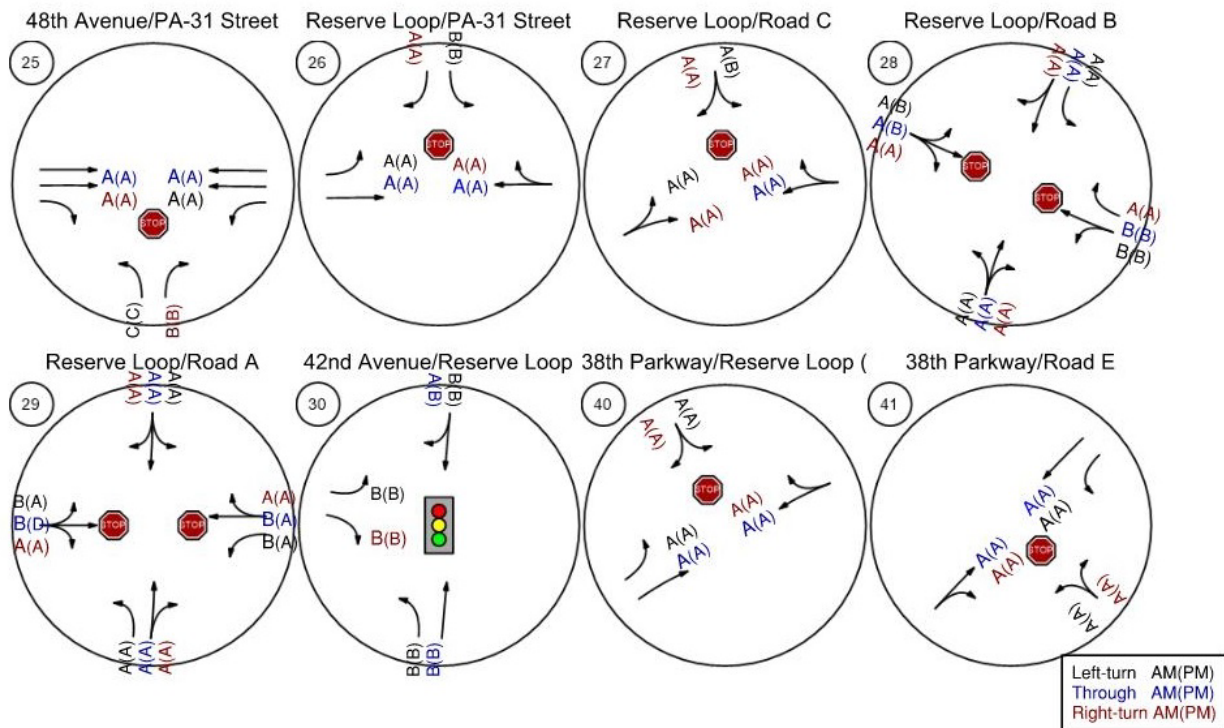
Assumed intersection configurations for the study area intersections and LOS are shown in Figure 15.

Analysis of the intersections and roadways for build out conditions with the volumes and configurations shown above results in the operations shown in Table 5 and Table 6.

Figure 15. Horizon With Project Intersection Configurations And LOS



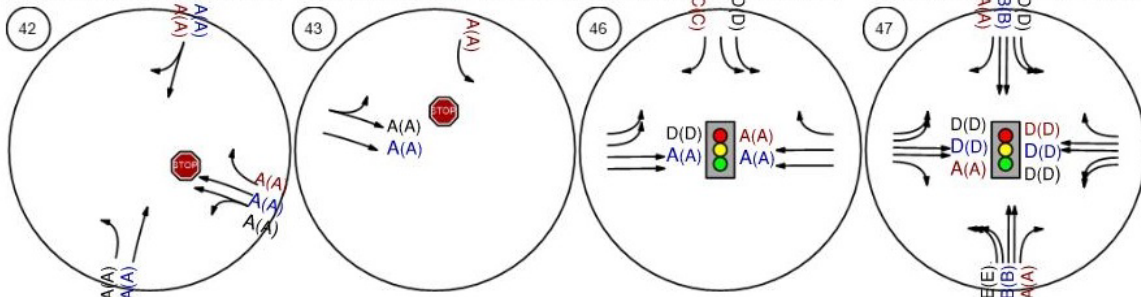
Horizon With Project Intersection Configurations and LOS. Continued



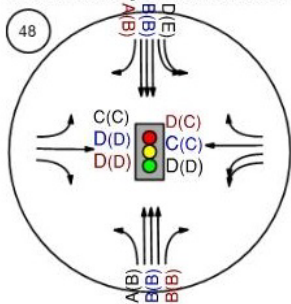
Horizon With Project Intersection Configurations and LOS. Continued



The Aurora Highlands Parkw The Aurora Highlands Parkw 48th Avenue/Harvest Road 48th Avenue/Powhatan Road



38th Parkway/Powhatan Roa



Left-turn	AM(PM)
Through	AM(PM)
Right-turn	AM(PM)

Table 5. Horizon Total Intersection Operations (AM Peak Hour)

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	48th Avenue/Main Street	Signalized	HCM 7th Edition	EB Left	0.334	39.1	D
5	48th Avenue/Denali Boulevard	Signalized	HCM 7th Edition	EB Left	0.384	26.0	C
12	48th Avenue/Fultondale Street	Signalized	HCM 7th Edition	NB Left	0.236	10.3	B
16	42nd Avenue/Denali Boulevard	Signalized	HCM 7th Edition	NB Left	0.169	11.9	B
17	42nd Avenue/Fultondale Street	Two-way stop	HCM 7th Edition	SB Thru	0.032	11.2	B
20	42nd Avenue/Main Street	Signalized	HCM 7th Edition	SB Left	0.101	9.7	A
23	42nd Ave/PA 13.1 Access 2	Two-way stop	HCM 7th Edition	EB Left	0.002	7.6	A
24	48th Ave/Road D	Two-way stop	HCM 7th Edition	NB Right	0.050	13.6	B
25	48th Avenue/PA-31 Street	Two-way stop	HCM 7th Edition	NB Left	0.207	18.2	C
26	Reserve Loop/PA-31 Street	Two-way stop	HCM 7th Edition	SB Right	0.028	8.4	A
27	Reserve Loop/Road C	Two-way stop	HCM 7th Edition	SB Right	0.013	8.5	A
28	Reserve Loop/Road B	Two-way stop	HCM 7th Edition	EB Left	0.041	10.7	B
29	Reserve Loop/Road A	Two-way stop	HCM 7th Edition	WB Left	0.054	10.9	B
30	42nd Avenue/Reserve Loop	Signalized	HCM 7th Edition	EB Left	0.231	11.1	B
40	38th Parkway/Reserve Loop (W)	Two-way stop	HCM 7th Edition	SB Left	0.044	9.2	A
41	38th Parkway/Road E	Two-way stop	HCM 7th Edition	WB Thru	0.001	0.0	A
42	The Aurora Highlands Parkway/38th Parkway	Two-way stop	HCM 7th Edition	WB Right	0.021	8.4	A
43	The Aurora Highlands Parkway/38th Parkway	Two-way stop	HCM 7th Edition	SB Left	0.051	8.7	A
46	48th Avenue/Harvest Road	Signalized	HCM 7th Edition	EB Left	0.323	26.6	C
47	48th Avenue/Powhatan Road	Signalized	HCM 7th Edition	SB Left	0.484	22.2	C
48	38th Parkway/Powhatan Road	Signalized	HCM 7th Edition	SB Left	0.421	19.4	B

Table 6. Horizon Total Intersection Operations (PM Peak Hour)

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	48th Avenue/Main Street	Signalized	HCM 7th Edition	NB Left	0.318	39.7	D
5	48th Avenue/Denali Boulevard	Signalized	HCM 7th Edition	EB Left	0.448	28.3	C
12	48th Avenue/Fultondale Street	Signalized	HCM 7th Edition	NB Left	0.237	11.5	B
16	42nd Avenue/Denali Boulevard	Signalized	HCM 7th Edition	WB Left	0.158	10.6	B
17	42nd Avenue/Fultondale Street	Two-way stop	HCM 7th Edition	SB Thru	0.022	11.7	B
20	42nd Avenue/Main Street	Signalized	HCM 7th Edition	SB Left	0.100	9.7	A
23	42nd Ave/PA 13.1 Access 2	Two-way stop	HCM 7th Edition	WB Left	0.004	7.6	A
24	48th Ave/Road D	Two-way stop	HCM 7th Edition	NB Right	0.021	10.2	B
25	48th Avenue/PA-31 Street	Two-way stop	HCM 7th Edition	NB Left	0.181	19.7	C
26	Reserve Loop/PA-31 Street	Two-way stop	HCM 7th Edition	SB Left	0.004	11.4	B
27	Reserve Loop/Road C	Two-way stop	HCM 7th Edition	SB Right	0.014	9.0	A
28	Reserve Loop/Road B	Two-way stop	HCM 7th Edition	EB Left	0.043	12.1	B
29	Reserve Loop/Road A	Two-way stop	HCM 7th Edition	WB Left	0.042	11.9	B
30	42nd Avenue/Reserve Loop	Signalized	HCM 7th Edition	NB Thru	0.270	11.8	B
40	38th Parkway/Reserve Loop (W)	Two-way stop	HCM 7th Edition	SB Left	0.035	9.8	A
41	38th Parkway/Road E	Two-way stop	HCM 7th Edition	EB Thru	0.001	0.0	A
42	The Aurora Highlands Parkway/38th Parkway	Two-way stop	HCM 7th Edition	WB Right	0.066	8.6	A
43	The Aurora Highlands Parkway/38th Parkway	Two-way stop	HCM 7th Edition	SB Left	0.032	8.6	A
46	48th Avenue/Harvest Road	Signalized	HCM 7th Edition	EB Left	0.358	25.5	C
47	48th Avenue/Powhatan Road	Signalized	HCM 7th Edition	SB Left	0.488	22.2	C
48	38th Parkway/Powhatan Road	Signalized	HCM 7th Edition	SB Left	0.515	27.2	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

All intersections operate at an acceptable level of service in the horizon year with the addition of the project.

Turn lane requirements for the horizon with addition of the project were evaluated and results are summarized in Table 7.

Table 7. Horizon With Project Turn Lane Evaluations

ID	Intersection	Movement	# of Lanes	Access	Speed Limit (mph)	Turning Vol	Lane Width	SHAC	Lane	Storage	Taper Length	COA Min Storage+Decel Lane	Recommended	Improvement
1	48th Ave/Main St	NBL	2	NR-C	35	130	12	220		100	120	150	270	
		NBR	1	NR-C	35	92	12	220		100	120		220	
		SBL	2	NR-C	35	218	12	230		109	120	150	270	
		SBR	1	NR-C	35	66	12	220		100	120		220	
		EBL	2	NR-A	45	166	12	535	435	100		200	535	
		EBR	1	NR-A	45	200	12	435	435				435	
		WBL	2	NR-A	45	118	12	485	435	50		200	485	
5	48th Ave/Denali Bl	WBR	1	NR-A	45	182	12	435	435				435	
		NBL	2	NR-B	40	206	12	245		103	144	200	344	
		NBR	1	NR-B	40	143	12	285		143	144		285	
		SBL	1	NR-B	40	138	12	280		138	144	200	344	
		SBR	1	NR-B	40	301	12	445		301	144		445	
		EBL	2	NR-A	45	89	12	485	435	50		200	485	
		EBR	1	NR-A	45	370	12	435	435				435	
12	48th Ave/Fultondale St	WBL	2	NR-A	45	285	12	580	435	143		200	580	
		WBR	1	NR-A	45	91	12	435	435				435	
		NBL	2	NR-C	35	73	12	170		50	120	150	270	
		NBR	1	NR-C	35	55	12	170		50	120		170	
		EBL	1	NR-A	45	11	12	460	435	25		200	460	
		EBR	1	NR-A	45	125	12	435	435				435	
16	Denali Bl/42nd Ave	WBL	2	NR-A	45	65	12	485	435	50		200	485	25
		NBL	1	NR-B	40	80	12	245		100	144	200	344	
		NBR	1	NR-B	40	74	12	245		100	144		245	
		SBL	1	NR-B	40	96	12	245		100	144	200	344	
		SBR	1	NR-B	40	68	12	245		100	144		245	
		SBL	1	NR-C	35	71	12	220		100	120	150	270	
		SBR	1	NR-C	35	70	12	220		100	120		220	
17	42nd Ave/Fultondale St	EBL	1	NR-C	35	34	12	170		50	120	150	270	70
		NBR	1	NR-C	35	88	12	220		100	120		220	50
		SBL	1	NR-C	35	76	12	220		100	120	150	270	
		WBL	2	NR-C	35	54	12	145		25	120	150	270	270
		EBR	1	NR-B	45	34	12	435	435				435	435
		NBL	1	NR-C	35	65	12	220		100	120	150	270	270
25	48th Ave/PA-31 St	EBR	1	NR-B	45	51	12	435	435				435	435
		WBL	1	NR-B	45	38	12	435	435			200	435	435
		EBL	1	NR-C	35	168	12	290		168	120	150	290	20
		SBL	1	NR-C	35	60	12	170		50	120	150	270	270
		WBR	1	NR-C	30	51	12	145		50	96		145	145
		NBL	1	NR-C	35	55	12	170		50	120	150	270	270
		WBL	1	NR-C	30	32	12	145		50	96	150	246	246
30	42nd Ave/Reserve Loop	EBL	1	NR-C	35	55	12	170		50	120	150	270	
		NBL	1	NR-C	35	107	12	225		107	120	150	270	
		WBR	1	NR-C	40	66	12	220		100	120		220	20
		SBL	2	NR-B	40	534	12	410		267	144	200	410	5
		EBL	2	NR-A	45	469	12	670	435	235		200	670	5
		WBR	1	NR-B	45	257	12	435	435				435	
		NBL	2	NR-A	45	211	12	535	435	100		200	535	
47	48th Ave/Powhatan Rd	NBR	1	NR-A	45	100	12	435	435				435	
		SBL	2	NR-A	45	10	12	460	435	25		200	460	
		SBR	1	NR-A	45	116	12	435	435				435	
		EBL	2	NR-B	45	222	12	435	435			200	435	
		EBR	1	NR-B	45	55	12	435	435				435	235
		WBL	2	NR-B	45	60	12	435	435			200	435	
		WBR	1	NR-B	45	40	12	435	435				435	
48	38th Pkwy/Powhatan Rd	NBL	1	NR-A	45	219	12	655	435	219		200	655	70
		NBR	1	NR-A	45	614	12	435	435				435	
		SBL	1	NR-A	45	64	12	535	435	100		200	535	
		SBR	1	NR-A	45	30	12	435	435				435	
		EBR	1	NR-C	40	190	12	335		190	144		335	90
		WBL	2	NR-C	40	597	12	445		299	144	150	445	
		WBR	1	NR-C	40	406	12	550		406	144		550	

Conclusions and Recommendations

The development of the Aurora Highlands, North Area, Area B has been studied for traffic impacts to the assumed roadway network. The roadway network assumptions were developed from a combination of *The Aurora Highlands Traffic Impact Study, August 2019*, the *Windler Master Plan Master Traffic Study, October 2021*, and the *ATEC Traffic Impact Analysis, November 2019*, *The Aurora Highlands Filings 4 & 5 and Future Filing North of Filing 5, April 2020*, *The Aurora Highlands Filings 1 & 2 and Planning Areas 21 and 38, July 2019* and *Powhaton Road Alignment Study, 2022*. The recommended turn lanes are listed below (total lanes were rounded to the nearest 5-ft).

2040 Background Conditions

48th Avenue/Main Street (#1)

- Two 270-ft northbound left-turn. Included a 150-ft storage plus deceleration lane based on the City of Aurora (COA) minimum requirement, and a 120-ft taper lane based on the SHAC.
- A 220-ft northbound right-turn. Included a 100-ft storage and a 120-ft taper.
- Two 270-ft southbound left-turn. Included a 150-ft storage and deceleration lane plus a 120-ft taper.
- A 220-ft southbound right-turn. Included a 100-ft storage and a 120-ft taper.
- Two 535-ft eastbound left-turn. (435-ft deceleration lane and 100-ft storage).
- A 435-ft eastbound right-turn deceleration lane.
- Two 485-ft westbound left-turn. (435-ft deceleration lane and 50-ft storage).
- A 435-ft westbound right-turn deceleration lane.

48th Avenue/Denali Boulevard (#5)

- Two 345-ft northbound left-turn (200ft storage and deceleration and 144-ft taper).
- A 285-ft northbound right-turn. Included a 143-ft storage and a 144-ft taper.
- A 345-ft southbound left-turn (200ft storage and deceleration and 144-ft taper).
- A 445-ft southbound right-turn. Included a 301-ft storage and a 144-ft taper.
- Two 485-ft eastbound left-turn (435-ft deceleration lane and a 143-ft storage)
- A 435-ft eastbound right-turn deceleration lane.
- Two 580-ft westbound left-turn (435-ft deceleration lane plus a 143-ft storage)
- A 435-ft westbound right-turn deceleration lane.

48th Avenue/Fultondale Street (#12)

- Two 270-ft northbound left-turn. Included a 150-ft storage and deceleration lane plus a 120-ft taper.
- A 170-ft northbound right-turn (50-ft storage and a 120-ft taper)
- A 460-ft eastbound left-turn (435-ft deceleration lane plus a 25-ft storage)
- A 435-ft eastbound right-turn deceleration lane.
- Two 460-ft westbound left-turn (435-ft deceleration lane plus a 25-ft storage)

Denali Boulevard/42nd Avenue (#16)

- A 345-ft northbound left-turn. Included a 200-ft storage and deceleration lane plus a 144-ft taper.
- A 245-ft northbound right-turn (100-ft storage and 144-ft taper)
- A 345-ft southbound left-turn. Included a 200-ft storage and deceleration lane plus a 144-ft taper.
- A 245-ft southbound right-turn (100-ft storage and 144-ft taper)

42nd Avenue/Fultondale Street (#17)

- A 270-ft southbound left-turn (150-ft storage and deceleration and 120-ft taper)
- A 220-ft southbound right-turn (100-ft storage and 120-ft taper)

Main Street/42nd Avenue (#20)

- A 170-ft northbound right-turn (50-ft storage and 120-ft taper)
- A 270-ft southbound left-turn (150-ft storage and deceleration and 120-ft taper)

48th Avenue/Harvest Road (#46)

- Two 405-ft southbound left-turn (259-ft storage and 144-ft taper)
- Two 665-ft eastbound left-turn (435-ft deceleration and 232-ft storage)
- A 435-ft westbound right-turn deceleration lane.

48th Avenue/Powhaton Road (#47)

- Two 535-ft northbound left-turn (435-ft deceleration lane and 100-ft storage)
- A 435-ft northbound right-turn deceleration lane.
- Two 460-ft southbound left-turn (435-ft deceleration lane and 25-ft storage)
- A 435-ft southbound right-turn deceleration lane.
- Two 435-ft eastbound left-turn deceleration lane.
- Two 435-ft westbound left-turn deceleration lane.
- A 435-ft westbound right-turn deceleration lane

38th Parkway/Powhaton Road (#48)

- A 585-ft northbound left-turn (435-ft deceleration lane and 152-ft storage)
- A 435-ft northbound right-turn deceleration lane.
- A 535-ft southbound left-turn (435-ft deceleration lane and 100-ft storage)
- A 435-ft southbound right-turn deceleration lane.
- A 245-ft southbound left-turn (150-ft storage and 144-ft taper)
- Two 445-ft westbound left-turn (299-ft storage and 144-ft taper)
- A 550-ft westbound right-turn (406-ft storage and 144-ft taper)

2040 With Project

48th Avenue/Fultondale Street (#12)

- A 25-ft extension of westbound left-turn

42nd Avenue/Fultondale Street (#17)

- A 70-ft extension of eastbound left-turn

Main Street/42nd Avenue (#20)

- A 50-ft extension of northbound right-turn
- A 270-ft westbound left-turn (150-ft storage and deceleration lane and 120-ft taper)

48th Avenue/Road D (#24)

- A 435-ft eastbound right-turn deceleration lane.

48th Avenue/PA-31 Street (#25)

- A 270-ft northbound left-turn (150-ft storage and deceleration lane and 120-ft taper)
- A 435-ft eastbound right-turn deceleration lane.
- A 435-ft westbound left-turn deceleration lane.

Reserve Loop/PA-31 Street (#26)

- A 20-ft extension of eastbound left-turn (270-ft background turn lane)

Reserve Loop/Road B (#28)

- A 270-ft northbound left-turn (150-ft storage and deceleration lane plus a 120-ft taper)
- A 145-ft westbound right-turn (50-ft storage and 120-ft taper)

Reserve Loop/Road A (#29)

- A 270-ft northbound left-turn (150-ft storage and deceleration lane and 120-ft taper)
- A 245-ft westbound left-turn (150-ft storage and deceleration plus a 96-ft taper)

TAH Parkway/38th Parkway (#42)

- A 20-ft extension of westbound right-turn (200-ft background lane)

48th Avenue/Harvest Road (#46)

- A 5-ft extension of southbound left-turn
- A 5-ft extension of eastbound left-turn

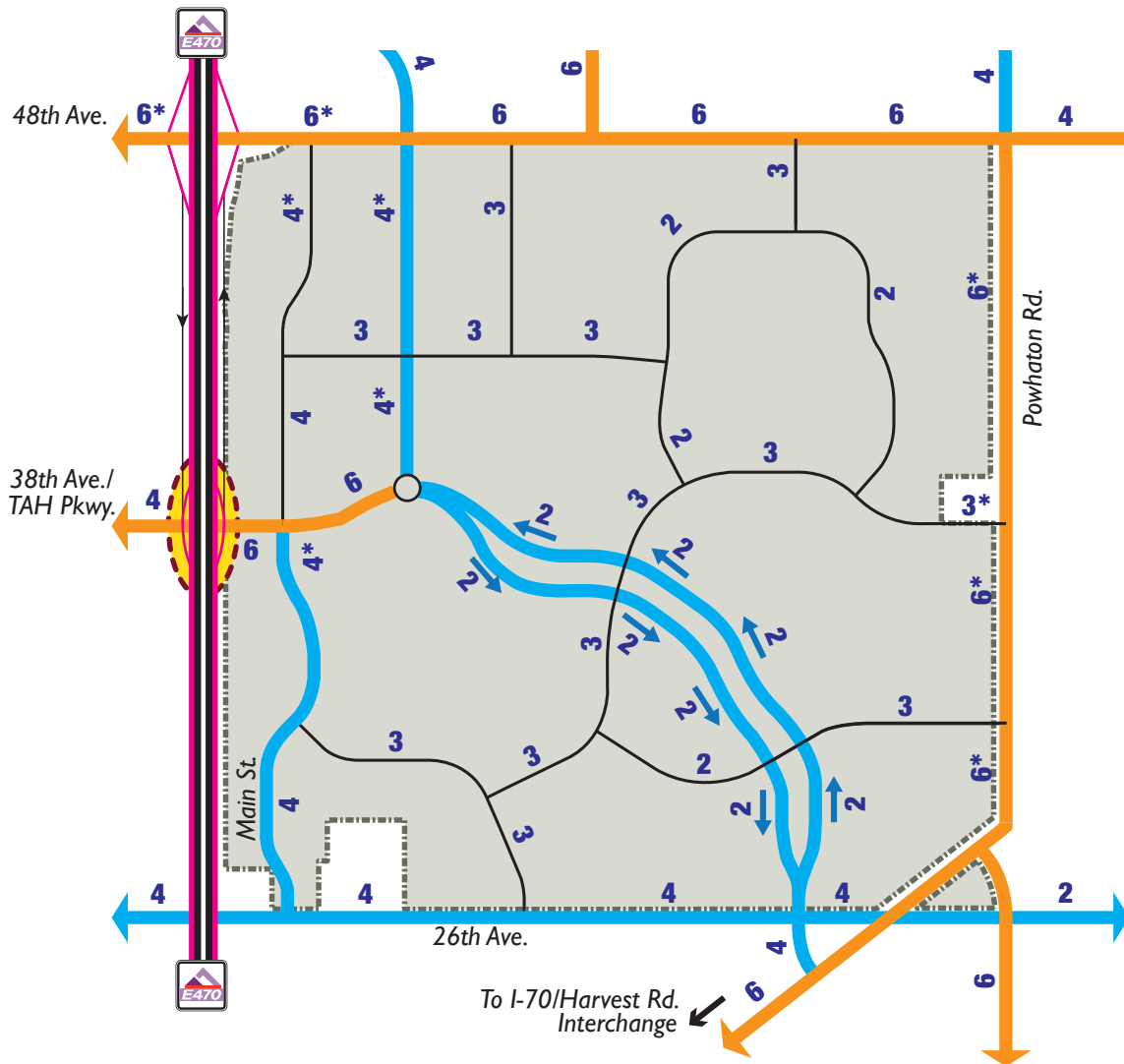
48th Avenue/Powhaton Road (#47)

- A 435-ft eastbound right-turn

38th Parkway/Powhaton Road (#48)

- A 70-ft extension of northbound left-turn
- A 90-ft extension of eastbound right-turn

Appendix A – Background Traffic Volumes



LEGEND

	= Tollway		= Divided Minor Arterial
	= Major Arterial		= Laneage
	= Minor Arterial		= Accel/Decel Lanes also Needed
	= Collector Roads (Subject to traffic calming measures at time of contextual site plan)		= Aurora Highlands
	= Potential Interchange		

NOTE:

Access Control and restrictions will along the arterial roadways in the proximity of E-470 interchanges be required.



FIGURE 5

Proposed 2040 Geometry - II

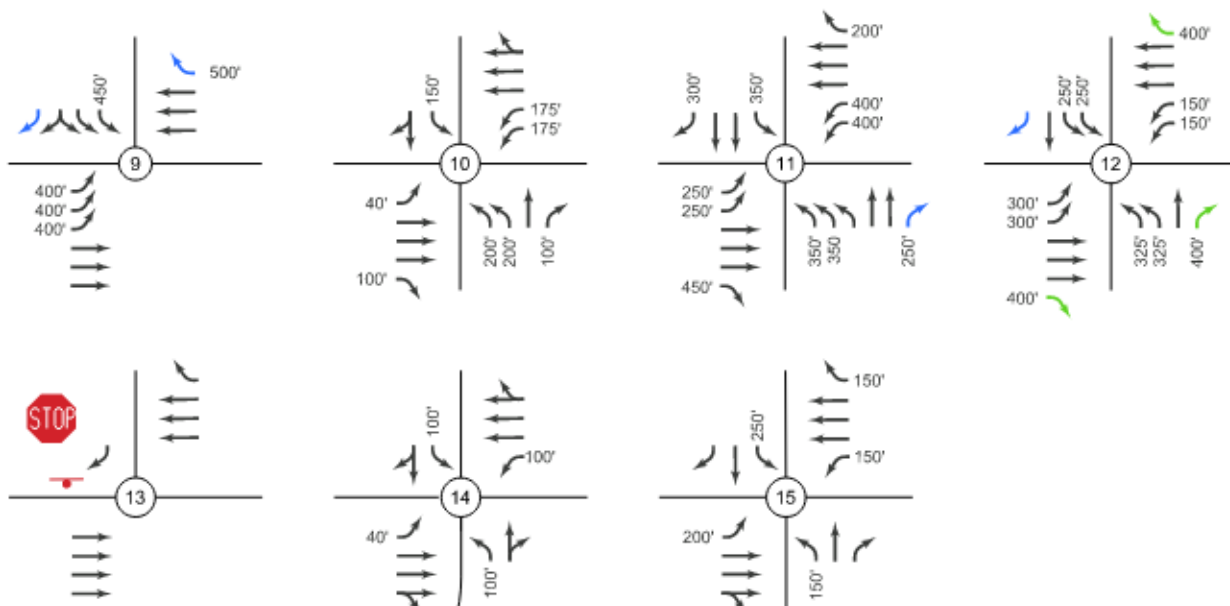
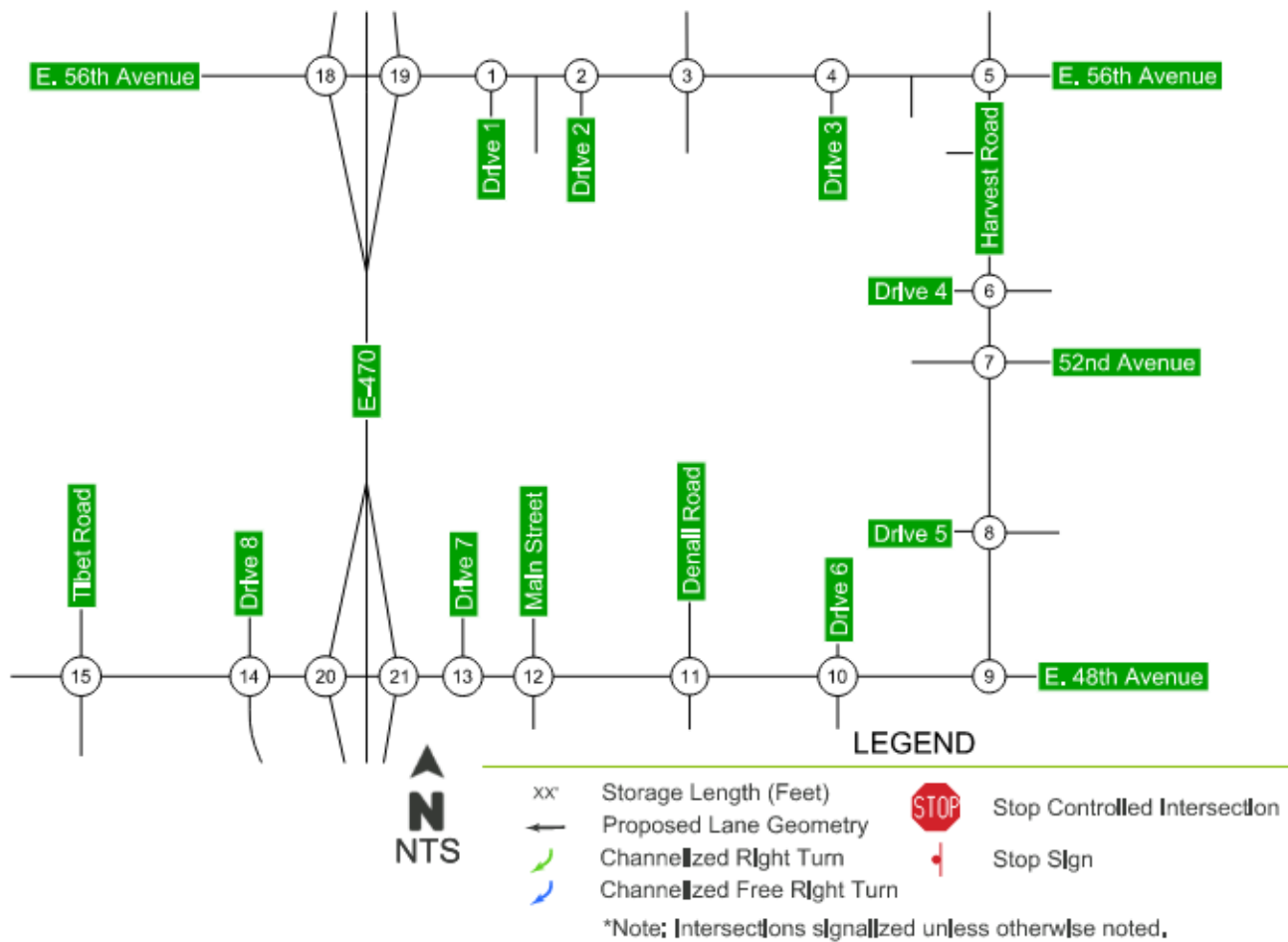
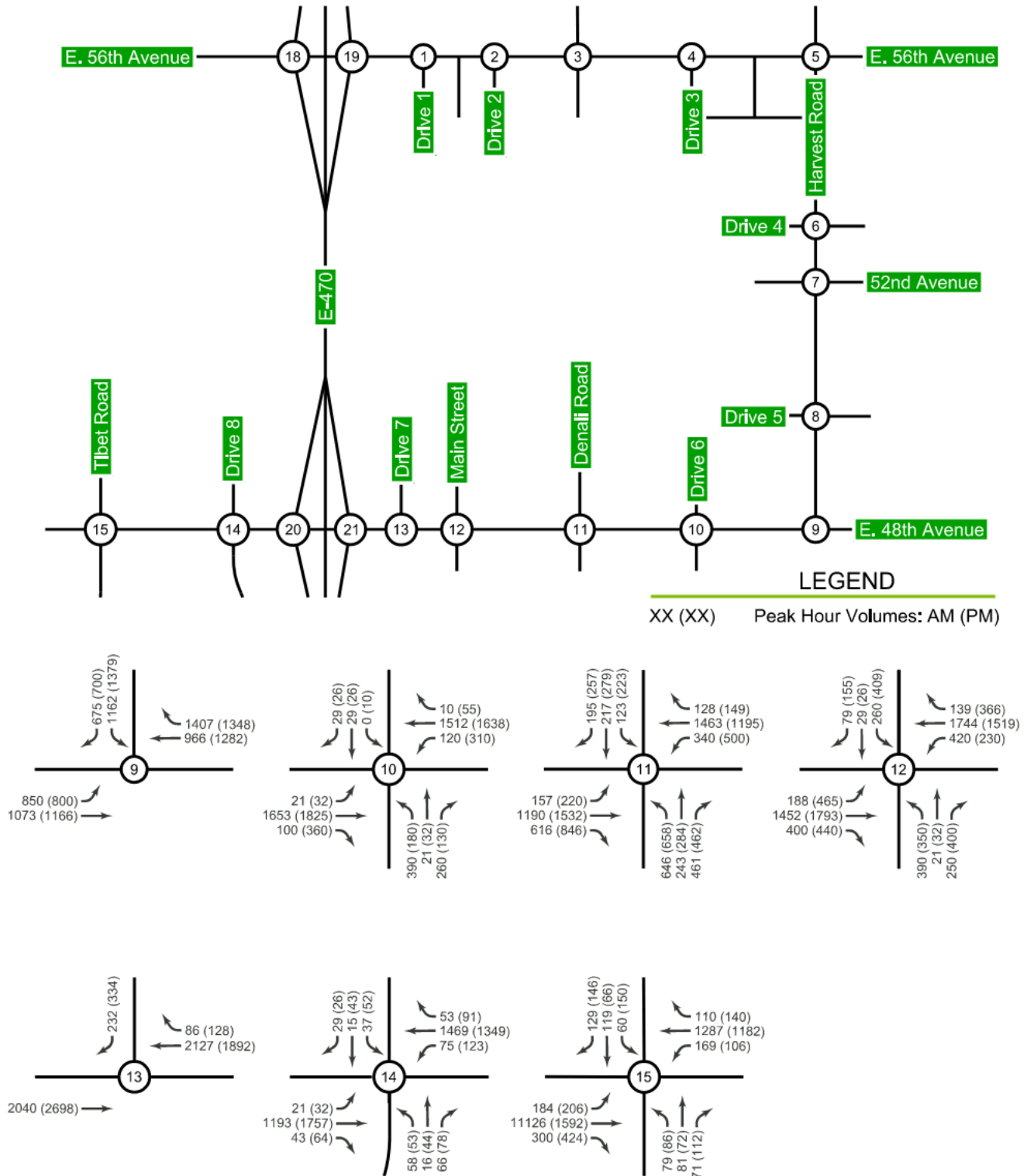
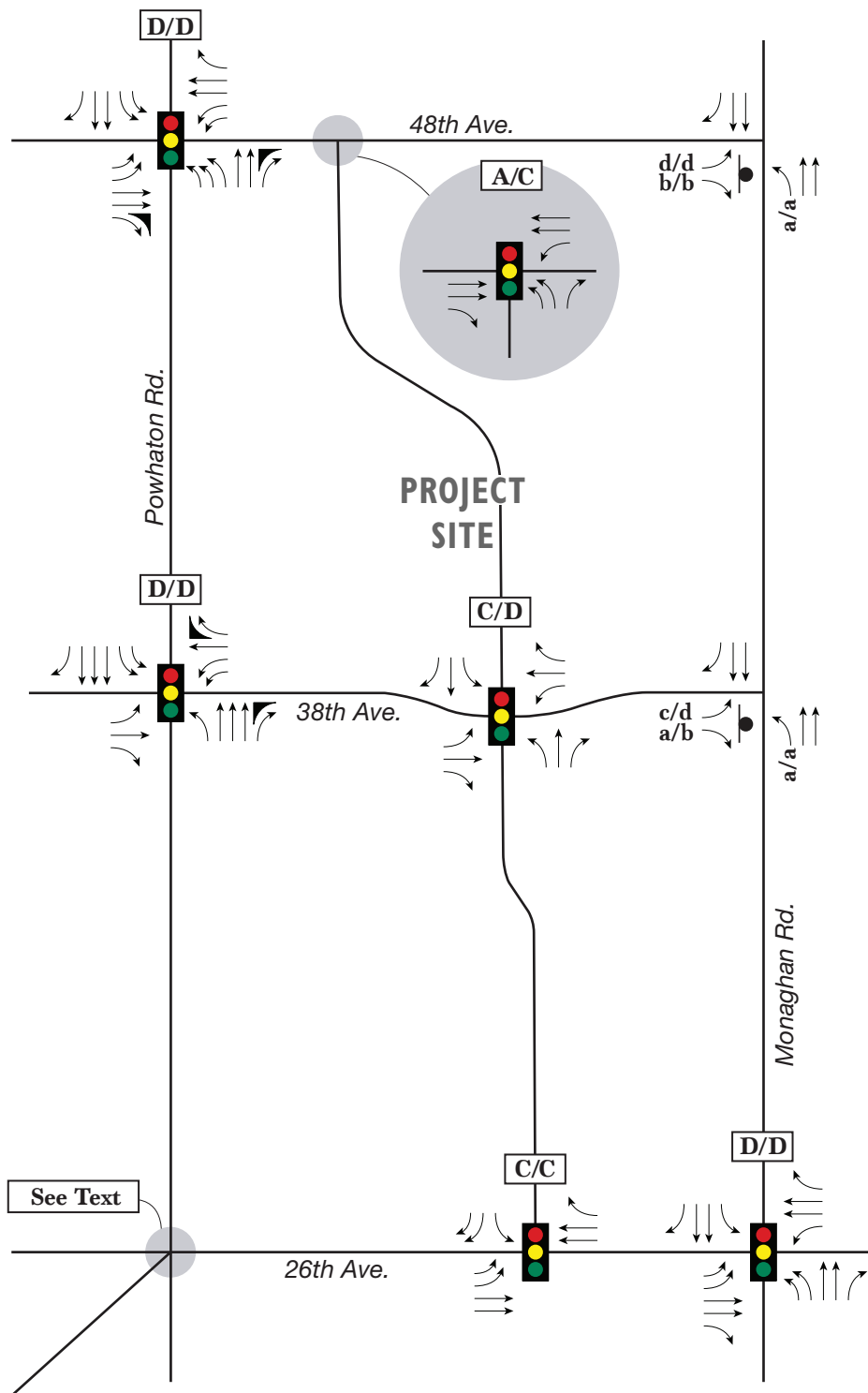


FIGURE 18

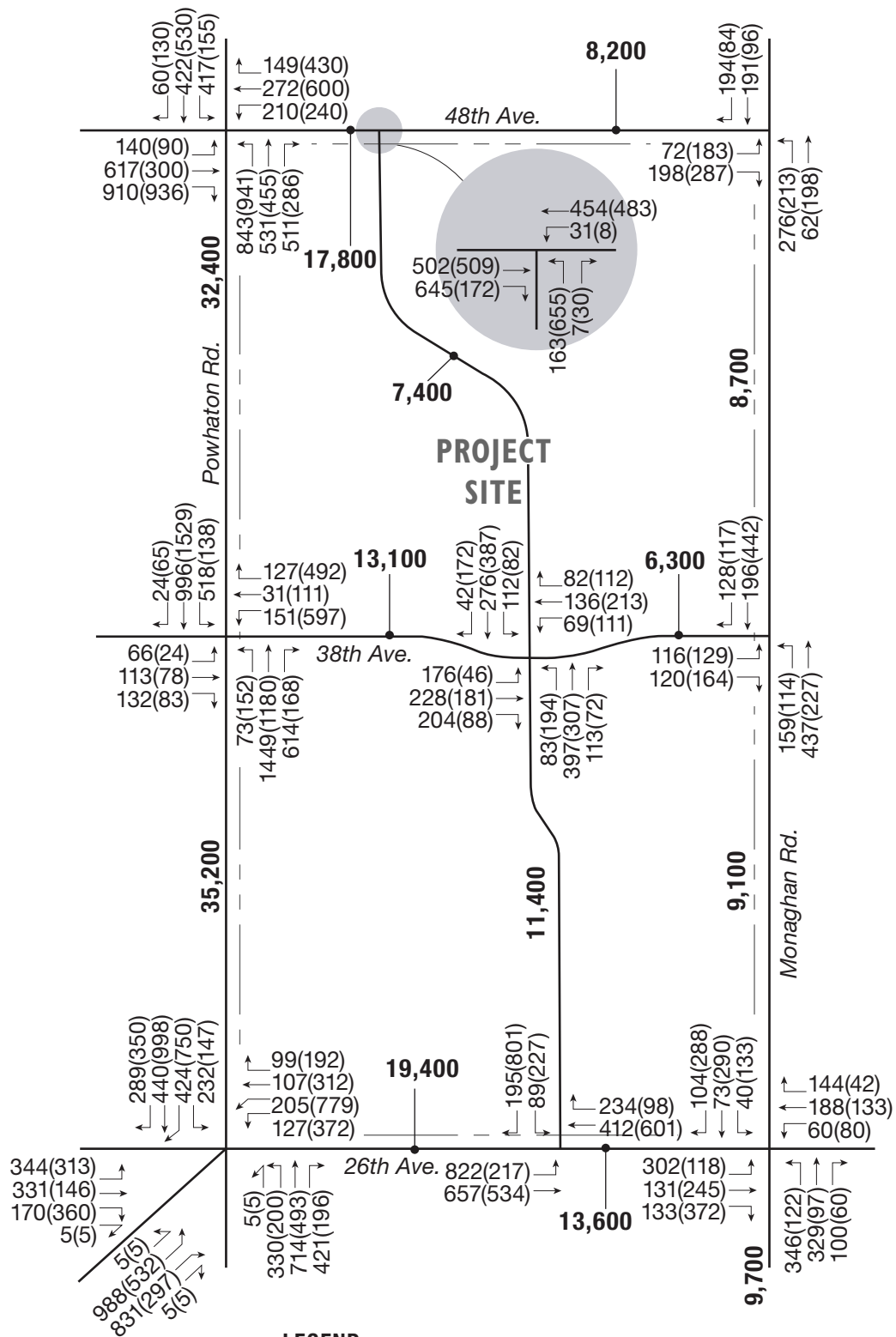
2040 Site Plus Background Traffic Volumes - II





LEGEND

- X/X = AM/PM Peak Hour Signalized Intersection Level of Service
- x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service
- = Stop Sign
- 🚦 = Traffic Signal



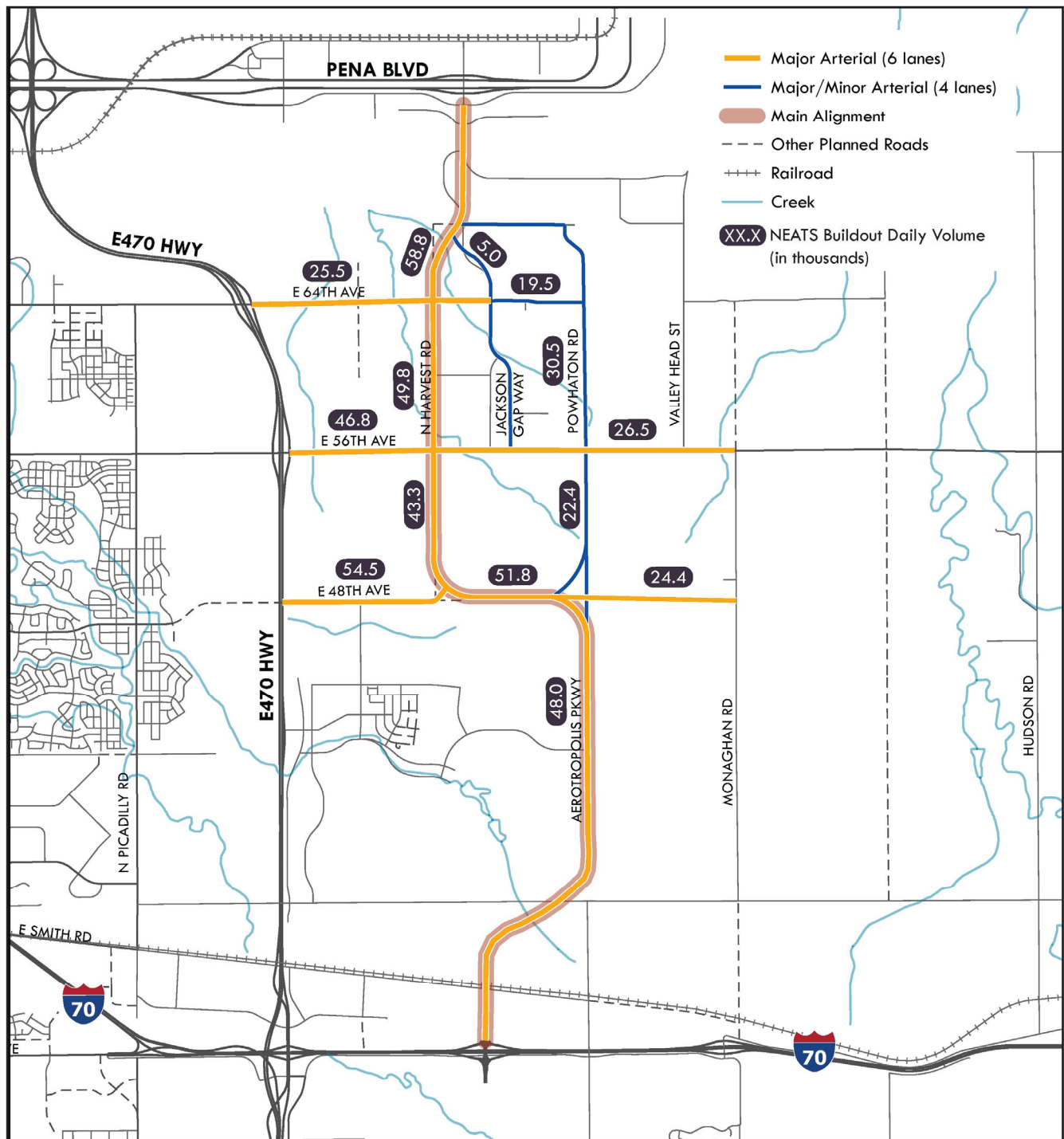
LEGEND

xxx(xxx) = AM(PM) Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

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Figure 6 | NEATS Buildout Volumes



NEATS Refresh, October 2018.

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Roadway Network Assumptions

Roadway capacity is defined as the maximum traffic volume that a roadway can carry at a desired level of service (LOS). Roadway capacity varies for different roadway types based on multiple geometric and operational factors. Facility laneage consistent with *NEATS Refresh* volume thresholds was determined for acceptable performance at Buildout (LOS D-E threshold) (see **Table 1**).

ROADWAY CLASSIFICATION	NUMBER OF LANES EACH DIRECTION	RECOMMENDED DAILY TRAFFIC VOLUME LOS THRESHOLDS (VEHICLES PER DAY)		
		LOS C	LOS D ⁽²⁾	LOS E
Collector	1	> 9,500 to 10,500	> 10,500 to 12,000	> 12,000 to 13,500
Minor Arterial	2	> 22,500 to 25,500	> 25,500 to 28,500	> 28,500 to 32,000
Minor Arterial ⁽¹⁾	3	>30,000 to 34,500	>34,500 to 38,500	>38,500 to 43,000
Major Arterial	2	> 30,000 to 36,000	> 36,000 to 40,000	> 40,000 to 45,000
Major Arterial	3	> 46,000 to 53,000	> 53,000 to 60,000	> 60,000 to 67,000
Major Arterial ⁽¹⁾	4	> 56,000 to 64,000	> 64,000 to 72,000	> 72,000 to 80,000
Expressway	2	> 38,000 to 44,000	> 44,000 to 49,000	> 49,000 to 55,000
Expressway	3	> 56,000 to 64,000	> 64,000 to 72,000	> 72,000 to 80,000

⁽¹⁾ System performance evaluation only.

⁽²⁾ LOS D threshold volumes used for development roadway planning consistent with traffic impact study guidelines.

Source: NEATS Refresh, October 2018

Alternatives Evaluation

A summary of the roadway needs of the alternative alignments is provided in **Table 2**.

ROADWAY SEGMENT	ROADWAY CLASSIFICATION AND LANES		
	NEATS BASE ALIGNMENT	NEATS OPTIONAL ALIGNMENT	POWHATON TO JACKSON GAP WAY ALIGNMENT
Harvest - 48 th to 56 th	6-lane arterial	4-lane arterial	4-lane arterial
Harvest - 56 th to 68 th	6-lane arterial	6-lane arterial	4-lane arterial
Jackson Gap Way - 56 th to 68 th	4-lane collector	4-lane collector	4-lane arterial*
Jackson Gap St. - 68 th to Pena	6-lane arterial	6-lane arterial	6-lane arterial
Powhatan – 48 th to 56 th	4-lane arterial	4-lane arterial	6-lane arterial**
Powhatan – 56 th to 68 th	4-lane arterial	4-lane arterial	4-lane arterial
48 th – Harvest to Powhatan	6-lane arterial	4-lane arterial	4-lane arterial
Diagonal Connection – Harvest to Powhatan	N/A	6-lane arterial	N/A
Diagonal Connection – Powhatan to Jackson Gap Way	N/A	N/A	4-lane arterial

* Access control and other measures to enhance capacity of collector to arterial

** 4-lane arterial from diagonal connection to 56th Avenue

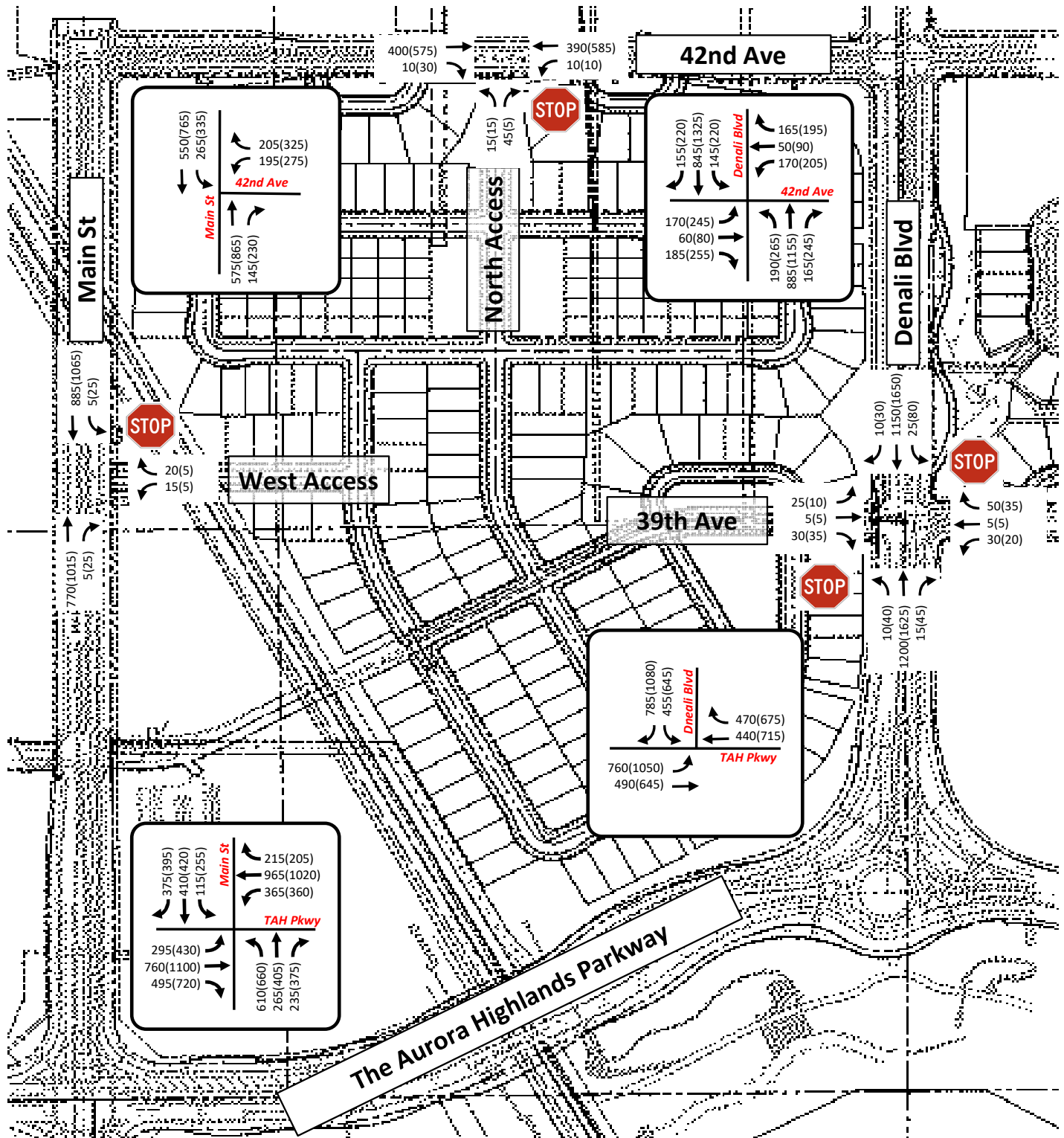


Figure 9
2040 Traffic Volumes

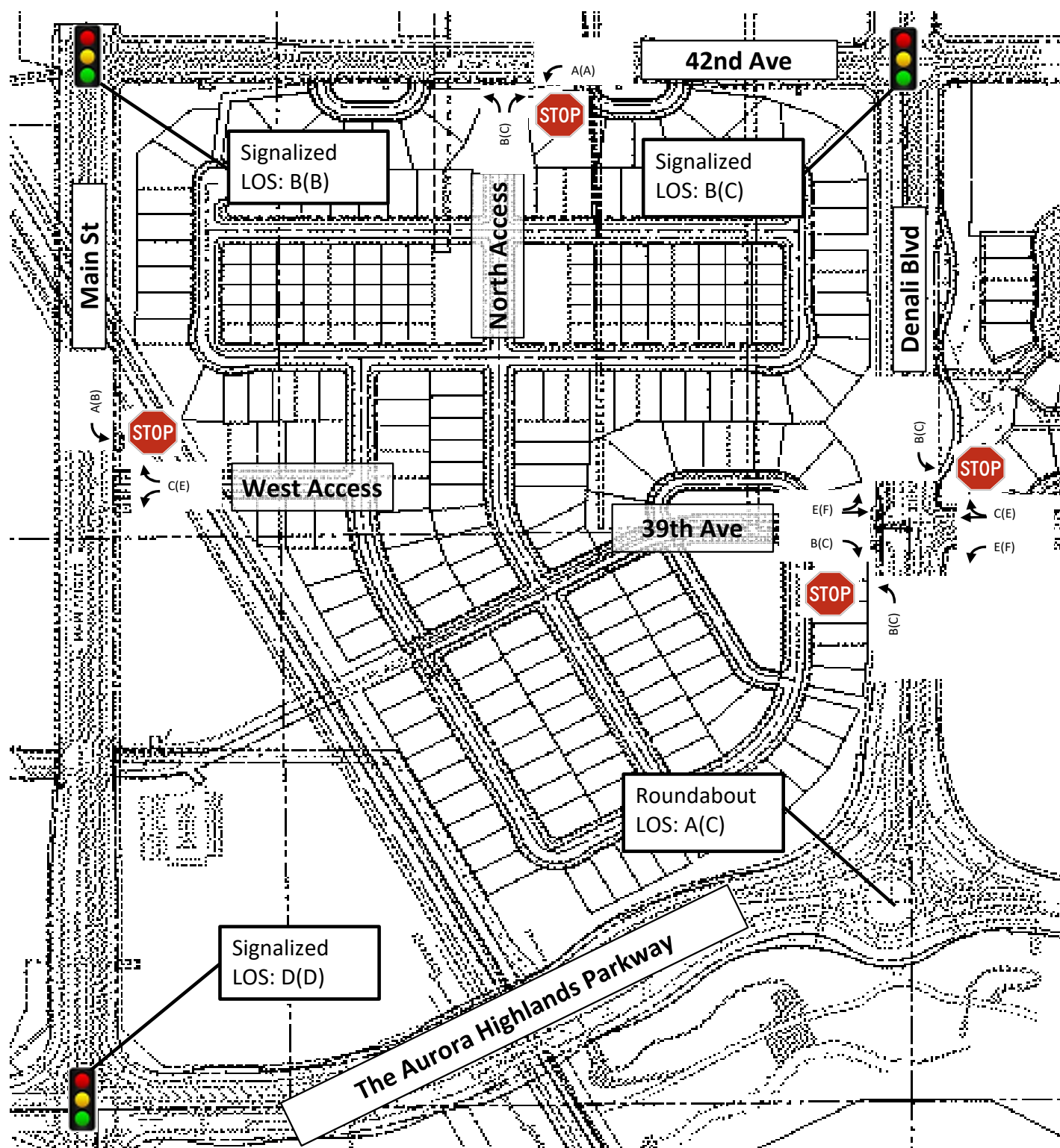




Figure 10
2040 Total Traffic Volumes

1. HRG Horizon Total Turning movements counts (Figure 9 and Figure 10 Filings 4&5 and CSP1 , also Winder TIS Figure 18) used to obtain Turning Movements percentages at each intersections
2. FHU Figure 5 Background traffic at each leg (i.e. ADT/2) * percentages obtained in step 1 = Background Turning Movements
3. New Adjustment were made to FHU background traffic based on the new proposed extension on Pawhaton Road

HRG= HR Green TIS Filings 1&2&4&5&8

FHU= The Aurora Highlands MTIS

Winder = Winder Master Plan , MTIS

48th Avenue										42nd Avenue										48th Avenue																													
AM										PM										AM										PM										Adjusted for the new study (Amendment to the NEATS)									
Intersection 12										Intersection 12										Intersection Main										Intersection Main										Main									
Main										Main										Main										Main										Main									
EB										EB										EB										EB										EB									
		LT	188	0.092157	106	EB	LT	465	0.17235	198	EB	LT			EB	LT				EB	LT			EB	LT			EB	LT			EB	LT																
		TH	1452	0.711765	819	TH	TH	1793	0.664566	764	TH	TH			TH	TH				TH	TH			TH	TH			TH	TH			TH	TH																
		RT	400	0.196078	225	RT	RT	440	0.163084	188	RT	RT			RT	RT				RT	RT			RT	RT			RT	RT			RT	RT																
		SUM	2040			SUM	SUM	2698			SUM	SUM			SUM	SUM				SUM	SUM			SUM	SUM			SUM	SUM			SUM	SUM																
		FHU BG	1150			FHU BG	FHU BG				FHU BG	FHU BG			FHU BG	FHU BG				FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG																
Previous study TMC	NB	LT	390	0.590015	118	NB	LT	350	0.44757	90	NB	LT	0	0	0	NB	LT	0	0		NB	LT	0	0		NB	LT	0	0		NB	LT	0	0															
		TH	21	0.03177	6	TH	TH	32	0.040921	8	TH	TH	575	0.798611	200	TH	TH	865	0.789954	197		TH	TH	865	0.789954	197	TH	TH	865	0.789954	197	TH	TH	865	0.789954														
		RT	250	0.378215	76	RT	RT	400	0.511509	102	RT	RT	145	0.201389	50	RT	RT	230	0.210046	53		RT	RT	230	0.210046	53	RT	RT	230	0.210046	53	RT	RT	230	0.210046														
		SUM	661			SUM	SUM	782			SUM	SUM	720			SUM	SUM	1095				SUM	SUM	1095			SUM	SUM			SUM	SUM																	
		FHU BG	200			FHU BG	FHU BG				FHU BG	FHU BG	250			FHU BG	FHU BG					FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG														
	WB	LT	420	0.060356	75	WB	LT	230	0.108747	136	WB	LT	195	0.4875	24	WB	LT	275	0.458333	23		WB	LT	275	0.458333	23	WB	LT	275	0.458333	23	WB	LT	275	0.458333														
		TH	1744	0.757273	947	TH	TH	1519	0.718203	898	TH	TH	0	0	0	TH	TH	0	0	0		TH	TH	0	0	0	TH	TH	0	0	0	TH	TH	0	0														
		RT	139	0.182371	228	RT	RT	366	0.17305	216	RT	RT	205	0.5125	26	RT	RT	325	0.541667	27		RT	RT	325	0.541667	27	RT	RT	325	0.541667	27	RT	RT	325	0.541667														
		SUM	2303			SUM	SUM	2115			SUM	SUM	400			SUM	SUM	600				SUM	SUM	600			SUM	SUM			SUM	SUM																	
		FHU BG	1250			FHU BG	FHU BG				FHU BG	FHU BG	50			FHU BG	FHU BG					FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG														
	SB	LT	260	1.452514	260	SB	LT	409	0.69322	124	SB	LT	265	0.325153	65	SB	LT	355	0.316964	63		SB	LT	355	0.316964	63	SB	LT	355	0.316964	63	SB	LT	355	0.316964														
		TH	29	0.162011	29	TH	TH	26	0.044068	8	TH	TH	550	0.674847	135	TH	TH	765	0.683036	137		TH	TH	765	0.683036	137	TH	TH	765	0.683036	137	TH	TH	765	0.683036														
		RT	79	0.441341	79	RT	RT	155	0.262712	47	RT	RT	0	0	0	RT	RT	0	0	0		RT	RT	0	0	0	RT	RT	0	0	0	RT	RT	0	0														
		SUM	179			SUM	SUM	590			SUM	SUM	815			SUM	SUM	1120				SUM	SUM	1120			SUM	SUM			SUM	SUM																	
		FHU BG				FHU BG	FHU BG				FHU BG	FHU BG	200			FHU BG	FHU BG					FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG														
	Denali	Intersection 11					Intersection Denali					Intersection Denali					Intersection Denali					Denali					Denali																						
		EB	LT	157	0.07998	100	EB	LT	220	0.084681	106	EB	LT	170	0.409639	20	EB	LT	245	0.422414	21		EB	LT	245	0.422414	21	EB	LT	245	0.422414	21	EB	LT	245	0.422414													
		TH	1190	0.606215	758	TH	TH	1532	0.589684	737	TH	TH	60	0.144578	7	TH	TH	80	0.137931	7		TH	TH	80	0.137931	7	TH	TH	80	0.137931	7	TH	TH	80	0.137931														
		RT	616	0.313805	392	RT	RT	846	0.325635	407	RT	RT	185	0.445783	22	RT	RT	255	0.439655	22		RT	RT	255	0.439655	22	RT	RT	255	0.439655	22	RT	RT	255	0.439655														
		SUM	1963			SUM	SUM	2598			SUM	SUM	415			SUM	SUM	580				SUM	SUM	580			SUM	SUM			SUM	SUM																	
FHU BG		1250			FHU BG	FHU BG				FHU BG	FHU BG	50			FHU BG	FHU BG					FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG															
NB		LT	646	0.478519	239	NB	LT	658	0.468661	234	NB	LT	190	0.153226	77	NB	LT	265	0.159159	80		NB	LT	265	0.159159	80	NB	LT	265	0.159159	80	NB	LT	265	0.159159														
		TH	243	0.18	90	TH	TH	284	0.202279	101	TH	TH	885	0.71371	357	TH	TH	1155	0.693694	347		TH	TH	1155	0.693694	347	TH	TH	1155	0.693694	347	TH	TH	1155	0.693694														
		RT	461	0.341481	171	RT	RT	462	0.32906	165	RT	RT	165	0.133065	67	RT	RT	245	0.147147	74		RT	RT	245	0.147147	74	RT	RT	245	0.147147	74	RT	RT	245	0.147147														
		SUM	1350			SUM	SUM	1404			SUM	SUM	1240			SUM	SUM	1665				SUM	SUM	1665			SUM	SUM			SUM	SUM																	
	FHU BG	500			FHU BG	FHU BG				FHU BG	FHU BG	500			FHU BG	FHU BG					FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG															
WB	LT	340	0.176075	220	WB	LT	500	0.27115	339	WB	LT	170	0.441558	22	WB	LT	205	0.418367	21		WB	LT	205	0.418367	21	WB	LT	205	0.418367	21	WB	LT	205	0.418367															
	TH	1463	0.757639	947	TH	TH	1195	0.648048	810	TH	TH	50	0.12987	6	TH	TH	90	0.183673	9		TH	TH	90	0.183673	9	TH	TH	90	0.183673	9	TH	TH	90	0.183673															
	RT	128	0.066287	83	RT	RT	149	0.080803	101	RT	RT	165	0.428571	21	RT	RT	195	0.397959	20		RT	RT	195	0.397959	20	RT	RT	195	0.397959	20	RT	RT	195	0.397959															
	SUM	1931			SUM	SUM	1844			SUM	SUM	385			SUM	SUM	490				SUM	SUM	490			SUM	SUM			SUM	SUM																		
	FHU BG	1250			FHU BG	FHU BG				FHU BG	FHU BG	50			FHU BG	FHU BG					FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG															
SB	LT	123	0.229907	161	SB	LT	223	0.216715	152	SB	LT	145	0.126638	63	SB	LT	220	0.124646	62		SB	LT	220	0.124646	62	SB	LT	220	0.124646	62	SB	LT	220	0.124646															
	TH	217	0.405607	284	TH	TH	279	0.271137	190	TH	TH	845	0.737991	369	TH	TH	1325	0.750708	375		TH	TH	1325	0.750708	375	TH	TH	1325	0.750708	375	TH	TH	1325	0.750708															
	RT	195	0.364486	255	RT	RT	527	0.512148	359	RT	RT	155	0.135371	68	RT	RT	220	0.124646	62		RT	RT	220	0.124646	62	RT	RT	220	0.124646	62	RT	RT	220	0.124646															
	SUM	535			SUM	SUM	1029			SUM	SUM	1145			SUM	SUM	1765				SUM	SUM	1765			SUM	SUM			SUM	SUM																		
	FHU BG	700			FHU BG	FHU BG				FHU BG	FHU BG	500			FHU BG	FHU BG					FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG															
Harvest	Intersection 9					Intersection 17(Vistro)/Fultondale/NW Acc					Intersection 17(Vistro)/Fultondale/NW Acc					Intersection 17(Vistro)/Fultondale/NW Acc					Harvest					Harvest																							
	EB	LT	850	44%	553	EB	LT	800	0.406918	509	EB	LT	79	0.221289	11	EB	LT	35	0.648148	32		EB	LT	35	0.648148	32	EB	LT	35	0.648148	32	EB	LT	35	0.648148														
	TH	1073	56%	697	TH	TH	1166	0.593082	741	TH	TH	257	0.719888	36	TH	TH	7	0.12963	6		TH	TH	7	0.12963	6	TH	TH	7	0.12963	6	TH	TH	7	0.12963															
	RT	0	0%	0	RT	RT	0	0	0	RT	RT	21	0.058824	3	RT	RT	12	0.222222	11		RT	RT	12	0.222222	11	RT	RT	12	0.222222	11	RT	RT	12	0.222222															
	SUM	1923			SUM	SUM	1966			SUM	SUM	357			SUM	SUM	54				SUM	SUM	54			SUM	SUM			SUM	SUM																		
	FHU BG	1250			FHU BG	FHU BG				FHU BG	FHU BG	50			FHU BG	FHU BG					FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG			FHU BG	FHU BG															
	NB					NB						NB	LT	39	0.4875	39	NB	LT	35	0.54688	35		NB	LT	35	0.54688	35	NB	LT	35	0.54688	35	NB	LT	35	0.54688													
		TH																																															

Segment	NEATS (ADT)	New Study (ADT)	Factor
48th Ave W.O Harvest	54.5	45.9	0.842202
48th Ave E.O Harvest	51.8	25.2	0.486486
48th E.O Pawhaton	24.47	26.3	1.074785
Harvest N.O 48th Ave	43.3	26.3	0.60739
Pawhaton N.O 48th	22.4	46.9	2.09375
Pawhaton S.O 48th	48	53.1	1.10625

Appendix B – ITE Trip Generation Calculations

PROJECT DETAILS			
Project Name:	TAH Area B	Type of Project:	
Project No:		City:	
Country:		Built-up Area(Sq.ft):	
Analyst Name:	Scott Barnhart	Clients Name:	
Date:	1/22/2022	ZIP/Postal Code:	
State/Province:		No. of Scenarios:	3
Analysis Region:			
SCENARIO SUMMARY			

Scenarios	Name	No. of Land Uses	Phases of Development	No. of Years to Project Traffic	User Group	Estimated New Vehicle Trips		
						Entry	Exit	Total
Scenario - 1	Weekday	6	1	0		2948	2948	5896
Scenario - 2	AM Peak Hour	6	1	0		113	322	435
Scenario - 3	PM Peak Hour	6	1	0		367	214	581

Scenario - 1

Scenario Name: Weekday

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method	Entry	Exit	Total
					Rate/Equation	Split%	Split%	
210 - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	162	Weekday	Best Fit (LOG)	786	786	1572
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.92Ln(X) + 2.68	50%	50%	
210(1) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	50	Weekday	Best Fit (LOG)	267	267	534
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.92Ln(X) + 2.68	50%	50%	
210(2) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	118	Weekday	Best Fit (LOG)	588	588	1176
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.92Ln(X) + 2.68	50%	50%	
210(3) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	79	Weekday	Best Fit (LOG)	406	406	812
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.92Ln(X) + 2.68	50%	50%	
210(4) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	105	Weekday	Best Fit (LOG)	528	528	1056
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.92Ln(X) + 2.68	50%	50%	
210(5) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	72	Weekday	Best Fit (LOG)	373	373	746
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.92Ln(X) + 2.68	50%	50%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
210 - Single-Family Detached Housing	100	100	1	1	50	50
210(1) - Single-Family Detached Housing	100	100	1	1	50	50
210(2) - Single-Family Detached Housing	100	100	1	1	50	50
210(3) - Single-Family Detached Housing	100	100	1	1	50	50
210(4) - Single-Family Detached Housing	100	100	1	1	50	50
210(5) - Single-Family Detached Housing	100	100	1	1	50	50

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
210 - Single-Family Detached Housing	786	786	0	0	786	786
	1572		0		1572	
210(1) - Single-Family Detached Housing	267	267	0	0	267	267
	534		0		534	
210(2) - Single-Family Detached Housing	588	588	0	0	588	588
	1176		0		1176	
210(3) - Single-Family Detached Housing	406	406	0	0	406	406
	812		0		812	
210(4) - Single-Family Detached Housing	528	528	0	0	528	528
	1056		0		1056	
210(5) - Single-Family Detached Housing	373	373	0	0	373	373
	746		0		746	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
210 - Single-Family Detached Housing	786	786	1572
210(1) - Single-Family Detached Housing	267	267	534
210(2) - Single-Family Detached Housing	588	588	1176
210(3) - Single-Family Detached Housing	406	406	812
210(4) - Single-Family Detached Housing	528	528	1056
210(5) - Single-Family Detached Housing	373	373	746

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	2948	2948	5896
External Vehicle Trips	2948	2948	5896
New Vehicle Trips	2948	2948	5896

Scenario - 2

Scenario Name: AM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method	Entry	Exit	Total
					Rate/Equation	Split%	Split%	
210 - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	162	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	30	86	116
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.91Ln(X) + 0.12	26%	74%	
210(1) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	50	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	10	29	39
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.91Ln(X) + 0.12	26%	74%	
210(2) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	118	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	23	64	87
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.91Ln(X) + 0.12	26%	74%	
210(3) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	79	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	16	44	60
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.91Ln(X) + 0.12	26%	74%	
210(4) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	105	Weekday, Peak Hour of Adjacent Street	Best Fit (LOG)	20	58	78
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.91Ln(X) + 0.12	26%	74%	
210(5) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	72	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	14	41	55
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.91Ln(X) + 0.12	26%	74%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
210 - Single-Family Detached Housing	100	100	1	1	26	74
210(1) - Single-Family Detached Housing	100	100	1	1	26	74
210(2) - Single-Family Detached Housing	100	100	1	1	26	74
210(3) - Single-Family Detached Housing	100	100	1	1	26	74
210(4) - Single-Family Detached Housing	100	100	1	1	26	74
210(5) - Single-Family Detached Housing	100	100	1	1	26	74

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
210 - Single-Family Detached Housing	30	86	0	0	30	86
	116		0		116	
210(1) - Single-Family Detached Housing	10	29	0	0	10	29
	39		0		39	
210(2) - Single-Family Detached Housing	23	64	0	0	23	64
	87		0		87	
210(3) - Single-Family Detached Housing	16	44	0	0	16	44
	60		0		60	
210(4) - Single-Family Detached Housing	20	58	0	0	20	58
	78		0		78	
210(5) - Single-Family Detached Housing	14	41	0	0	14	41
	55		0		55	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
210 - Single-Family Detached Housing	30	86	116
210(1) - Single-Family Detached Housing	10	29	39
210(2) - Single-Family Detached Housing	23	64	87
210(3) - Single-Family Detached Housing	16	44	60
210(4) - Single-Family Detached Housing	20	58	78
210(5) - Single-Family Detached Housing	14	41	55

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	113	322	435
External Vehicle Trips	113	322	435
New Vehicle Trips	113	322	435

Scenario - 3

Scenario Name: PM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method	Entry	Exit	Total
					Rate/Equation	Split%	Split%	
210 - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	162	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	99	58	157
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.94Ln(X) + 0.27	63%	37%	
210(1) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	50	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	33	19	52
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.94Ln(X) + 0.27	63%	37%	
210(2) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	118	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	73	43	116
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.94Ln(X) + 0.27	63%	37%	
210(3) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	79	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	50	29	79
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.94Ln(X) + 0.27	63%	37%	
210(4) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	105	Weekday, Peak Hour of Adjacent Street	Best Fit (LOG)	66	38	104
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.94Ln(X) + 0.27	63%	37%	
210(5) - Single-Family Detached Housing	General Urban/Suburban	Dwelling Units	72	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	46	27	73
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.94Ln(X) + 0.27	63%	37%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
210 - Single-Family Detached Housing	100	100	1	1	63	37
210(1) - Single-Family Detached Housing	100	100	1	1	63	37
210(2) - Single-Family Detached Housing	100	100	1	1	63	37
210(3) - Single-Family Detached Housing	100	100	1	1	63	37
210(4) - Single-Family Detached Housing	100	100	1	1	63	37
210(5) - Single-Family Detached Housing	100	100	1	1	63	37

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
210 - Single-Family Detached Housing	99	58	0	0	99	58
	157		0		157	
210(1) - Single-Family Detached Housing	33	19	0	0	33	19
	52		0		52	
210(2) - Single-Family Detached Housing	73	43	0	0	73	43
	116		0		116	
210(3) - Single-Family Detached Housing	50	29	0	0	50	29
	79		0		79	
210(4) - Single-Family Detached Housing	66	38	0	0	66	38
	104		0		104	
210(5) - Single-Family Detached Housing	46	27	0	0	46	27
	73		0		73	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
210 - Single-Family Detached Housing	99	58	157
210(1) - Single-Family Detached Housing	33	19	52
210(2) - Single-Family Detached Housing	73	43	116
210(3) - Single-Family Detached Housing	50	29	79
210(4) - Single-Family Detached Housing	66	38	104
210(5) - Single-Family Detached Housing	46	27	73

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	367	214	581
External Vehicle Trips	367	214	581
New Vehicle Trips	367	214	581

Appendix C – Horizon Without Project Analyses



Intersection Level Of Service Report

Intersection 1: 48th Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	39.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.320

Intersection Setup

Name	Main Street			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound		
Lane Configuration	L			L			L L L R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	2	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	325.0	100.0	400.0	250.0	100.0	250.0	300.0	100.0	400.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.0
Speed [mph]	30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00		
Curb Present	No			No			No		
Crosswalk	Yes			Yes			Yes		

**Volumes**

Name	Main Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	99	5	64	218	24	66	89	688	189	63	795	63
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	32	0	0	66	0	0	95	0	0	32
Total Hourly Volume [veh/h]	99	5	32	218	24	0	89	688	94	63	795	31
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	27	1	9	59	7	0	24	187	26	17	216	8
Total Analysis Volume [veh/h]	108	5	35	237	26	0	97	748	102	68	864	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	43	0	14	43	0	13	34	0	9	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	34	0	0	34	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	47	47	10	52	52	5	23	23	4	22	22
g / C, Green / Cycle	0.05	0.47	0.47	0.10	0.52	0.52	0.05	0.23	0.23	0.04	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.03	0.00	0.02	0.08	0.02	0.00	0.03	0.16	0.07	0.02	0.19	0.02
s, saturation flow rate [veh/h]	3113	1683	1431	3113	1683	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	166	796	676	298	867	737	152	1046	326	135	1022	319
d1, Uniform Delay [s]	46.49	13.96	14.27	44.31	11.95	0.00	46.75	35.64	32.12	46.83	37.26	30.98
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering 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
d2, Incremental Delay [s]	4.27	0.01	0.15	4.81	0.06	0.00	4.38	0.93	0.54	2.86	2.03	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.65	0.01	0.05	0.79	0.03	0.00	0.64	0.71	0.31	0.50	0.85	0.11
d, Delay for Lane Group [s/veh]	50.77	13.98	14.42	49.12	12.01	0.00	51.13	36.57	32.66	49.69	39.29	31.12
Lane Group LOS	D	B	B	D	B	A	D	D	C	D	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.41	0.06	0.45	3.05	0.29	0.00	1.27	5.62	2.09	0.88	6.83	0.66
50th-Percentile Queue Length [ft/ln]	35.25	1.55	11.22	76.36	7.36	0.00	31.81	140.5	52.20	21.95	170.8	16.62
95th-Percentile Queue Length [veh/ln]	2.54	0.11	0.81	5.50	0.53	0.00	2.29	9.51	3.76	1.58	11.12	1.20
95th-Percentile Queue Length [ft/ln]	63.45	2.79	20.20	137.4	13.25	0.00	57.26	237.7	93.97	39.52	278.0	29.91

**Movement, Approach, & Intersection Results**

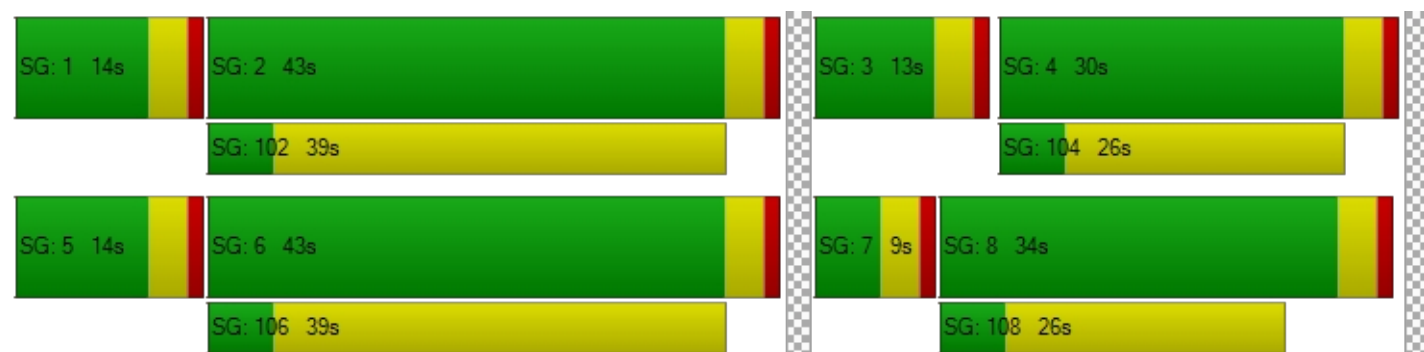
d_M, Delay for Movement [s/veh]	50.77	13.98	14.42	49.12	12.01	0.00	51.13	36.57	32.66	49.69	39.29	31.12
Movement LOS	D	B	B	D	B	A	D	D	C	D	D	C
d_A, Approach Delay [s/veh]	40.93			45.45			37.64			39.74		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.60											
Intersection LOS	D											
Intersection V/C	0.320											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	2.582			2.634			3.311			3.123		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	779			779			600			520		
d_b, Bicycle Delay [s]	18.63			18.63			24.53			27.41		
I_b,int, Bicycle LOS Score for Intersection	1.857			2.102			2.133			2.109		
Bicycle LOS	A			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 5: 48th Avenue/Denali Boulevard

Control Type:	Signalized	Delay (sec / veh):	26.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.369

Intersection Setup

Name	Denali Boulevard			Denali Boulevard			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	3	0	1	1	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	350.0	100.0	250.0	350.0	100.0	300.0	250.0	100.0	450.0	400.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	0.00	0.00	300.0
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Denali Boulevard			Denali Boulevard			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	201	76	143	135	238	214	84	637	329	185	796	70
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	143	0	0	107	0	0	165	0	0	35
Total Hourly Volume [veh/h]	201	76	0	135	238	107	84	637	164	185	796	35
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	55	21	0	37	65	29	23	173	45	50	216	10
Total Analysis Volume [veh/h]	218	83	0	147	259	116	91	692	178	201	865	38
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	48	0	9	43	0	23	36	0	17	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	37	0	0	34	0	0	27	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	16	16	26	12	12	5	63	63	9	68	68
g / C, Green / Cycle	0.09	0.15	0.15	0.23	0.11	0.11	0.05	0.58	0.58	0.08	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.00	0.11	0.08	0.08	0.03	0.15	0.12	0.06	0.19	0.03
s, saturation flow rate [veh/h]	3113	3204	1431	1300	3204	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	273	480	214	372	347	155	144	2635	822	261	2808	876
d1, Uniform Delay [s]	49.26	40.86	0.00	36.12	47.63	47.64	51.59	11.72	11.36	49.40	10.19	8.49
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	5.30	0.17	0.00	0.68	3.22	7.06	4.53	0.24	0.60	4.79	0.29	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.80	0.17	0.00	0.40	0.75	0.75	0.63	0.26	0.22	0.77	0.31	0.04
d, Delay for Lane Group [s/veh]	54.56	41.03	0.00	36.80	50.85	54.70	56.12	11.96	11.97	54.19	10.48	8.59
Lane Group LOS	D	D	A	D	D	D	E	B	B	D	B	A
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.13	1.00	0.00	3.40	3.59	3.38	1.32	2.80	2.19	2.87	3.25	0.37
50th-Percentile Queue Length [ft/ln]	78.32	24.90	0.00	85.12	89.77	84.55	33.06	69.97	54.69	71.85	81.21	9.28
95th-Percentile Queue Length [veh/ln]	5.64	1.79	0.00	6.13	6.46	6.09	2.38	5.04	3.94	5.17	5.85	0.67
95th-Percentile Queue Length [ft/ln]	140.9	44.82	0.00	153.2	161.5	152.2	59.52	125.9	98.45	129.3	146.1	16.71

**Movement, Approach, & Intersection Results**

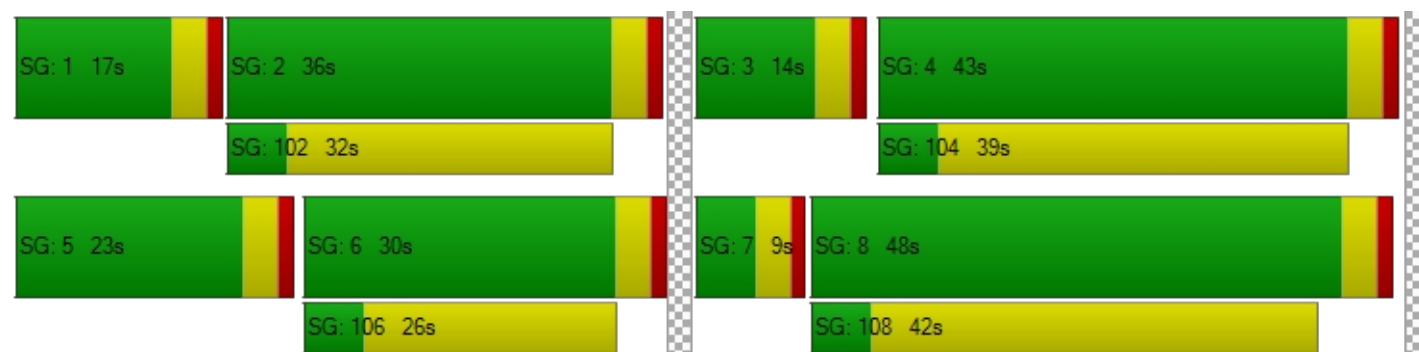
d_M, Delay for Movement [s/veh]	54.56	41.03	0.00	36.80	50.85	54.70	56.12	11.96	11.97	54.19	10.48	8.59
Movement LOS	D	D	A	D	D	D	E	B	B	D	B	A
d_A, Approach Delay [s/veh]	50.83			47.75			16.15			18.37		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	26.32											
Intersection LOS	C											
Intersection V/C	0.369											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	46.39			46.39			46.39			46.39		
I_p,int, Pedestrian LOS Score for Intersection	2.982			2.759			3.359			3.269		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			709			582			473		
d_b, Bicycle Delay [s]	19.82			22.94			27.68			32.10		
I_b,int, Bicycle LOS Score for Intersection	1.926			2.079			2.179			2.186		
Bicycle LOS	A			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 12: 48th Avenue/Fultondale Street

Control Type:	Signalized	Delay (sec / veh):	10.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.229

Intersection Setup

Name	Fultondale Street						48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T			T T T T			T T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	2	0	1	1	0	0	1	0	1	2	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	150.0	100.0	100.0	40.00	100.0	100.0	175.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Fultondale Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	73	4	49	0	24	24	9	716	43	28	350	2
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	25	0	0	12	0	0	22	0	0	1
Total Hourly Volume [veh/h]	73	4	24	0	24	12	9	716	21	28	350	1
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	20	1	7	0	7	3	2	195	6	8	95	0
Total Analysis Volume [veh/h]	79	4	26	0	26	13	10	778	23	30	380	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	ProtP	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	39	0	9	39	0	9	32	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	21	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	11	11	15	6	67	61	61	3	62	62
g / C, Green / Cycle	0.05	0.12	0.12	0.16	0.07	0.75	0.67	0.67	0.03	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.03	0.00	0.02	0.00	0.02	0.01	0.17	0.02	0.01	0.08	0.08
s, saturation flow rate [veh/h]	3113	1683	1431	1293	1589	935	4584	1431	3113	3204	1681
c, Capacity [veh/h]	153	199	169	327	112	783	3081	962	96	2208	1158
d1, Uniform Delay [s]	41.84	35.13	35.69	0.00	39.92	2.95	5.84	4.93	42.78	4.72	4.72
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.70	0.04	0.42	0.00	1.83	0.03	0.20	0.05	1.85	0.10	0.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.02	0.15	0.00	0.35	0.01	0.25	0.02	0.31	0.11	0.11
d, Delay for Lane Group [s/veh]	44.53	35.17	36.11	0.00	41.76	2.98	6.03	4.97	44.63	4.83	4.92
Lane Group LOS	D	D	D	A	D	A	A	A	D	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.91	0.08	0.53	0.00	0.87	0.04	1.70	0.14	0.35	0.69	0.75
50th-Percentile Queue Length [ft/ln]	22.63	1.98	13.20	0.00	21.81	1.02	42.60	3.39	8.71	17.22	18.84
95th-Percentile Queue Length [veh/ln]	1.63	0.14	0.95	0.00	1.57	0.07	3.07	0.24	0.63	1.24	1.36
95th-Percentile Queue Length [ft/ln]	40.74	3.56	23.75	0.00	39.26	1.84	76.68	6.10	15.68	31.00	33.91

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	44.53	35.17	36.11	0.00	41.76	41.76	2.98	6.03	4.97	44.63	4.86	4.92
Movement LOS	D	D	D	A	D	D	A	A	A	D	A	A
d_A, Approach Delay [s/veh]	42.18			41.76			5.97			7.76		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.41											
Intersection LOS	B											
Intersection V/C	0.229											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.49			36.49			36.49			36.49		
I_p,int, Pedestrian LOS Score for Intersection	2.528			1.991			2.919			2.880		
Crosswalk LOS	B			A			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	777			777			622			644		
d_b, Bicycle Delay [s]	16.84			16.84			21.40			20.71		
I_b,int, Bicycle LOS Score for Intersection	1.781			1.644			2.018			1.786		
Bicycle LOS	A			A			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 16: 42nd Avenue/Denali Boulevard

Control Type:	Signalized	Delay (sec / veh):	8.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.144

Intersection Setup

Name	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	77	357	67	63	369	68	20	7	22	22	6	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	34	0	0	34	0	0	11	0	0	11
Total Hourly Volume [veh/h]	77	357	33	63	369	34	20	7	11	22	6	10
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	21	97	9	17	100	9	5	2	3	6	2	3
Total Analysis Volume [veh/h]	84	388	36	68	401	37	22	8	12	24	7	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	109	0	0	109	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	105	105	105	105	105	105	27	27	27	27	27	27
g / C, Green / Cycle	0.75	0.75	0.75	0.75	0.75	0.75	0.19	0.19	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.10	0.12	0.03	0.08	0.13	0.03	0.02	0.00	0.01	0.02	0.00	0.01
s, saturation flow rate [veh/h]	856	3204	1431	867	3204	1431	1255	1683	1431	1253	1683	1431
c, Capacity [veh/h]	650	2403	1073	659	2403	1073	271	325	276	270	325	276
d1, Uniform Delay [s]	6.99	4.98	4.49	6.78	5.00	4.49	48.47	45.82	45.99	48.61	45.79	45.96
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering 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
d2, Incremental Delay [s]	0.41	0.14	0.06	0.31	0.15	0.06	0.58	0.14	0.30	0.65	0.12	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.13	0.16	0.03	0.10	0.17	0.03	0.08	0.02	0.04	0.09	0.02	0.04
d, Delay for Lane Group [s/veh]	7.40	5.12	4.55	7.09	5.15	4.55	49.06	45.96	46.29	49.26	45.92	46.23
Lane Group LOS	A	A	A	A	A	A	D	D	D	D	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.89	1.56	0.27	0.70	1.62	0.28	0.70	0.24	0.37	0.76	0.21	0.34
50th-Percentile Queue Length [ft/ln]	22.31	38.94	6.75	17.55	40.43	6.94	17.44	6.04	9.19	19.08	5.28	8.42
95th-Percentile Queue Length [veh/ln]	1.61	2.80	0.49	1.26	2.91	0.50	1.26	0.44	0.66	1.37	0.38	0.61
95th-Percentile Queue Length [ft/ln]	40.15	70.09	12.14	31.58	72.77	12.49	31.40	10.88	16.55	34.35	9.51	15.15

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	7.40	5.12	4.55	7.09	5.15	4.55	49.06	45.96	46.29	49.26	45.92	46.23
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	5.46			5.37			47.67			47.91		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	8.65											
Intersection LOS	A											
Intersection V/C	0.144											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	61.29			61.29			61.29			61.29		
I_p,int, Pedestrian LOS Score for Intersection	2.719			2.713			2.499			2.314		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1500			1500			386			386		
d_b, Bicycle Delay [s]	4.38			4.38			45.60			45.60		
I_b,int, Bicycle LOS Score for Intersection	2.007			2.005			1.647			1.647		
Bicycle LOS	B			B			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 17: 42nd Avenue/Fultondale Street

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.028

Intersection Setup

Name	Fultondale Street			Fultondale Street			42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Fultondale Street			Fultondale Street			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	0	0	69	18	63	11	36	3	3	72	25
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	69	18	63	11	36	3	3	72	25
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	19	5	17	3	10	1	1	20	7
Total Analysis Volume [veh/h]	0	0	0	75	20	68	12	39	3	3	78	27
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.09	0.03	0.07	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.35	10.06	8.49	10.00	10.13	9.01	7.44	0.00	0.00	7.30	0.00	0.00
Movement LOS	B	B	A	A	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.31	0.09	0.23	0.02	0.00	0.00	0.01	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	7.78	2.14	5.67	0.61	0.00	0.00	0.14	0.00	0.00
d_A, Approach Delay [s/veh]	9.64			9.60			1.65			0.20		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.16											
Intersection LOS	B											



Intersection Level Of Service Report
Intersection 20: 42nd Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	9.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.078

Intersection Setup

Name	Main Street		Main Street		42nd Avenue	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Main Street		Main Street		42nd Avenue	
Base Volume Input [veh/h]	200	5	65	135	24	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	3	0	0	0	13
Total Hourly Volume [veh/h]	200	2	65	135	24	13
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	1	18	37	7	4
Total Analysis Volume [veh/h]	217	2	71	147	26	14
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	6	0	0	2	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	33	0	0	33	27	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	R
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	29	23	23
g / C, Green / Cycle	0.48	0.48	0.48	0.48	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.07	0.07	0.05	0.01	0.01
s, saturation flow rate [veh/h]	1683	1678	1046	3204	3113	1431
c, Capacity [veh/h]	813	811	553	1549	1193	548
d1, Uniform Delay [s]	8.57	8.57	11.06	8.39	11.50	11.52
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.34	0.35	0.48	0.12	0.03	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.13	0.14	0.13	0.09	0.02	0.03
d, Delay for Lane Group [s/veh]	8.91	8.91	11.53	8.52	11.54	11.61
Lane Group LOS	A	A	B	A	B	B
Critical Lane Group	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.75	0.75	0.60	0.47	0.10	0.12
50th-Percentile Queue Length [ft/ln]	18.71	18.72	14.95	11.68	2.56	2.94
95th-Percentile Queue Length [veh/ln]	1.35	1.35	1.08	0.84	0.18	0.21
95th-Percentile Queue Length [ft/ln]	33.68	33.70	26.91	21.03	4.61	5.29

**Movement, Approach, & Intersection Results**

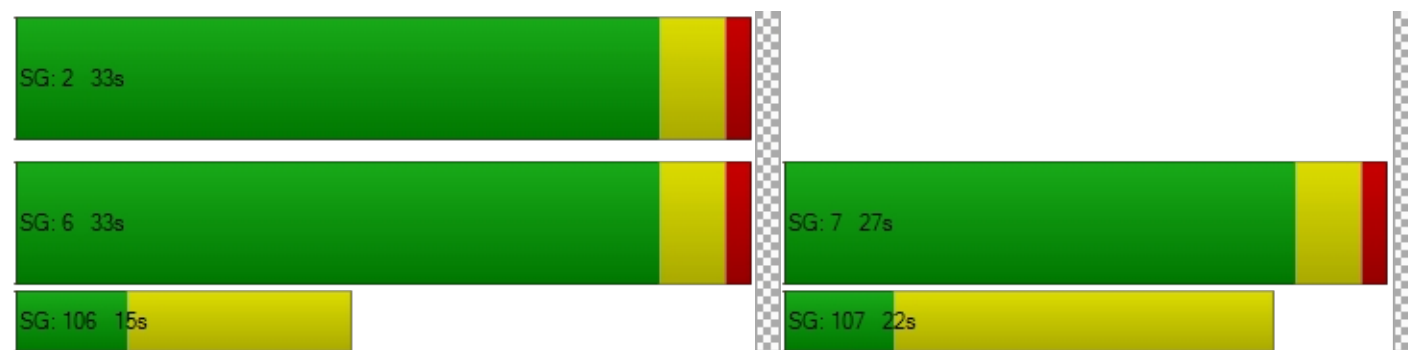
d_M, Delay for Movement [s/veh]	8.91	8.91	11.53	8.52	11.54	11.61
Movement LOS	A	A	B	A	B	B
d_A, Approach Delay [s/veh]	8.91		9.50		11.56	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	9.40					
Intersection LOS	A					
Intersection V/C	0.078					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.68	21.68	21.68
I_p,int, Pedestrian LOS Score for Intersection	2.212	2.371	2.263
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	767
d_b, Bicycle Delay [s]	8.01	8.01	11.41
I_b,int, Bicycle LOS Score for Intersection	1.743	1.739	1.560
Bicycle LOS	A	A	A

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report
Intersection 46: 48th Avenue/Harvest Road

Control Type:	Signalized	Delay (sec / veh):	29.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.390

Intersection Setup

Name	Harvest Road		48th Avenue		48th Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐		⇐	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	3	0	0	1
Entry Pocket Length [ft]	450.00	200.00	400.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	2	0	1	0	1
Exit Pocket Length [ft]	0.00	174.61	0.00	400.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Harvest Road		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	493	287	464	586	166	242
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	287	0	0	0	242
Total Hourly Volume [veh/h]	493	0	464	586	166	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	134	0	126	159	45	0
Total Analysis Volume [veh/h]	536	0	504	637	180	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	7	0	5	2	6	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	5	0	5	10	10	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	46	0	28	64	36	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	37	0	0	10	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	20	80	56	56
g / C, Green / Cycle	0.20	0.20	0.18	0.73	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.17	0.00	0.16	0.20	0.06	0.00
s, saturation flow rate [veh/h]	3113	1431	3113	3204	3204	1431
c, Capacity [veh/h]	619	285	569	2334	1632	729
d1, Uniform Delay [s]	42.62	0.00	43.83	5.07	14.03	0.00
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.80	0.00	4.87	0.29	0.14	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.00	0.89	0.27	0.11	0.00
d, Delay for Lane Group [s/veh]	46.43	0.00	48.70	5.35	14.17	0.00
Lane Group LOS	D	A	D	A	B	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.32	0.00	7.03	2.25	1.19	0.00
50th-Percentile Queue Length [ft/ln]	182.90	0.00	175.64	56.19	29.64	0.00
95th-Percentile Queue Length [veh/ln]	11.75	0.00	11.37	4.05	2.13	0.00
95th-Percentile Queue Length [ft/ln]	293.80	0.00	284.31	101.14	53.36	0.00

**Movement, Approach, & Intersection Results**

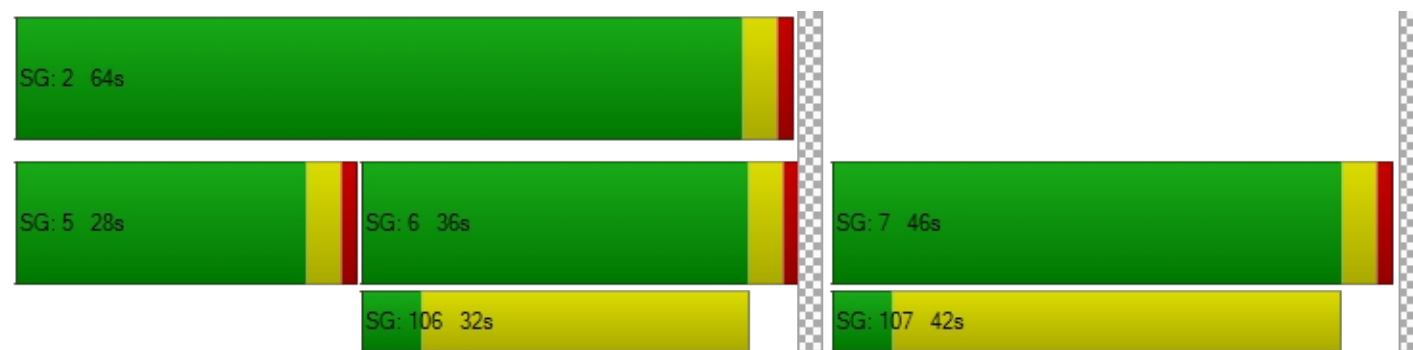
d_M, Delay for Movement [s/veh]	46.43	0.00	48.70	5.35	14.17	0.00
Movement LOS	D	A	D	A	B	A
d_A, Approach Delay [s/veh]	46.43		24.50		14.17	
Approach LOS	D		C		B	
d_I, Intersection Delay [s/veh]	29.83					
Intersection LOS	C					
Intersection V/C	0.390					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.36	46.36	46.36
I_p,int, Pedestrian LOS Score for Intersection	3.232	2.933	3.067
Crosswalk LOS	C	C	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	764	1091	582
d_b, Bicycle Delay [s]	21.01	11.36	27.65
I_b,int, Bicycle LOS Score for Intersection	1.560	2.501	1.908
Bicycle LOS	A	B	A

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 47: 48th Avenue/Powhatan Road

Control Type:	Signalized	Delay (sec / veh):	22.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.474

Intersection Setup

Name	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	3	0	0	2	0	1	2	0	0	2	0	1
Entry Pocket Length [ft]	200.0	100.0	100.0	200.0	100.0	200.0	200.0	100.0	100.0	200.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Powhaton Road			Powhaton Road			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	200	1100	100	10	700	90	200	200	45	60	80	40
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	50	0	0	45	0	0	45	0	0	20
Total Hourly Volume [veh/h]	200	1100	50	10	700	45	200	200	0	60	80	20
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	54	299	14	3	190	12	54	54	0	16	22	5
Total Analysis Volume [veh/h]	217	1196	54	11	761	49	217	217	0	65	87	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	9	39	0	13	40	0	9	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	27	0	0	30	0	0	31	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	64	64	1	58	58	9	14	14	4	10	10
g / C, Green / Cycle	0.08	0.64	0.64	0.01	0.58	0.58	0.09	0.14	0.14	0.04	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.07	0.37	0.04	0.00	0.24	0.03	0.07	0.07	0.00	0.02	0.03	0.02
s, saturation flow rate [veh/h]	3113	3204	1431	3113	3204	1431	3113	3204	1431	3113	3204	1431
c, Capacity [veh/h]	251	2053	917	45	1841	822	277	456	203	133	307	137
d1, Uniform Delay [s]	45.48	10.31	6.72	48.81	11.90	9.39	44.66	39.52	0.00	46.85	42.06	41.56
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	8.58	1.22	0.12	2.81	0.69	0.14	4.80	0.77	0.00	2.74	0.50	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.86	0.58	0.06	0.25	0.41	0.06	0.78	0.48	0.00	0.49	0.28	0.16
d, Delay for Lane Group [s/veh]	54.06	11.53	6.84	51.62	12.58	9.53	49.45	40.29	0.00	49.58	42.56	42.10
Lane Group LOS	D	B	A	D	B	A	D	D	A	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.94	7.09	0.43	0.15	4.63	0.48	2.80	2.49	0.00	0.84	1.02	0.52
50th-Percentile Queue Length [ft/ln]	73.62	177.1	10.69	3.82	115.6	12.10	70.07	62.23	0.00	20.96	25.41	12.95
95th-Percentile Queue Length [veh/ln]	5.30	11.45	0.77	0.28	8.15	0.87	5.05	4.48	0.00	1.51	1.83	0.93
95th-Percentile Queue Length [ft/ln]	132.5	286.3	19.25	6.88	203.8	21.78	126.1	112.0	0.00	37.74	45.74	23.30

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	54.06	11.53	6.84	51.62	12.58	9.53	49.45	40.29	0.00	49.58	42.56	42.10
Movement LOS	D	B	A	D	B	A	D	D	A	D	D	D
d_A, Approach Delay [s/veh]	17.64			12.92			44.87			45.13		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	22.04											
Intersection LOS	C											
Intersection V/C	0.474											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	3.087			3.079			3.024			2.702		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	759			700			719			640		
d_b, Bicycle Delay [s]	19.25			21.16			20.51			23.15		
I_b,int, Bicycle LOS Score for Intersection	2.811			2.274			1.955			1.720		
Bicycle LOS	C			B			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 48: 38th Parkway/Powhaton Road

Control Type:	Signalized	Delay (sec / veh):	19.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.421

Intersection Setup

Name	Powhaton Road			Powhaton Road			38th Parkway					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	2	0	1	1	0	1	2	0	1
Entry Pocket Length [ft]	150.0	100.0	150.0	150.0	100.0	150.0	200.0	100.0	200.0	200.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	2	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Powhatan Road			Powhatan Road			38th Parkway					
Base Volume Input [veh/h]	73	974	614	64	711	30	20	113	132	151	31	406
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	307	0	0	15	0	0	66	0	0	203
Total Hourly Volume [veh/h]	73	974	307	64	711	15	20	113	66	151	31	203
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	20	265	83	17	193	4	5	31	18	41	8	55
Total Analysis Volume [veh/h]	79	1059	334	70	773	16	22	123	72	164	34	221
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtP	Permi	Permi	Protec	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	31	0	9	31	0	9	40	0	20	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	21	0	0	14	0	0	27	0	0	34	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	68	60	60	4	60	60	24	13	13	7	18	18
g / C, Green / Cycle	0.68	0.60	0.60	0.04	0.59	0.59	0.24	0.13	0.13	0.07	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.11	0.23	0.23	0.02	0.17	0.01	0.02	0.07	0.05	0.05	0.02	0.15
s, saturation flow rate [veh/h]	712	4584	1431	3113	4584	1431	1119	1683	1431	3113	1683	1431
c, Capacity [veh/h]	533	2732	852	135	2724	850	358	214	182	230	299	254
d1, Uniform Delay [s]	5.86	10.63	10.66	46.84	9.91	8.33	29.25	41.14	40.15	45.30	34.55	40.04
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.13	0.42	1.35	3.05	0.26	0.04	0.07	2.43	1.40	4.08	0.17	8.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.15	0.39	0.39	0.52	0.28	0.02	0.06	0.58	0.40	0.71	0.11	0.87
d, Delay for Lane Group [s/veh]	5.99	11.05	12.02	49.89	10.17	8.37	29.32	43.57	41.55	49.39	34.72	48.99
Lane Group LOS	A	B	B	D	B	A	C	D	D	D	C	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.52	3.93	3.95	0.91	2.66	0.15	0.41	2.98	1.69	2.11	0.71	5.85
50th-Percentile Queue Length [ft/ln]	12.97	98.19	98.72	22.65	66.50	3.63	10.34	74.54	42.29	52.72	17.68	146.3
95th-Percentile Queue Length [veh/ln]	0.93	7.07	7.11	1.63	4.79	0.26	0.74	5.37	3.04	3.80	1.27	9.82
95th-Percentile Queue Length [ft/ln]	23.34	176.7	177.6	40.77	119.7	6.53	18.61	134.1	76.12	94.90	31.82	245.5

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	5.99	11.05	12.02	49.89	10.17	8.37	29.32	43.57	41.55	49.39	34.72	48.99
Movement LOS	A	B	B	D	B	A	C	D	D	D	C	D
d_A, Approach Delay [s/veh]	10.99			13.37			41.45			47.99		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	19.14											
Intersection LOS	B											
Intersection V/C	0.421											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.42			41.42			41.42			41.42		
I_p,int, Pedestrian LOS Score for Intersection	3.517			3.233			2.405			2.985		
Crosswalk LOS	D			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	540			540			720			940		
d_b, Bicycle Delay [s]	26.66			26.66			20.50			14.06		
I_b,int, Bicycle LOS Score for Intersection	2.538			2.040			2.027			2.586		
Bicycle LOS	B			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Signal Warrants Report For Intersection 17: 42nd Avenue/Fultondale Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	100	50	0	150
2	97	49	0	146
3	95	48	0	143
4	89	45	0	134
5	79	40	0	119
6	78	39	0	117
7	77	39	0	116
8	70	35	0	105
9	69	35	0	103
10	68	34	0	102
11	59	30	0	89
12	55	28	0	83
13	54	27	0	81
14	40	20	0	60
15	40	20	0	60
16	28	14	0	42
17	16	8	0	24
18	16	8	0	24
19	9	5	0	14
20	5	3	0	8
21	3	2	0	5
22	1	1	0	2
23	1	1	0	2
24	1	1	0	2



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	150	3	150	No	No	No	No	No	No	No	No	No	No
2	2	146	3	146	No	No	No	No	No	No	No	No	No	No
3	2	143	3	143	No	No	No	No	No	No	No	No	No	No
4	2	134	3	134	No	No	No	No	No	No	No	No	No	No
5	2	119	3	119	No	No	No	No	No	No	No	No	No	No
6	2	117	3	117	No	No	No	No	No	No	No	No	No	No
7	2	116	3	116	No	No	No	No	No	No	No	No	No	No
8	2	105	3	105	No	No	No	No	No	No	No	No	No	No
9	2	104	3	103	No	No	No	No	No	No	No	No	No	No
10	2	102	3	102	No	No	No	No	No	No	No	No	No	No
11	2	89	3	89	No	No	No	No	No	No	No	No	No	No
12	2	83	3	83	No	No	No	No	No	No	No	No	No	No
13	2	81	3	81	No	No	No	No	No	No	No	No	No	No
14	2	60	3	60	No	No	No	No	No	No	No	No	No	No
15	2	60	3	60	No	No	No	No	No	No	No	No	No	No
16	2	42	3	42	No	No	No	No	No	No	No	No	No	No
17	2	24	3	24	No	No	No	No	No	No	No	No	No	No
18	2	24	3	24	No	No	No	No	No	No	No	No	No	No
19	2	14	3	14	No	No	No	No	No	No	No	No	No	No
20	2	8	3	8	No	No	No	No	No	No	No	No	No	No
21	2	5	3	5	No	No	No	No	No	No	No	No	No	No
22	2	2	3	2	No	No	No	No	No	No	No	No	No	No
23	2	2	3	2	No	No	No	No	No	No	No	No	No	No
24	2	2	3	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.6	9.6
Number of Lanes on Minor Street Approach	2	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	0:24
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	150
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	300	300
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Intersection Level Of Service Report
Intersection 1: 48th Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	39.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.306

Intersection Setup

Name	Main Street			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound		
Lane Configuration	L L R			L L R			L L L R		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	2	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	325.0	100.0	400.0	250.0	100.0	250.0	300.0	100.0	400.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.0
Speed [mph]	30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00		
Curb Present	No			No			No		
Crosswalk	Yes			Yes			Yes		

**Volumes**

Name	Main Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	75	7	86	104	7	40	166	642	158	114	754	182
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	43	0	0	40	0	0	79	0	0	91
Total Hourly Volume [veh/h]	75	7	43	104	7	0	166	642	79	114	754	91
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	20	2	12	28	2	0	45	174	21	31	205	25
Total Analysis Volume [veh/h]	82	8	47	113	8	0	180	698	86	124	820	99
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	43	0	15	43	0	12	30	0	12	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	34	0	0	34	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	50	50	5	51	51	8	23	23	6	21	21
g / C, Green / Cycle	0.05	0.50	0.50	0.05	0.51	0.51	0.08	0.23	0.23	0.06	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.03	0.00	0.03	0.04	0.00	0.00	0.06	0.15	0.06	0.04	0.18	0.07
s, saturation flow rate [veh/h]	3113	1683	1431	3113	1683	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	143	837	712	172	853	725	241	1049	327	183	964	301
d1, Uniform Delay [s]	46.81	12.71	13.08	46.37	12.24	0.00	45.25	35.12	31.68	46.20	38.03	33.55
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	3.60	0.02	0.18	4.21	0.02	0.00	4.61	0.73	0.42	4.35	2.22	0.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.57	0.01	0.07	0.66	0.01	0.00	0.75	0.67	0.26	0.68	0.85	0.33
d, Delay for Lane Group [s/veh]	50.41	12.73	13.26	50.58	12.26	0.00	49.86	35.86	32.10	50.55	40.25	34.18
Lane Group LOS	D	B	B	D	B	A	D	D	C	D	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.07	0.09	0.57	1.47	0.09	0.00	2.33	5.16	1.74	1.61	6.54	2.08
50th-Percentile Queue Length [ft/ln]	26.68	2.35	14.34	36.80	2.29	0.00	58.25	129.0	43.38	40.37	163.5	52.00
95th-Percentile Queue Length [veh/ln]	1.92	0.17	1.03	2.65	0.16	0.00	4.19	8.89	3.12	2.91	10.74	3.74
95th-Percentile Queue Length [ft/ln]	48.03	4.22	25.81	66.24	4.12	0.00	104.8	222.1	78.08	72.66	268.4	93.60

**Movement, Approach, & Intersection Results**

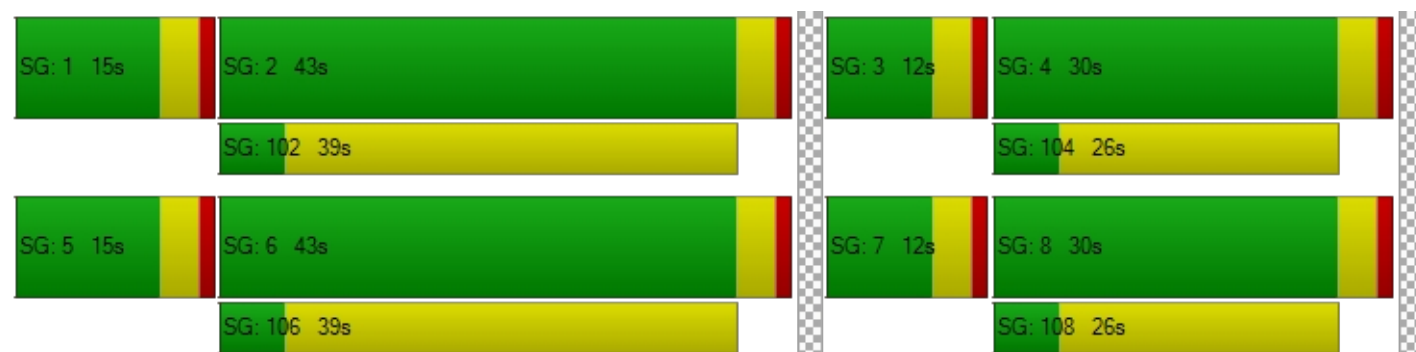
d_M, Delay for Movement [s/veh]	50.41	12.73	13.26	50.58	12.26	0.00	49.86	35.86	32.10	50.55	40.25	34.18
Movement LOS	D	B	B	D	B	A	D	D	C	D	D	C
d_A, Approach Delay [s/veh]	35.46			48.05			38.14			40.90		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.78											
Intersection LOS	D											
Intersection V/C	0.306											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	2.598			2.604			3.279			3.206		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	779			779			520			520		
d_b, Bicycle Delay [s]	18.63			18.63			27.41			27.41		
I_b,int, Bicycle LOS Score for Intersection	1.857			1.825			2.133			2.183		
Bicycle LOS	A			A			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report
Intersection 5: 48th Avenue/Denali Boulevard

Control Type:	Signalized	Delay (sec / veh):	28.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.429

Intersection Setup

Name	Denali Boulevard			Denali Boulevard			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	3	0	1	1	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	350.0	100.0	250.0	350.0	100.0	300.0	250.0	100.0	450.0	400.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	0.00	0.00	300.0
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Denali Boulevard			Denali Boulevard			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	197	85	138	127	159	301	89	619	342	285	680	85
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	138	0	0	151	0	0	171	0	0	43
Total Hourly Volume [veh/h]	197	85	0	127	159	150	89	619	171	285	680	42
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	54	23	0	35	43	41	24	168	46	77	185	11
Total Analysis Volume [veh/h]	214	92	0	138	173	163	97	673	186	310	739	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	48	0	9	43	0	23	36	0	17	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	37	0	0	34	0	0	27	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	20	20	29	15	15	5	56	56	13	64	64
g / C, Green / Cycle	0.09	0.18	0.18	0.26	0.14	0.14	0.05	0.51	0.51	0.12	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.00	0.11	0.05	0.11	0.03	0.15	0.13	0.10	0.16	0.03
s, saturation flow rate [veh/h]	3113	3204	1431	1279	3204	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	270	576	257	403	447	199	151	2347	732	364	2660	830
d1, Uniform Delay [s]	49.32	38.14	0.00	32.97	43.10	46.02	51.43	15.37	15.08	47.69	11.57	10.03
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering 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
d2, Incremental Delay [s]	5.26	0.13	0.00	0.50	0.55	7.97	4.47	0.31	0.83	5.69	0.26	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.79	0.16	0.00	0.34	0.39	0.82	0.64	0.29	0.25	0.85	0.28	0.06
d, Delay for Lane Group [s/veh]	54.58	38.27	0.00	33.47	43.65	53.99	55.91	15.68	15.91	53.38	11.83	10.16
Lane Group LOS	D	D	A	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.08	1.06	0.00	3.03	2.18	4.75	1.41	3.22	2.74	4.44	2.98	0.50
50th-Percentile Queue Length [ft/ln]	76.88	26.54	0.00	75.72	54.42	118.8	35.16	80.62	68.44	111.0	74.44	12.52
95th-Percentile Queue Length [veh/ln]	5.54	1.91	0.00	5.45	3.92	8.33	2.53	5.80	4.93	7.90	5.36	0.90
95th-Percentile Queue Length [ft/ln]	138.3	47.77	0.00	136.2	97.95	208.1	63.28	145.1	123.1	197.4	133.9	22.54

**Movement, Approach, & Intersection Results**

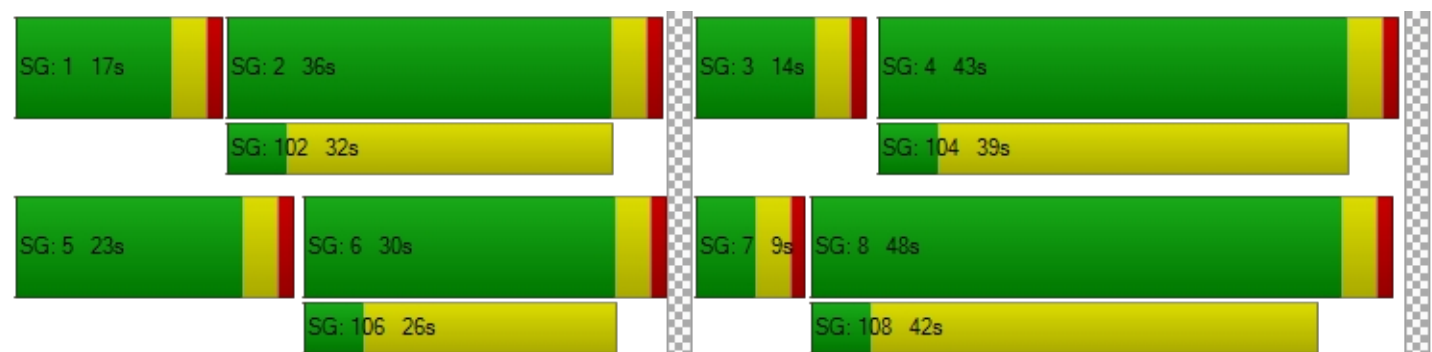
d_M, Delay for Movement [s/veh]	54.58	38.27	0.00	33.47	43.65	53.99	55.91	15.68	15.91	53.38	11.83	10.16
Movement LOS	D	D	A	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	49.68			44.24			19.81			23.52		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	28.56											
Intersection LOS	C											
Intersection V/C	0.429											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	46.39			46.39			46.39			46.39		
I_p,int, Pedestrian LOS Score for Intersection	2.980			2.826			3.363			3.281		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			709			582			473		
d_b, Bicycle Delay [s]	19.82			22.94			27.68			32.10		
I_b,int, Bicycle LOS Score for Intersection	1.926			2.075			2.179			2.186		
Bicycle LOS	A			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 12: 48th Avenue/Fultondale Street

Control Type:	Signalized	Delay (sec / veh):	11.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.216

Intersection Setup

Name	Fultondale Street						48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↶↷			↶↷			↶↷↷			↶↷↷		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	2	0	1	1	0	0	1	0	1	2	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	150.0	100.0	100.0	40.00	100.0	100.0	175.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Fultondale Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	66	12	48	8	22	22	11	633	125	59	311	10
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	24	0	0	11	0	0	63	0	0	5
Total Hourly Volume [veh/h]	66	12	24	8	22	11	11	633	62	59	311	5
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	18	3	7	2	6	3	3	172	17	16	85	1
Total Analysis Volume [veh/h]	72	13	26	9	24	12	12	688	67	64	338	5
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	ProtP	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	10	39	0	9	32	0	9	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	21	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	9	9	14	6	68	60	60	4	62	62
g / C, Green / Cycle	0.05	0.10	0.10	0.16	0.07	0.75	0.66	0.66	0.04	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.02	0.01	0.02	0.01	0.02	0.01	0.15	0.05	0.02	0.07	0.07
s, saturation flow rate [veh/h]	3113	1683	1431	1312	1589	967	4584	1431	3113	3204	1670
c, Capacity [veh/h]	148	172	147	319	107	813	3035	947	142	2217	1156
d1, Uniform Delay [s]	41.87	36.61	37.00	32.04	40.13	2.84	6.06	5.41	41.93	4.61	4.61
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.45	0.18	0.57	0.04	1.83	0.03	0.17	0.14	2.23	0.09	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.08	0.18	0.03	0.34	0.01	0.23	0.07	0.45	0.10	0.10
d, Delay for Lane Group [s/veh]	44.32	36.79	37.57	32.08	41.95	2.88	6.24	5.55	44.16	4.70	4.79
Lane Group LOS	D	D	D	C	D	A	A	A	D	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.82	0.27	0.54	0.17	0.81	0.05	1.54	0.43	0.73	0.61	0.66
50th-Percentile Queue Length [ft/ln]	20.58	6.64	13.55	4.19	20.21	1.18	38.54	10.67	18.26	15.19	16.58
95th-Percentile Queue Length [veh/ln]	1.48	0.48	0.98	0.30	1.46	0.09	2.77	0.77	1.31	1.09	1.19
95th-Percentile Queue Length [ft/ln]	37.04	11.95	24.39	7.55	36.38	2.13	69.37	19.21	32.87	27.34	29.85

**Movement, Approach, & Intersection Results**

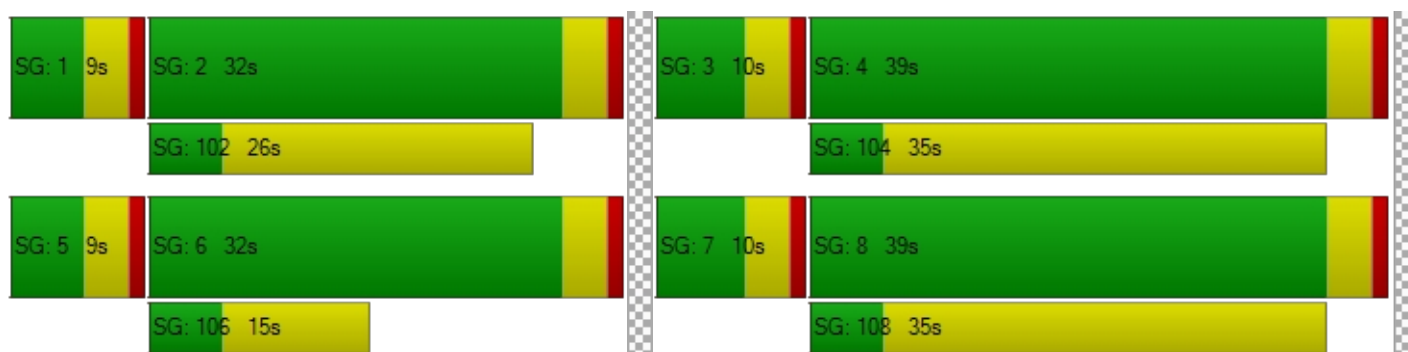
d_M, Delay for Movement [s/veh]	44.32	36.79	37.57	32.08	41.95	41.95	2.88	6.24	5.55	44.16	4.73	4.79
Movement LOS	D	D	D	C	D	D	A	A	A	D	A	A
d_A, Approach Delay [s/veh]	41.86			39.98			6.12			10.93		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	11.72											
Intersection LOS	B											
Intersection V/C	0.216											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.49			36.49			36.49			36.49		
I_p,int, Pedestrian LOS Score for Intersection	2.546			1.999			2.971			2.877		
Crosswalk LOS	B			A			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	777			777			622			622		
d_b, Bicycle Delay [s]	16.84			16.84			21.40			21.40		
I_b,int, Bicycle LOS Score for Intersection	1.782			1.652			2.016			1.786		
Bicycle LOS	A			A			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 16: 42nd Avenue/Denali Boulevard

Control Type:	Signalized	Delay (sec / veh):	8.8
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.146

Intersection Setup

Name	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	80	347	74	62	375	62	21	7	22	21	9	20
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	37	0	0	31	0	0	11	0	0	10
Total Hourly Volume [veh/h]	80	347	37	62	375	31	21	7	11	21	9	10
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	22	94	10	17	102	8	6	2	3	6	2	3
Total Analysis Volume [veh/h]	87	377	40	67	408	34	23	8	12	23	10	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	130
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	99	0	0	99	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	95	95	95	95	95	95	27	27	27	27	27	27
g / C, Green / Cycle	0.73	0.73	0.73	0.73	0.73	0.73	0.21	0.21	0.21	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.10	0.12	0.03	0.08	0.13	0.02	0.02	0.00	0.01	0.02	0.01	0.01
s, saturation flow rate [veh/h]	852	3204	1431	872	3204	1431	1252	1683	1431	1253	1683	1431
c, Capacity [veh/h]	632	2342	1045	648	2342	1045	290	350	297	292	350	297
d1, Uniform Delay [s]	7.59	5.34	4.85	7.23	5.40	4.83	43.71	41.00	41.15	43.60	41.05	41.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering 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
d2, Incremental Delay [s]	0.45	0.15	0.07	0.32	0.16	0.06	0.53	0.12	0.25	0.53	0.15	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.14	0.16	0.04	0.10	0.17	0.03	0.08	0.02	0.04	0.08	0.03	0.04
d, Delay for Lane Group [s/veh]	8.05	5.49	4.92	7.55	5.56	4.88	44.24	41.12	41.40	44.13	41.20	41.35
Lane Group LOS	A	A	A	A	A	A	D	D	D	D	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.93	1.51	0.30	0.69	1.65	0.25	0.66	0.22	0.33	0.66	0.27	0.30
50th-Percentile Queue Length [ft/ln]	23.34	37.72	7.53	17.21	41.28	6.37	16.57	5.46	8.31	16.54	6.84	7.61
95th-Percentile Queue Length [veh/ln]	1.68	2.72	0.54	1.24	2.97	0.46	1.19	0.39	0.60	1.19	0.49	0.55
95th-Percentile Queue Length [ft/ln]	42.01	67.90	13.56	30.97	74.30	11.47	29.83	9.83	14.96	29.78	12.31	13.70

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	8.05	5.49	4.92	7.55	5.56	4.88	44.24	41.12	41.40	44.13	41.20	41.35
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	5.88			5.78			42.87			42.77		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	8.76											
Intersection LOS	A											
Intersection V/C	0.146											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	56.31			56.31			56.31			56.31		
I_p,int, Pedestrian LOS Score for Intersection	2.719			2.705			2.500			2.310		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1462			1462			415			415		
d_b, Bicycle Delay [s]	4.71			4.71			40.80			40.80		
I_b,int, Bicycle LOS Score for Intersection	2.006			2.005			1.649			1.649		
Bicycle LOS	B			B			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 17: 42nd Avenue/Fultondale Street

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.019

Intersection Setup

Name	Fultondale Street			Fultondale Street			42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Fultondale Street			Fultondale Street			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	0	0	69	12	69	32	6	11	4	78	18
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	69	12	69	32	6	11	4	78	18
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	19	3	19	9	2	3	1	21	5
Total Analysis Volume [veh/h]	0	0	0	75	13	75	35	7	12	4	85	20
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.10	0.02	0.08	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.63	10.28	8.37	10.30	10.36	9.06	7.48	0.00	0.00	7.26	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.33	0.06	0.25	0.07	0.00	0.00	0.01	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	8.25	1.45	6.33	1.81	0.00	0.00	0.19	0.00	0.00
d_A, Approach Delay [s/veh]	9.76			9.73			4.85			0.27		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.76											
Intersection LOS	B											



Intersection Level Of Service Report
Intersection 20: 42nd Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	9.5
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.085

Intersection Setup

Name	Main Street		Main Street		42nd Avenue	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Main Street		Main Street		42nd Avenue	
Base Volume Input [veh/h]	197	53	63	137	23	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	27	0	0	0	14
Total Hourly Volume [veh/h]	197	26	63	137	23	13
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	7	17	37	6	4
Total Analysis Volume [veh/h]	214	28	68	149	25	14
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	6	0	0	2	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	33	0	0	33	27	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	R
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	29	23	23
g / C, Green / Cycle	0.48	0.48	0.48	0.48	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.07	0.07	0.05	0.01	0.01
s, saturation flow rate [veh/h]	1683	1617	1024	3204	3113	1431
c, Capacity [veh/h]	813	782	538	1549	1193	548
d1, Uniform Delay [s]	8.63	8.66	11.25	8.40	11.50	11.52
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.39	0.42	0.48	0.12	0.03	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.15	0.15	0.13	0.10	0.02	0.03
d, Delay for Lane Group [s/veh]	9.01	9.08	11.74	8.52	11.53	11.61
Lane Group LOS	A	A	B	A	B	B
Critical Lane Group	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.83	0.84	0.58	0.47	0.10	0.12
50th-Percentile Queue Length [ft/ln]	20.85	21.01	14.51	11.85	2.46	2.94
95th-Percentile Queue Length [veh/ln]	1.50	1.51	1.05	0.85	0.18	0.21
95th-Percentile Queue Length [ft/ln]	37.53	37.82	26.13	21.33	4.43	5.29

**Movement, Approach, & Intersection Results**

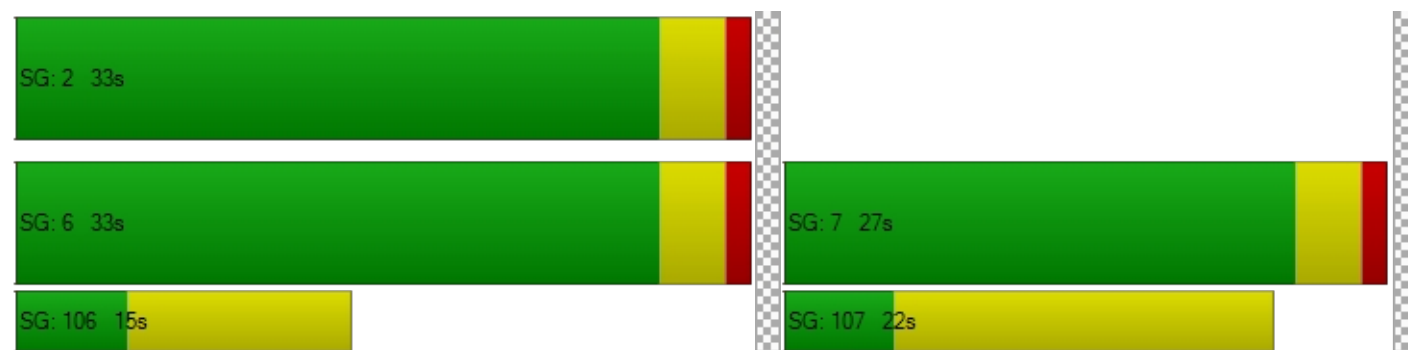
d_M, Delay for Movement [s/veh]	9.04	9.08	11.74	8.52	11.53	11.61
Movement LOS	A	A	B	A	B	B
d_A, Approach Delay [s/veh]	9.05		9.53		11.56	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	9.45					
Intersection LOS	A					
Intersection V/C	0.085					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.68	21.68	21.68
I_p,int, Pedestrian LOS Score for Intersection	2.258	2.370	2.271
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	767
d_b, Bicycle Delay [s]	8.01	8.01	11.41
I_b,int, Bicycle LOS Score for Intersection	1.782	1.739	1.560
Bicycle LOS	A	A	A

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








Intersection Level Of Service Report

Intersection 46: 48th Avenue/Harvest Road

Control Type:	Signalized	Delay (sec / veh):	29.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.396

Intersection Setup

Name	Harvest Road		48th Avenue		48th Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	3	0	0	1
Entry Pocket Length [ft]	450.00	200.00	400.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	2	0	1	0	1
Exit Pocket Length [ft]	0.00	174.61	0.00	400.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Harvest Road		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	517	263	427	623	195	213
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	263	0	0	0	213
Total Hourly Volume [veh/h]	517	0	427	623	195	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	140	0	116	169	53	0
Total Analysis Volume [veh/h]	562	0	464	677	212	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	7	0	5	2	6	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	5	0	5	10	10	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	46	0	28	64	36	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	37	0	0	10	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	19	79	56	56
g / C, Green / Cycle	0.21	0.21	0.17	0.72	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.18	0.00	0.15	0.21	0.07	0.00
s, saturation flow rate [veh/h]	3113	1431	3113	3204	3204	1431
c, Capacity [veh/h]	646	297	531	2306	1643	733
d1, Uniform Delay [s]	42.13	0.00	44.45	5.48	13.98	0.00
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.78	0.00	4.68	0.32	0.16	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.00	0.87	0.29	0.13	0.00
d, Delay for Lane Group [s/veh]	45.91	0.00	49.13	5.80	14.14	0.00
Lane Group LOS	D	A	D	A	B	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.65	0.00	6.47	2.54	1.40	0.00
50th-Percentile Queue Length [ft/ln]	191.27	0.00	161.68	63.56	34.99	0.00
95th-Percentile Queue Length [veh/ln]	12.19	0.00	10.64	4.58	2.52	0.00
95th-Percentile Queue Length [ft/ln]	304.68	0.00	265.95	114.41	62.99	0.00

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	45.91	0.00	49.13	5.80	14.14	0.00
Movement LOS	D	A	D	A	B	A
d_A, Approach Delay [s/veh]	45.91		23.42		14.14	
Approach LOS	D		C		B	
d_I, Intersection Delay [s/veh]	28.99					
Intersection LOS	C					
Intersection V/C	0.396					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.36	46.36	46.36
I_p,int, Pedestrian LOS Score for Intersection	3.188	2.934	3.037
Crosswalk LOS	C	C	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	764	1091	582
d_b, Bicycle Delay [s]	21.01	11.36	27.65
I_b,int, Bicycle LOS Score for Intersection	1.560	2.501	1.910
Bicycle LOS	A	B	A

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 47: 48th Avenue/Powhatan Road

Control Type:	Signalized	Delay (sec / veh):	22.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.474

Intersection Setup

Name	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	3	0	0	2	0	1	2	0	0	2	0	1
Entry Pocket Length [ft]	200.0	100.0	100.0	200.0	100.0	200.0	200.0	100.0	100.0	200.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Powhaton Road			Powhaton Road			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	200	1100	100	10	700	90	200	200	45	60	80	40
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	50	0	0	45	0	0	45	0	0	20
Total Hourly Volume [veh/h]	200	1100	50	10	700	45	200	200	0	60	80	20
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	54	299	14	3	190	12	54	54	0	16	22	5
Total Analysis Volume [veh/h]	217	1196	54	11	761	49	217	217	0	65	87	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	9	39	0	13	40	0	9	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	27	0	0	30	0	0	31	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	64	64	1	58	58	9	14	14	4	10	10
g / C, Green / Cycle	0.08	0.64	0.64	0.01	0.58	0.58	0.09	0.14	0.14	0.04	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.07	0.37	0.04	0.00	0.24	0.03	0.07	0.07	0.00	0.02	0.03	0.02
s, saturation flow rate [veh/h]	3113	3204	1431	3113	3204	1431	3113	3204	1431	3113	3204	1431
c, Capacity [veh/h]	251	2053	917	45	1841	822	277	456	203	133	307	137
d1, Uniform Delay [s]	45.48	10.31	6.72	48.81	11.90	9.39	44.66	39.52	0.00	46.85	42.06	41.56
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	8.58	1.22	0.12	2.81	0.69	0.14	4.80	0.77	0.00	2.74	0.50	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.86	0.58	0.06	0.25	0.41	0.06	0.78	0.48	0.00	0.49	0.28	0.16
d, Delay for Lane Group [s/veh]	54.06	11.53	6.84	51.62	12.58	9.53	49.45	40.29	0.00	49.58	42.56	42.10
Lane Group LOS	D	B	A	D	B	A	D	D	A	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.94	7.09	0.43	0.15	4.63	0.48	2.80	2.49	0.00	0.84	1.02	0.52
50th-Percentile Queue Length [ft/ln]	73.62	177.1	10.69	3.82	115.6	12.10	70.07	62.23	0.00	20.96	25.41	12.95
95th-Percentile Queue Length [veh/ln]	5.30	11.45	0.77	0.28	8.15	0.87	5.05	4.48	0.00	1.51	1.83	0.93
95th-Percentile Queue Length [ft/ln]	132.5	286.3	19.25	6.88	203.8	21.78	126.1	112.0	0.00	37.74	45.74	23.30

**Movement, Approach, & Intersection Results**

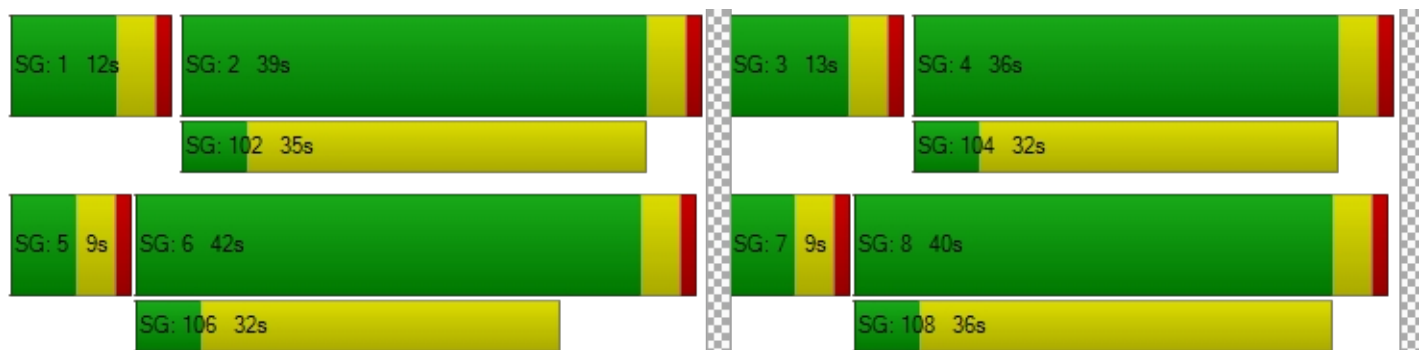
d_M, Delay for Movement [s/veh]	54.06	11.53	6.84	51.62	12.58	9.53	49.45	40.29	0.00	49.58	42.56	42.10
Movement LOS	D	B	A	D	B	A	D	D	A	D	D	D
d_A, Approach Delay [s/veh]	17.64			12.92			44.87			45.13		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	22.04											
Intersection LOS	C											
Intersection V/C	0.474											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	3.087			3.079			3.024			2.702		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	759			700			719			640		
d_b, Bicycle Delay [s]	19.25			21.16			20.51			23.15		
I_b,int, Bicycle LOS Score for Intersection	2.811			2.274			1.955			1.720		
Bicycle LOS	C			B			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 48: 38th Parkway/Powhatan Road

Control Type:	Signalized	Delay (sec / veh):	27.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.512

Intersection Setup

Name	Powhatan Road			Powhatan Road			38th Parkway					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	2	0	1	1	0	1	2	0	1
Entry Pocket Length [ft]	150.0	100.0	150.0	150.0	100.0	150.0	200.0	100.0	200.0	200.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	2	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Powhatan Road			Powhatan Road			38th Parkway					
Base Volume Input [veh/h]	152	974	168	64	711	30	20	78	83	597	111	406
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	84	0	0	15	0	0	42	0	0	203
Total Hourly Volume [veh/h]	152	974	84	64	711	15	20	78	41	597	111	203
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	41	265	23	17	193	4	5	21	11	162	30	55
Total Analysis Volume [veh/h]	165	1059	91	70	773	16	22	85	45	649	121	221
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtP	Permi	Permi	Protec	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	30	0	9	23	0	9	36	0	25	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	21	0	0	14	0	0	27	0	0	34	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	57	49	49	4	46	46	35	10	10	21	28	28
g / C, Green / Cycle	0.57	0.49	0.49	0.04	0.46	0.46	0.35	0.10	0.10	0.21	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.21	0.23	0.06	0.02	0.17	0.01	0.02	0.05	0.03	0.21	0.07	0.15
s, saturation flow rate [veh/h]	776	4584	1431	3113	4584	1431	1019	1683	1431	3113	1683	1431
c, Capacity [veh/h]	475	2238	698	137	2111	659	407	165	140	654	478	406
d1, Uniform Delay [s]	11.16	17.05	14.01	46.82	17.53	14.74	21.74	42.90	42.06	39.47	27.66	30.36
k, delay calibration	0.24	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	0.96	0.72	0.39	2.95	0.49	0.07	0.05	2.48	1.30	14.72	0.28	1.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.35	0.47	0.13	0.51	0.37	0.02	0.05	0.52	0.32	0.99	0.25	0.54
d, Delay for Lane Group [s/veh]	12.11	17.77	14.39	49.77	18.02	14.81	21.79	45.38	43.36	54.19	27.93	31.49
Lane Group LOS	B	B	B	D	B	B	C	D	D	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.78	5.35	1.17	0.90	3.84	0.21	0.35	2.10	1.08	9.16	2.25	4.57
50th-Percentile Queue Length [ft/ln]	44.55	133.6	29.37	22.62	96.01	5.20	8.66	52.52	27.05	228.9	56.36	114.3
95th-Percentile Queue Length [veh/ln]	3.21	9.14	2.11	1.63	6.91	0.37	0.62	3.78	1.95	14.12	4.06	8.08
95th-Percentile Queue Length [ft/ln]	80.19	228.4	52.87	40.71	172.8	9.36	15.58	94.53	48.70	352.9	101.4	202.0

**Movement, Approach, & Intersection Results**

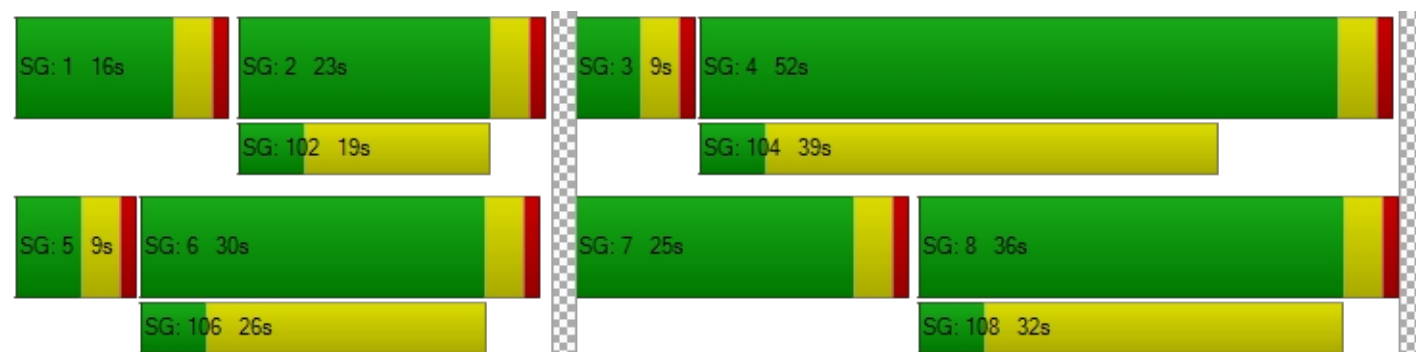
d_M, Delay for Movement [s/veh]	12.11	17.77	14.39	49.77	18.02	14.81	21.79	45.38	43.36	54.19	27.93	31.49
Movement LOS	B	B	B	D	B	B	C	D	D	D	C	C
d_A, Approach Delay [s/veh]	16.83			20.55			41.37			45.92		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	27.61											
Intersection LOS	C											
Intersection V/C	0.512											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	3.206			3.236			2.435			2.996		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	520			380			640			959		
d_b, Bicycle Delay [s]	27.41			32.84			23.15			13.55		
I_b,int, Bicycle LOS Score for Intersection	2.329			2.040			1.880			3.530		
Bicycle LOS	B			B			A			D		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Signal Warrants Report For Intersection 17: 42nd Avenue/Fultondale Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	100	49	0	150
2	97	48	0	146
3	95	47	0	143
4	89	44	0	134
5	79	39	0	119
6	78	38	0	117
7	77	38	0	116
8	70	34	0	105
9	69	34	0	103
10	68	33	0	102
11	59	29	0	89
12	55	27	0	83
13	54	26	0	81
14	40	20	0	60
15	40	20	0	60
16	28	14	0	42
17	16	8	0	24
18	16	8	0	24
19	9	4	0	14
20	5	2	0	8
21	3	1	0	5
22	1	0	0	2
23	1	0	0	2
24	1	0	0	2



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	149	3	150	No	No	No	No	No	No	No	No	No	No
2	2	145	3	146	No	No	No	No	No	No	No	No	No	No
3	2	142	3	143	No	No	No	No	No	No	No	No	No	No
4	2	133	3	134	No	No	No	No	No	No	No	No	No	No
5	2	118	3	119	No	No	No	No	No	No	No	No	No	No
6	2	116	3	117	No	No	No	No	No	No	No	No	No	No
7	2	115	3	116	No	No	No	No	No	No	No	No	No	No
8	2	104	3	105	No	No	No	No	No	No	No	No	No	No
9	2	103	3	103	No	No	No	No	No	No	No	No	No	No
10	2	101	3	102	No	No	No	No	No	No	No	No	No	No
11	2	88	3	89	No	No	No	No	No	No	No	No	No	No
12	2	82	3	83	No	No	No	No	No	No	No	No	No	No
13	2	80	3	81	No	No	No	No	No	No	No	No	No	No
14	2	60	3	60	No	No	No	No	No	No	No	No	No	No
15	2	60	3	60	No	No	No	No	No	No	No	No	No	No
16	2	42	3	42	No	No	No	No	No	No	No	No	No	No
17	2	24	3	24	No	No	No	No	No	No	No	No	No	No
18	2	24	3	24	No	No	No	No	No	No	No	No	No	No
19	2	13	3	14	No	No	No	No	No	No	No	No	No	No
20	2	7	3	8	No	No	No	No	No	No	No	No	No	No
21	2	4	3	5	No	No	No	No	No	No	No	No	No	No
22	2	1	3	2	No	No	No	No	No	No	No	No	No	No
23	2	1	3	2	No	No	No	No	No	No	No	No	No	No
24	2	1	3	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.8	9.7
Number of Lanes on Minor Street Approach	2	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	0:24
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	150
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	299	299
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	

Appendix D – Horizon With Project Analyses



Intersection Level Of Service Report
Intersection 1: 48th Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	39.1
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.334

Intersection Setup

Name	Main Street			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound		
Lane Configuration	T L T			T L T			T L T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	2	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	325.0	100.0	400.0	250.0	100.0	250.0	300.0	100.0	400.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.0
Speed [mph]	30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00		
Curb Present	No			No			No		
Crosswalk	Yes			Yes			Yes		

**Volumes**

Name	Main Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	99	5	64	218	24	66	89	688	189	63	795	63
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	31	0	2	0	0	0	0	20	11	5	56	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	33	0	0	66	0	0	100	0	0	32
Total Hourly Volume [veh/h]	130	5	33	218	24	0	89	708	100	68	851	31
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	35	1	9	59	7	0	24	192	27	18	231	8
Total Analysis Volume [veh/h]	141	5	36	237	26	0	97	770	109	74	925	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	43	0	14	46	0	13	34	0	9	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	34	0	0	34	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	46	46	10	49	49	5	24	24	4	24	24
g / C, Green / Cycle	0.06	0.46	0.46	0.10	0.49	0.49	0.05	0.24	0.24	0.04	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.05	0.00	0.03	0.08	0.02	0.00	0.03	0.17	0.08	0.02	0.20	0.02
s, saturation flow rate [veh/h]	3113	1683	1431	3113	1683	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	200	774	658	298	827	703	152	1100	343	139	1081	337
d1, Uniform Delay [s]	45.91	14.65	14.98	44.31	13.16	0.00	46.75	34.77	31.31	46.81	36.64	29.96
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering 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
d2, Incremental Delay [s]	4.47	0.02	0.16	4.81	0.07	0.00	4.38	0.82	0.53	3.14	2.07	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.70	0.01	0.05	0.79	0.03	0.00	0.64	0.70	0.32	0.53	0.86	0.10
d, Delay for Lane Group [s/veh]	50.38	14.67	15.14	49.12	13.23	0.00	51.13	35.59	31.84	49.95	38.72	30.09
Lane Group LOS	D	B	B	D	B	A	D	D	C	D	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.83	0.06	0.48	3.05	0.31	0.00	1.27	5.71	2.20	0.96	7.30	0.65
50th-Percentile Queue Length [ft/ln]	45.82	1.60	11.91	76.36	7.83	0.00	31.81	142.7	55.04	23.96	182.4	16.28
95th-Percentile Queue Length [veh/ln]	3.30	0.12	0.86	5.50	0.56	0.00	2.29	9.63	3.96	1.72	11.73	1.17
95th-Percentile Queue Length [ft/ln]	82.48	2.88	21.44	137.4	14.09	0.00	57.26	240.6	99.08	43.12	293.1	29.31

**Movement, Approach, & Intersection Results**

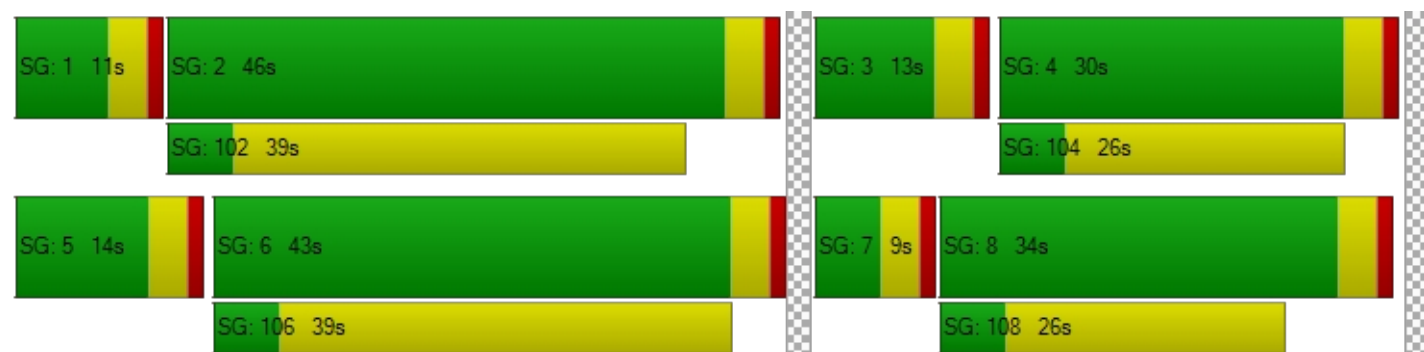
d_M, Delay for Movement [s/veh]	50.38	14.67	15.14	49.12	13.23	0.00	51.13	35.59	31.84	49.95	38.72	30.09
Movement LOS	D	B	B	D	B	A	D	D	C	D	D	C
d_A, Approach Delay [s/veh]	42.43			45.57			36.71			39.24		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.15											
Intersection LOS	D											
Intersection V/C	0.334											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	2.592			2.634			3.331			3.133		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	779			839			600			520		
d_b, Bicycle Delay [s]	18.63			16.85			24.53			27.41		
I_b,int, Bicycle LOS Score for Intersection	1.914			2.102			2.151			2.145		
Bicycle LOS	A			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 5: 48th Avenue/Denali Boulevard

Control Type:	Signalized	Delay (sec / veh):	26.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.384

Intersection Setup

Name	Denali Boulevard			Denali Boulevard			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	3	0	1	1	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	350.0	100.0	250.0	350.0	100.0	300.0	250.0	100.0	450.0	400.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	0.00	0.00	300.0
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Denali Boulevard			Denali Boulevard			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	201	76	143	135	238	214	84	637	329	185	796	70
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	3	2	0	0	22	0	0	61	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	143	0	0	107	0	0	165	0	0	40
Total Hourly Volume [veh/h]	201	81	0	138	240	107	84	659	164	185	857	39
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	55	22	0	38	65	29	23	179	45	50	233	11
Total Analysis Volume [veh/h]	218	88	0	150	261	116	91	716	178	201	932	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	48	0	9	43	0	23	39	0	14	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	37	0	0	34	0	0	27	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	17	17	26	12	12	5	63	63	9	67	67
g / C, Green / Cycle	0.09	0.15	0.15	0.23	0.11	0.11	0.05	0.58	0.58	0.08	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.00	0.12	0.08	0.08	0.03	0.16	0.12	0.06	0.20	0.03
s, saturation flow rate [veh/h]	3113	3204	1431	1296	3204	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	273	481	215	370	348	155	144	2639	823	257	2806	875
d1, Uniform Delay [s]	49.26	40.88	0.00	36.22	47.61	47.59	51.59	11.75	11.33	49.53	10.40	8.54
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	5.30	0.18	0.00	0.71	3.25	6.93	4.53	0.25	0.60	5.14	0.32	0.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.80	0.18	0.00	0.41	0.75	0.75	0.63	0.27	0.22	0.78	0.33	0.05
d, Delay for Lane Group [s/veh]	54.56	41.06	0.00	36.94	50.86	54.53	56.12	12.01	11.93	54.66	10.72	8.64
Lane Group LOS	D	D	A	D	D	D	E	B	B	D	B	A
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.13	1.06	0.00	3.48	3.62	3.38	1.32	2.91	2.18	2.89	3.57	0.41
50th-Percentile Queue Length [ft/ln]	78.32	26.43	0.00	87.01	90.49	84.40	33.06	72.70	54.58	72.19	89.28	10.31
95th-Percentile Queue Length [veh/ln]	5.64	1.90	0.00	6.26	6.52	6.08	2.38	5.23	3.93	5.20	6.43	0.74
95th-Percentile Queue Length [ft/ln]	140.9	47.58	0.00	156.6	162.8	151.9	59.52	130.8	98.24	129.9	160.7	18.55

**Movement, Approach, & Intersection Results**

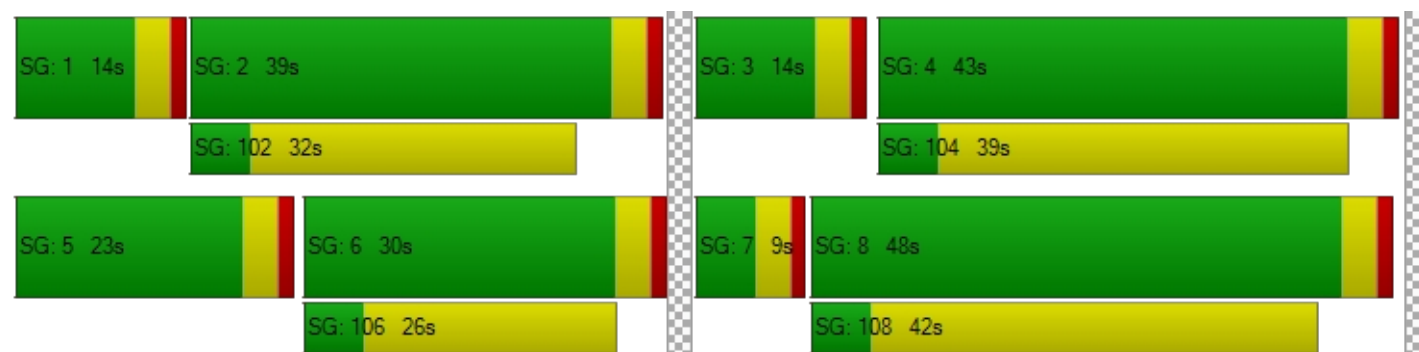
d_M, Delay for Movement [s/veh]	54.56	41.06	0.00	36.94	50.86	54.53	56.12	12.01	11.93	54.66	10.72	8.64
Movement LOS	D	D	A	D	D	D	E	B	B	D	B	A
d_A, Approach Delay [s/veh]	50.68			47.70			16.07			18.16		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	26.00											
Intersection LOS	C											
Intersection V/C	0.384											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	46.39			46.39			46.39			46.39		
I_p,int, Pedestrian LOS Score for Intersection	2.983			2.762			3.368			3.287		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			709			636			473		
d_b, Bicycle Delay [s]	19.82			22.94			25.59			32.10		
I_b,int, Bicycle LOS Score for Intersection	1.930			2.083			2.192			2.228		
Bicycle LOS	A			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 12: 48th Avenue/Fultondale Street

Control Type:	Signalized	Delay (sec / veh):	10.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.236

Intersection Setup

Name	Fultondale Street						48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵↵↵			↵↵			↵↵↵↵			↵↵↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	2	0	1	1	0	0	1	0	1	2	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	150.0	100.0	100.0	40.00	100.0	100.0	175.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Fultondale Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	73	4	49	0	24	24	9	716	43	28	350	2
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	0	0	0	0	25	0	3	70	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	28	0	0	12	0	0	22	0	0	1
Total Hourly Volume [veh/h]	73	4	27	0	24	12	9	741	21	31	420	1
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	20	1	7	0	7	3	2	201	6	8	114	0
Total Analysis Volume [veh/h]	79	4	29	0	26	13	10	805	23	34	457	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	ProtP	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	40	0	9	39	0	9	32	0	9	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	21	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	11	11	15	6	67	60	60	3	62	62
g / C, Green / Cycle	0.05	0.12	0.12	0.16	0.07	0.75	0.67	0.67	0.03	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.03	0.00	0.02	0.00	0.02	0.01	0.18	0.02	0.01	0.09	0.09
s, saturation flow rate [veh/h]	3113	1683	1431	1290	1589	877	4584	1431	3113	3204	1681
c, Capacity [veh/h]	153	199	169	327	112	736	3070	958	103	2208	1159
d1, Uniform Delay [s]	41.84	35.13	35.77	0.00	39.92	2.98	5.97	5.00	42.61	4.81	4.81
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.70	0.04	0.47	0.00	1.83	0.03	0.21	0.05	1.83	0.13	0.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.02	0.17	0.00	0.35	0.01	0.26	0.02	0.33	0.14	0.14
d, Delay for Lane Group [s/veh]	44.53	35.17	36.24	0.00	41.76	3.01	6.18	5.05	44.45	4.93	5.05
Lane Group LOS	D	D	D	A	D	A	A	A	D	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.91	0.08	0.59	0.00	0.87	0.04	1.80	0.14	0.39	0.84	0.92
50th-Percentile Queue Length [ft/ln]	22.63	1.98	14.76	0.00	21.81	1.03	44.92	3.43	9.82	21.07	23.06
95th-Percentile Queue Length [veh/ln]	1.63	0.14	1.06	0.00	1.57	0.07	3.23	0.25	0.71	1.52	1.66
95th-Percentile Queue Length [ft/ln]	40.74	3.56	26.57	0.00	39.26	1.86	80.85	6.17	17.68	37.93	41.50

**Movement, Approach, & Intersection Results**

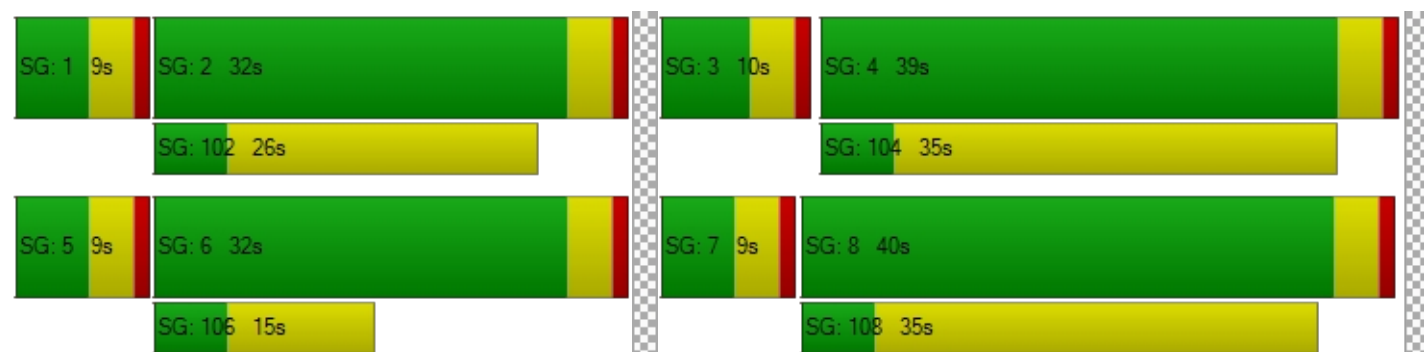
d_M, Delay for Movement [s/veh]	44.53	35.17	36.24	0.00	41.76	41.76	3.01	6.18	5.05	44.45	4.97	5.05
Movement LOS	D	D	D	A	D	D	A	A	A	D	A	A
d_A, Approach Delay [s/veh]	42.05			41.76			6.11			7.70		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.29											
Intersection LOS	B											
Intersection V/C	0.236											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.49			36.49			36.49			36.49		
I_p,int, Pedestrian LOS Score for Intersection	2.534			1.991			2.931			2.894		
Crosswalk LOS	B			A			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	799			777			622			622		
d_b, Bicycle Delay [s]	16.24			16.84			21.40			21.40		
I_b,int, Bicycle LOS Score for Intersection	1.791			1.644			2.033			1.831		
Bicycle LOS	A			A			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 16: 42nd Avenue/Denali Boulevard

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.169

Intersection Setup

Name	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	77	357	67	63	369	68	20	7	22	22	6	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	2	0	0	0	22	0	0	61	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	34	0	0	34	0	0	11	0	0	13
Total Hourly Volume [veh/h]	77	357	33	65	369	34	20	29	11	22	67	13
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	21	97	9	18	100	9	5	8	3	6	18	4
Total Analysis Volume [veh/h]	84	388	36	71	401	37	22	32	12	24	73	14
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	38	0	0	38	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	34	34	34	34	34	28	28	28	28	28	28
g / C, Green / Cycle	0.49	0.49	0.49	0.49	0.49	0.49	0.40	0.40	0.40	0.40	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.10	0.12	0.03	0.08	0.13	0.03	0.02	0.02	0.01	0.02	0.04	0.01
s, saturation flow rate [veh/h]	856	3204	1431	867	3204	1431	1179	1683	1431	1226	1683	1431
c, Capacity [veh/h]	431	1556	695	438	1556	695	509	673	572	544	673	572
d1, Uniform Delay [s]	14.75	10.53	9.50	14.36	10.58	9.50	15.34	12.84	12.71	14.63	13.17	12.72
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering 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
d2, Incremental Delay [s]	1.01	0.38	0.14	0.79	0.40	0.15	0.16	0.13	0.07	0.15	0.32	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.19	0.25	0.05	0.16	0.26	0.05	0.04	0.05	0.02	0.04	0.11	0.02
d, Delay for Lane Group [s/veh]	15.75	10.92	9.64	15.15	10.98	9.65	15.50	12.98	12.77	14.78	13.50	12.80
Lane Group LOS	B	B	A	B	B	A	B	B	B	B	B	B
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.97	1.65	0.29	0.80	1.72	0.30	0.24	0.31	0.12	0.26	0.73	0.14
50th-Percentile Queue Length [ft/ln]	24.21	41.34	7.25	19.91	42.94	7.46	6.09	7.79	2.92	6.43	18.27	3.42
95th-Percentile Queue Length [veh/ln]	1.74	2.98	0.52	1.43	3.09	0.54	0.44	0.56	0.21	0.46	1.32	0.25
95th-Percentile Queue Length [ft/ln]	43.58	74.41	13.05	35.84	77.29	13.43	10.97	14.01	5.26	11.57	32.89	6.15

**Movement, Approach, & Intersection Results**

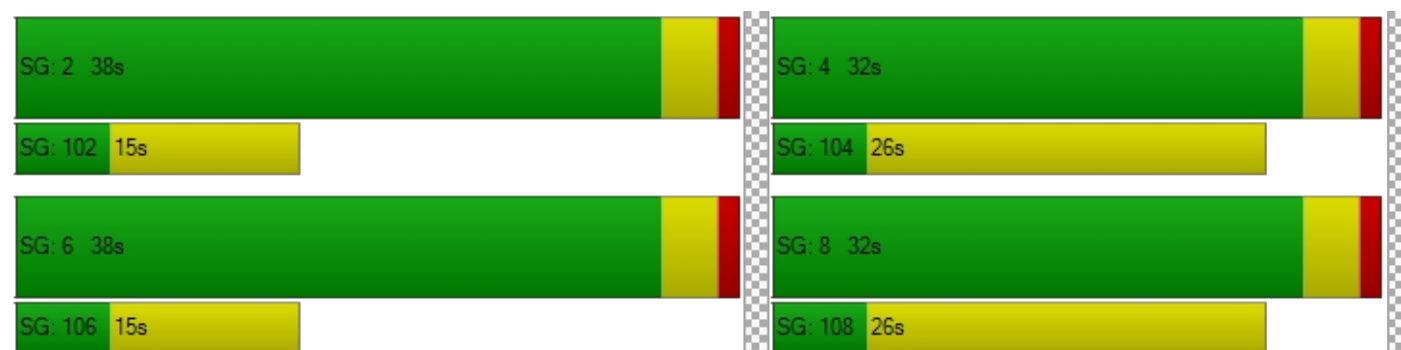
d_M, Delay for Movement [s/veh]	15.75	10.92	9.64	15.15	10.98	9.65	15.50	12.98	12.77	14.78	13.50	12.80
Movement LOS	B	B	A	B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	11.63			11.47			13.78			13.69		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	11.87											
Intersection LOS	B											
Intersection V/C	0.169											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	26.58			26.58			26.58			26.58		
I_p,int, Pedestrian LOS Score for Intersection	2.685			2.681			2.483			2.312		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	971			971			800			800		
d_b, Bicycle Delay [s]	9.26			9.26			12.60			12.60		
I_b,int, Bicycle LOS Score for Intersection	2.007			2.008			1.687			1.764		
Bicycle LOS	B			B			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 17: 42nd Avenue/Fultondale Street

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.111

Intersection Setup

Name	Fultondale Street			Fultondale Street			42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Fultondale Street			Fultondale Street			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	0	0	69	18	63	11	36	3	3	72	25
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	1	0	2	1	23	0	0	64	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	70	18	65	12	59	3	3	136	30
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	19	5	18	3	16	1	1	37	8
Total Analysis Volume [veh/h]	0	0	0	76	20	71	13	64	3	3	148	33
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.11	0.03	0.08	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.34	10.78	8.61	10.93	10.86	9.45	7.61	0.00	0.00	7.35	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.37	0.10	0.26	0.03	0.00	0.00	0.01	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	9.34	2.44	6.56	0.71	0.00	0.00	0.15	0.00	0.00
d_A, Approach Delay [s/veh]	10.24			10.29			1.24			0.12		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.27											
Intersection LOS	B											



Intersection Level Of Service Report
Intersection 20: 42nd Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	9.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.101

Intersection Setup

Name	Main Street		Main Street		42nd Avenue	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Main Street		Main Street		42nd Avenue	
Base Volume Input [veh/h]	200	5	65	135	24	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	11	11	5	30	31
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	8	0	0	0	29
Total Hourly Volume [veh/h]	202	8	76	140	54	28
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	2	21	38	15	8
Total Analysis Volume [veh/h]	220	9	83	152	59	30
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	6	0	0	2	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	33	0	0	33	27	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	R
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	29	23	23
g / C, Green / Cycle	0.48	0.48	0.48	0.48	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.07	0.08	0.05	0.02	0.02
s, saturation flow rate [veh/h]	1683	1660	1036	3204	3113	1431
c, Capacity [veh/h]	813	802	547	1549	1193	548
d1, Uniform Delay [s]	8.59	8.60	11.29	8.41	11.63	11.65
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.36	0.37	0.59	0.13	0.08	0.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.14	0.15	0.10	0.05	0.05
d, Delay for Lane Group [s/veh]	8.96	8.97	11.87	8.53	11.71	11.84
Lane Group LOS	A	A	B	A	B	B
Critical Lane Group	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.79	0.79	0.71	0.48	0.24	0.26
50th-Percentile Queue Length [ft/ln]	19.64	19.69	17.84	12.10	5.88	6.39
95th-Percentile Queue Length [veh/ln]	1.41	1.42	1.28	0.87	0.42	0.46
95th-Percentile Queue Length [ft/ln]	35.34	35.44	32.12	21.79	10.59	11.50

**Movement, Approach, & Intersection Results**

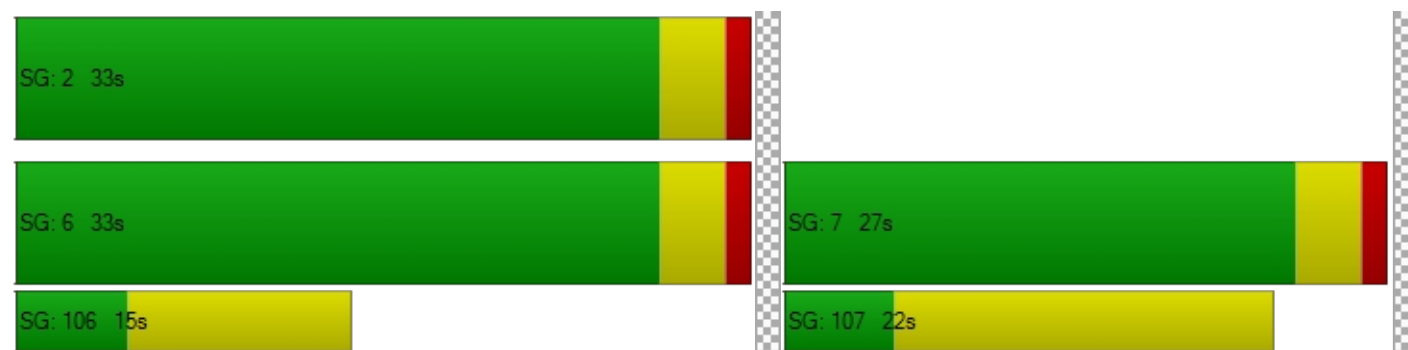
d_M, Delay for Movement [s/veh]	8.96	8.97	11.87	8.53	11.71	11.84
Movement LOS	A	A	B	A	B	B
d_A, Approach Delay [s/veh]	8.96		9.71		11.75	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	9.73					
Intersection LOS	A					
Intersection V/C	0.101					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.68	21.68	21.68
I_p,int, Pedestrian LOS Score for Intersection	2.232	2.381	2.324
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	767
d_b, Bicycle Delay [s]	8.01	8.01	11.41
I_b,int, Bicycle LOS Score for Intersection	1.755	1.753	1.560
Bicycle LOS	A	A	A

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 23: 42nd Ave/PA 13.1 Access 2

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 7.6
 Level Of Service: A
 Volume to Capacity (v/c): 0.002

Intersection Setup

Name							42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+ +			+ +		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name							42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	0	0	0	0	0	3	96	1	2	96	2
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	24	0	0	69	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	0	0	3	120	1	2	165	2
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	0	1	33	0	1	45	1
Total Analysis Volume [veh/h]	0	0	0	0	0	0	3	130	1	2	179	2
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.71	11.06	8.92	10.71	11.06	9.17	7.59	0.00	0.00	7.48	0.00	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.10	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.23			10.32			0.17			0.08			
Approach LOS	B			B			A			A			
d_I, Intersection Delay [s/veh]	0.12												
Intersection LOS	A												



Intersection Level Of Service Report Intersection 24: 48th Ave/Road D

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 13.5
Level Of Service: B
Volume to Capacity (v/c): 0.049

Intersection Setup

Name			48th Avenue		48th Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			48th Avenue		48th Avenue	
Base Volume Input [veh/h]	0	0	1079	0	0	424
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	29	20	18	12	9	47
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	20	1097	12	9	471
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	5	298	3	2	128
Total Analysis Volume [veh/h]	32	22	1192	13	10	512
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.05	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	13.47	0.00	0.00	0.00	0.00
Movement LOS		B	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.15	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	3.87	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.47		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.17					
Intersection LOS	B					



Intersection Level Of Service Report

Intersection 25: 48th Avenue/PA-31 Street

Control Type:	Two-way stop	Delay (sec / veh):	18.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.204

Intersection Setup

Name	PA-31 Street		48th Avenue		48th Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	1	0
Entry Pocket Length [ft]	200.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	PA-31 Street		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	20	71	445	0	0	370
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	45	32	22	16	12	11
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	103	467	16	12	381
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	28	127	4	3	104
Total Analysis Volume [veh/h]	71	112	508	17	13	414
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.15	0.01	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	18.01	10.68	0.00	0.00	8.51	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.75	0.53	0.00	0.00	0.04	0.00
95th-Percentile Queue Length [ft/ln]	18.86	13.17	0.00	0.00	0.95	0.00
d_A, Approach Delay [s/veh]	13.52		0.00		0.26	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.28					
Intersection LOS	C					



Intersection Level Of Service Report

Intersection 26: Reserve Loop/PA-31 Street

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.028

Intersection Setup

Name	PA-31 Street		Reserve Loop		Reserve Loop	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	PA-31 Street		Reserve Loop		Reserve Loop	
Base Volume Input [veh/h]	0	0	91	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	77	24	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	28	168	24	6	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	8	46	7	2	0
Total Analysis Volume [veh/h]	0	30	183	26	7	0
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.03	0.11	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.69	8.44	7.52	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.09	0.38	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	2.15	9.57	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.44		6.58		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.62					
Intersection LOS	A					



Intersection Level Of Service Report Intersection 27: Reserve Loop/Road C

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 8.5
Level Of Service: A
Volume to Capacity (v/c): 0.013

Intersection Setup

Name			Reserve Loop		Reserve Loop	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			Reserve Loop		Reserve Loop	
Base Volume Input [veh/h]	0	0	0	91	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	1	101	34	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	12	1	192	34	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	3	0	52	9	0
Total Analysis Volume [veh/h]	0	13	1	209	37	0
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.91	8.52	7.29	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.95	0.95	0.04	0.04	0.00	0.00
d_A, Approach Delay [s/veh]	8.52		0.03		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.45					
Intersection LOS	A					



Intersection Level Of Service Report

Intersection 28: Reserve Loop/Road B

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 10.7
 Level Of Service: B
 Volume to Capacity (v/c): 0.041

Intersection Setup

Name	Reserve Loop			Reserve Loop								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+ +			+			+ +		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Reserve Loop			Reserve Loop								
Base Volume Input [veh/h]	0	91	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	26	8	17	17	13	25	0	18	20	0	51
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	117	8	17	17	13	25	0	18	20	0	51
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	2	32	2	5	5	4	7	0	5	5	0	14
Total Analysis Volume [veh/h]	9	127	9	18	18	14	27	0	20	22	0	55
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.02	0.03	0.00	0.06
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.52	0.00	0.00	10.74	10.66	8.72	10.25	10.55	9.17
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	0.04	0.00	0.00	0.19	0.19	0.19	0.10	0.10	0.19
95th-Percentile Queue Length [ft/ln]	0.38	0.38	0.38	0.94	0.00	0.00	4.77	4.77	4.77	2.40	2.40	4.77
d_A, Approach Delay [s/veh]	0.45			2.71			9.88			9.48		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	4.37											
Intersection LOS	B											



Intersection Level Of Service Report Intersection 29: Reserve Loop/Road A

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 10.9
Level Of Service: B
Volume to Capacity (v/c): 0.054

Intersection Setup

Name	Reserve Loop			Reserve Loop								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Reserve Loop			Reserve Loop								
Base Volume Input [veh/h]	0	91	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	29	11	1	55	0	12	0	49	32	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	120	11	1	55	0	12	0	49	32	0	0
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	4	33	3	0	15	0	3	0	13	9	0	0
Total Analysis Volume [veh/h]	17	130	12	1	60	0	13	0	53	35	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.05	0.05	0.00	0.00
d_M, Delay for Movement [s/veh]	7.36	0.00	0.00	7.50	0.00	0.00	10.33	10.79	8.88	10.85	10.45	8.94
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.03	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.23	0.17	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.84	0.00	0.00	0.04	0.04	0.04	5.71	5.71	5.71	4.26	0.00	0.00
d_A, Approach Delay [s/veh]	0.79			0.12			9.16			10.85		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	3.48											
Intersection LOS	B											



Intersection Level Of Service Report

Intersection 30: 42nd Avenue/Reserve Loop

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.161

Intersection Setup

Name	Reserve Loop		Reserve Loop		42nd Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Reserve Loop		Reserve Loop		42nd Avenue	
Base Volume Input [veh/h]	93	55	50	48	36	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	14	37	80	56	19	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	52	0	34
Total Hourly Volume [veh/h]	107	92	130	52	55	33
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	25	35	14	15	9
Total Analysis Volume [veh/h]	116	100	141	57	60	36
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	0	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	10	10	0	5	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	34	34	0	26	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	5	5	0	5	0
Pedestrian Clearance [s]	0	10	10	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	R
C, Cycle Length [s]	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	30	30	30	22	22
g / C, Green / Cycle	0.50	0.50	0.50	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.11	0.06	0.12	0.04	0.03
s, saturation flow rate [veh/h]	1066	1683	1602	1603	1431
c, Capacity [veh/h]	542	841	801	588	525
d1, Uniform Delay [s]	12.28	7.97	8.56	12.50	12.34
k, delay calibration	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.90	0.29	0.74	0.35	0.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.21	0.12	0.25	0.10	0.07
d, Delay for Lane Group [s/veh]	13.18	8.26	9.29	12.85	12.60
Lane Group LOS	B	A	A	B	B
Critical Lane Group	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	1.07	0.65	1.40	0.53	0.32
50th-Percentile Queue Length [ft/ln]	26.76	16.17	34.88	13.37	8.00
95th-Percentile Queue Length [veh/ln]	1.93	1.16	2.51	0.96	0.58
95th-Percentile Queue Length [ft/ln]	48.17	29.10	62.78	24.07	14.41

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	13.18	8.26	9.29	9.29	12.85	12.60
Movement LOS	B	A	A	A	B	B
d_A, Approach Delay [s/veh]	10.90		9.29		12.75	
Approach LOS	B		A		B	
d_I, Intersection Delay [s/veh]	10.63					
Intersection LOS	B					
Intersection V/C	0.161					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.68	21.68	21.68
I_p,int, Pedestrian LOS Score for Intersection	2.060	2.128	2.250
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1000	1000	733
d_b, Bicycle Delay [s]	7.50	7.50	12.03
I_b,int, Bicycle LOS Score for Intersection	1.916	1.972	1.560
Bicycle LOS	A	A	A

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 40: 38th Parkway/Reserve Loop (W)

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.044

Intersection Setup

Name	Reserve Loop		38th Parkway		38th Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Reserve Loop		38th Parkway		38th Parkway	
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	38	53	20	2	4	12
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	53	20	2	4	12
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	14	5	1	1	3
Total Analysis Volume [veh/h]	41	58	22	2	4	13
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.05	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.22	8.75	7.28	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.32	0.32	0.04	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	8.11	8.11	1.05	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.95		6.67		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.47					
Intersection LOS	A					



Intersection Level Of Service Report

Intersection 41: 38th Parkway/Road E

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 0.0
 Level Of Service: A
 Volume to Capacity (v/c): 0.001

Intersection Setup

Name			38th Parkway		38th Parkway	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			38th Parkway		38th Parkway	
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	21	0	0	57
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	21	0	0	57
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	6	0	0	15
Total Analysis Volume [veh/h]	0	0	23	0	0	62
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.93	8.42	0.00	0.00	7.26	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.67		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

**Intersection Level Of Service Report****Intersection 42: The Aurora Highlands Parkway/38th Parkway**

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name	38th Parkway			38th Parkway			Th Au			Th Au		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	38th Parkway			38th Parkway			Th Au			Th Au		
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	9	48	0	0	0	0	0	0	21
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	9	48	0	0	0	0	0	0	21
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	2	13	0	0	0	0	0	0	6
Total Analysis Volume [veh/h]	0	0	0	10	52	0	0	0	0	0	0	23
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance				No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	7.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.80	9.29	8.39
Movement LOS	A	A			A	A					A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.62
d_A, Approach Delay [s/veh]	3.66			0.00			0.00			8.39			
Approach LOS	A			A			A			A			
d_I, Intersection Delay [s/veh]	2.57												
Intersection LOS	A												

**Intersection Level Of Service Report****Intersection 43: The Aurora Highlands Parkway/38th Parkway**

Control Type:	Two-way stop	Delay (sec / veh):	8.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.051

Intersection Setup

Name	38th Parkway		Th Au			
Approach	Southbound		Eastbound		Westbound	
Lane Configuration	↰		↱			
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	38th Parkway		Th Au			
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	48	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	0	0	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	0	0	0	0
Total Analysis Volume [veh/h]	52	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.71	0.00	0.00	0.00	0.00	0.00
Movement LOS	A		A	A		
95th-Percentile Queue Length [veh/ln]	0.16	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	4.01	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.71		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	8.71					
Intersection LOS	A					






Intersection Level Of Service Report

Intersection 46: 48th Avenue/Harvest Road

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.415

Intersection Setup

Name	Harvest Road		48th Avenue		48th Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	3	0	0	1
Entry Pocket Length [ft]	450.00	200.00	400.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	2	0	1	0	1
Exit Pocket Length [ft]	0.00	174.61	0.00	400.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Harvest Road		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	493	287	464	586	166	242
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	2	5	25	61	15
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	289	0	0	0	257
Total Hourly Volume [veh/h]	498	0	469	611	227	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	135	0	127	166	62	0
Total Analysis Volume [veh/h]	541	0	510	664	247	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	7	0	5	2	6	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	5	0	5	10	10	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	46	0	28	64	36	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	37	0	0	10	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	20	80	56	56
g / C, Green / Cycle	0.20	0.20	0.18	0.73	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.17	0.00	0.16	0.21	0.08	0.00
s, saturation flow rate [veh/h]	3113	1431	3113	3204	3204	1431
c, Capacity [veh/h]	624	287	574	2328	1621	724
d1, Uniform Delay [s]	42.53	0.00	43.74	5.18	14.55	0.00
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.80	0.00	4.91	0.31	0.20	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.00	0.89	0.29	0.15	0.00
d, Delay for Lane Group [s/veh]	46.33	0.00	48.64	5.49	14.75	0.00
Lane Group LOS	D	A	D	A	B	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.38	0.00	7.11	2.39	1.68	0.00
50th-Percentile Queue Length [ft/ln]	184.52	0.00	177.75	59.74	41.99	0.00
95th-Percentile Queue Length [veh/ln]	11.84	0.00	11.48	4.30	3.02	0.00
95th-Percentile Queue Length [ft/ln]	295.90	0.00	287.08	107.54	75.58	0.00

**Movement, Approach, & Intersection Results**

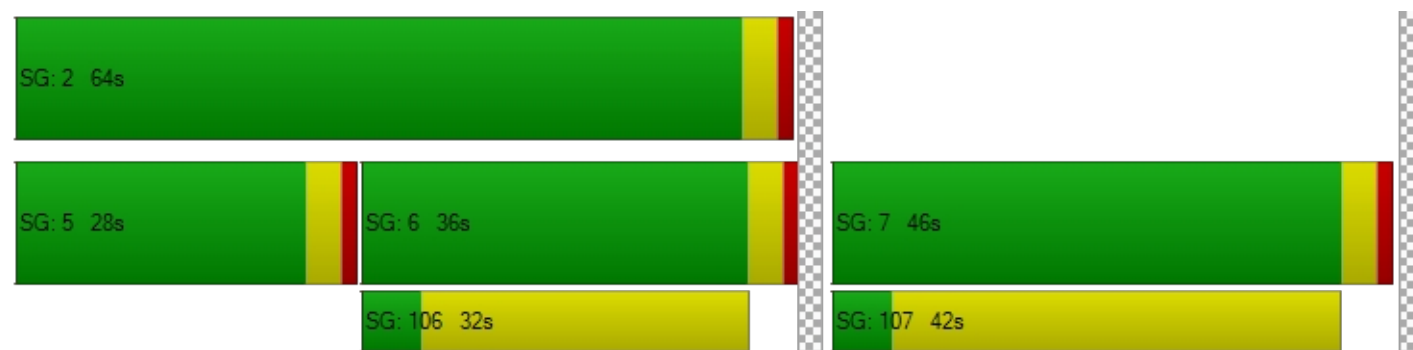
d_M, Delay for Movement [s/veh]	46.33	0.00	48.64	5.49	14.75	0.00
Movement LOS	D	A	D	A	B	A
d_A, Approach Delay [s/veh]	46.33		24.24		14.75	
Approach LOS	D		C		B	
d_I, Intersection Delay [s/veh]	29.13					
Intersection LOS	C					
Intersection V/C	0.415					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.36	46.36	46.36
I_p,int, Pedestrian LOS Score for Intersection	3.239	2.945	3.107
Crosswalk LOS	C	C	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	764	1091	582
d_b, Bicycle Delay [s]	21.01	11.36	27.65
I_b,int, Bicycle LOS Score for Intersection	1.560	2.528	1.975
Bicycle LOS	A	B	A

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 47: 48th Avenue/Powhatan Road

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.484

Intersection Setup

Name	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	3	0	0	2	0	1	2	0	0	2	0	1
Entry Pocket Length [ft]	200.0	100.0	100.0	200.0	100.0	200.0	200.0	100.0	100.0	200.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	200	1100	100	10	700	90	200	200	45	60	80	40
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	0	0	0	0	8	22	22	10	0	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	50	0	0	49	0	0	55	0	0	20
Total Hourly Volume [veh/h]	207	1100	50	10	700	49	222	222	0	60	88	20
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	56	299	14	3	190	13	60	60	0	16	24	5
Total Analysis Volume [veh/h]	225	1196	54	11	761	53	241	241	0	65	96	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	9	39	0	13	40	0	9	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	27	0	0	30	0	0	31	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	64	64	1	57	57	9	14	14	4	10	10
g / C, Green / Cycle	0.08	0.64	0.64	0.01	0.57	0.57	0.09	0.14	0.14	0.04	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.07	0.37	0.04	0.00	0.24	0.04	0.08	0.08	0.00	0.02	0.03	0.02
s, saturation flow rate [veh/h]	3113	3204	1431	3113	3204	1431	3113	3204	1431	3113	3204	1431
c, Capacity [veh/h]	251	2045	913	45	1832	818	282	464	207	133	311	139
d1, Uniform Delay [s]	45.61	10.46	6.81	48.81	12.04	9.53	44.87	39.60	0.00	46.85	42.09	41.47
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	10.76	1.23	0.12	2.81	0.70	0.15	7.24	0.90	0.00	2.74	0.56	0.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.90	0.58	0.06	0.25	0.42	0.06	0.85	0.52	0.00	0.49	0.31	0.16
d, Delay for Lane Group [s/veh]	56.37	11.69	6.94	51.62	12.74	9.69	52.12	40.50	0.00	49.58	42.65	41.99
Lane Group LOS	E	B	A	D	B	A	D	D	A	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.13	7.16	0.43	0.15	4.66	0.53	3.21	2.78	0.00	0.84	1.12	0.52
50th-Percentile Queue Length [ft/ln]	78.15	179.0	10.80	3.82	116.6	13.24	80.25	69.51	0.00	20.96	28.10	12.92
95th-Percentile Queue Length [veh/ln]	5.63	11.55	0.78	0.28	8.21	0.95	5.78	5.00	0.00	1.51	2.02	0.93
95th-Percentile Queue Length [ft/ln]	140.6	288.8	19.45	6.88	205.1	23.83	144.4	125.1	0.00	37.74	50.58	23.26

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	56.37	11.69	6.94	51.62	12.74	9.69	52.12	40.50	0.00	49.58	42.65	41.99
Movement LOS	E	B	A	D	B	A	D	D	A	D	D	D
d_A, Approach Delay [s/veh]	18.33			13.06			46.31			45.03		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	23.06											
Intersection LOS	C											
Intersection V/C	0.484											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	3.088			3.089			3.041			2.707		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	759			700			719			640		
d_b, Bicycle Delay [s]	19.25			21.16			20.51			23.15		
I_b,int, Bicycle LOS Score for Intersection	2.818			2.281			2.003			1.727		
Bicycle LOS	C			B			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 48: 38th Parkway/Powhaton Road

Control Type:	Signalized	Delay (sec / veh):	19.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.421

Intersection Setup

Name	Powhaton Road			Powhaton Road			38th Parkway					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	2	0	1	1	0	1	2	0	1
Entry Pocket Length [ft]	150.0	100.0	150.0	150.0	100.0	150.0	200.0	100.0	200.0	200.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	2	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Powhaton Road			Powhaton Road			38th Parkway					
Base Volume Input [veh/h]	73	974	614	64	711	30	20	113	132	151	31	406
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	7	0	0	10	0	0	0	58	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	307	0	0	15	0	0	95	0	0	203
Total Hourly Volume [veh/h]	90	981	307	64	721	15	20	113	95	151	31	203
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	24	267	83	17	196	4	5	31	26	41	8	55
Total Analysis Volume [veh/h]	98	1066	334	70	784	16	22	123	103	164	34	221
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtP	Permi	Permi	Protec	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	30	0	9	24	0	9	39	0	22	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	21	0	0	14	0	0	27	0	0	34	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	68	60	60	4	59	59	24	13	13	7	18	18
g / C, Green / Cycle	0.68	0.60	0.60	0.04	0.59	0.59	0.24	0.13	0.13	0.07	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.14	0.23	0.23	0.02	0.17	0.01	0.02	0.07	0.07	0.05	0.02	0.15
s, saturation flow rate [veh/h]	710	4584	1431	3113	4584	1431	1119	1683	1431	3113	1683	1431
c, Capacity [veh/h]	531	2731	852	135	2714	847	358	213	181	231	299	254
d1, Uniform Delay [s]	5.97	10.65	10.66	46.84	10.05	8.43	29.25	41.17	41.12	45.27	34.55	40.04
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	0.17	0.42	1.35	3.05	0.27	0.04	0.07	2.45	2.78	4.01	0.17	8.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.18	0.39	0.39	0.52	0.29	0.02	0.06	0.58	0.57	0.71	0.11	0.87
d, Delay for Lane Group [s/veh]	6.14	11.07	12.02	49.89	10.32	8.47	29.32	43.62	43.90	49.28	34.72	48.98
Lane Group LOS	A	B	B	D	B	A	C	D	D	D	C	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.65	3.96	3.95	0.91	2.73	0.15	0.41	2.98	2.51	2.11	0.71	5.85
50th-Percentile Queue Length [ft/ln]	16.31	99.04	98.72	22.65	68.16	3.65	10.34	74.59	62.85	52.66	17.68	146.3
95th-Percentile Queue Length [veh/ln]	1.17	7.13	7.11	1.63	4.91	0.26	0.74	5.37	4.53	3.79	1.27	9.82
95th-Percentile Queue Length [ft/ln]	29.36	178.2	177.7	40.77	122.6	6.57	18.61	134.2	113.1	94.78	31.82	245.5

**Movement, Approach, & Intersection Results**

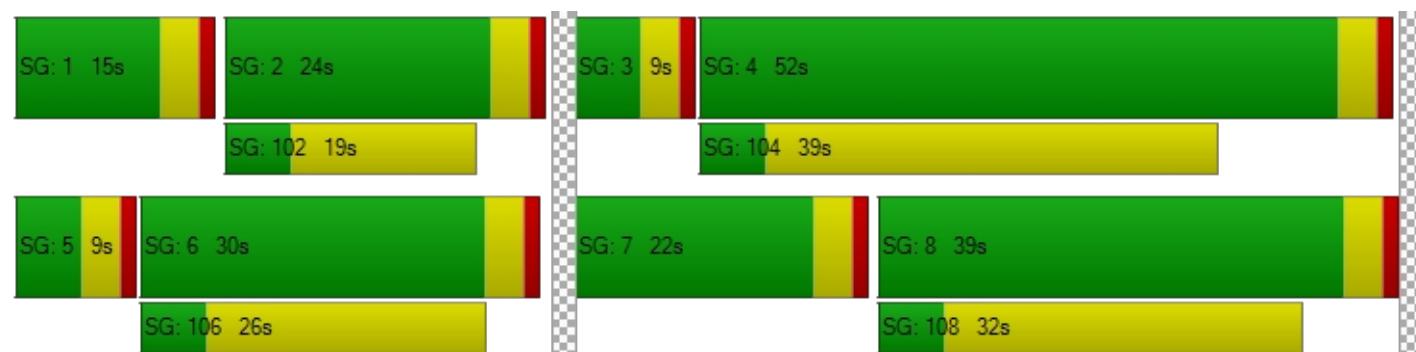
d_M, Delay for Movement [s/veh]	6.14	11.07	12.02	49.89	10.32	8.47	29.32	43.62	43.90	49.28	34.72	48.98
Movement LOS	A	B	B	D	B	A	C	D	D	D	C	D
d_A, Approach Delay [s/veh]	10.96			13.47			42.47			47.94		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	19.36											
Intersection LOS	B											
Intersection V/C	0.421											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.42			41.42			41.42			41.42		
I_p,int, Pedestrian LOS Score for Intersection	3.528			3.234			2.482			2.985		
Crosswalk LOS	D			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	520			400			700			960		
d_b, Bicycle Delay [s]	27.40			32.02			21.14			13.53		
I_b,int, Bicycle LOS Score for Intersection	2.552			2.046			2.126			2.586		
Bicycle LOS	B			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Signal Warrants Report For Intersection 17: 42nd Avenue/Fultondale Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	169	74	0	153
2	164	72	0	148
3	161	70	0	145
4	150	66	0	136
5	134	58	0	121
6	132	58	0	119
7	130	57	0	118
8	118	52	0	107
9	117	51	0	106
10	115	50	0	104
11	100	44	0	90
12	93	41	0	84
13	91	40	0	83
14	68	30	0	61
15	68	30	0	61
16	47	21	0	43
17	27	12	0	24
18	27	12	0	24
19	15	7	0	14
20	8	4	0	8
21	5	2	0	5
22	2	1	0	2
23	2	1	0	2
24	2	1	0	2



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	243	3	153	No	No	No	No	No	No	No	No	No	No
2	2	236	3	148	No	No	No	No	No	No	No	No	No	No
3	2	231	3	145	No	No	No	No	No	No	No	No	No	No
4	2	216	3	136	No	No	No	No	No	No	No	No	No	No
5	2	192	3	121	No	No	No	No	No	No	No	No	No	No
6	2	190	3	119	No	No	No	No	No	No	No	No	No	No
7	2	187	3	118	No	No	No	No	No	No	No	No	No	No
8	2	170	3	107	No	No	No	No	No	No	No	No	No	No
9	2	168	3	106	No	No	No	No	No	No	No	No	No	No
10	2	165	3	104	No	No	No	No	No	No	No	No	No	No
11	2	144	3	90	No	No	No	No	No	No	No	No	No	No
12	2	134	3	84	No	No	No	No	No	No	No	No	No	No
13	2	131	3	83	No	No	No	No	No	No	No	No	No	No
14	2	98	3	61	No	No	No	No	No	No	No	No	No	No
15	2	98	3	61	No	No	No	No	No	No	No	No	No	No
16	2	68	3	43	No	No	No	No	No	No	No	No	No	No
17	2	39	3	24	No	No	No	No	No	No	No	No	No	No
18	2	39	3	24	No	No	No	No	No	No	No	No	No	No
19	2	22	3	14	No	No	No	No	No	No	No	No	No	No
20	2	12	3	8	No	No	No	No	No	No	No	No	No	No
21	2	7	3	5	No	No	No	No	No	No	No	No	No	No
22	2	3	3	2	No	No	No	No	No	No	No	No	No	No
23	2	3	3	2	No	No	No	No	No	No	No	No	No	No
24	2	3	3	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.2	10.3
Number of Lanes on Minor Street Approach	2	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	0:26
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	153
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	396	396
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 23: 42nd Ave/PA 13.1 Access 2

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	169	124	0	0
2	164	120	0	0
3	161	118	0	0
4	150	110	0	0
5	134	98	0	0
6	132	97	0	0
7	130	95	0	0
8	118	87	0	0
9	117	86	0	0
10	115	84	0	0
11	100	73	0	0
12	93	68	0	0
13	91	67	0	0
14	68	50	0	0
15	68	50	0	0
16	47	35	0	0
17	27	20	0	0
18	27	20	0	0
19	15	11	0	0
20	8	6	0	0
21	5	4	0	0
22	2	1	0	0
23	2	1	0	0
24	2	1	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	293	1	0	No	No	No	No	No	No	No	No	No	No
2	2	284	1	0	No	No	No	No	No	No	No	No	No	No
3	2	279	1	0	No	No	No	No	No	No	No	No	No	No
4	2	260	1	0	No	No	No	No	No	No	No	No	No	No
5	2	232	1	0	No	No	No	No	No	No	No	No	No	No
6	2	229	1	0	No	No	No	No	No	No	No	No	No	No
7	2	225	1	0	No	No	No	No	No	No	No	No	No	No
8	2	205	1	0	No	No	No	No	No	No	No	No	No	No
9	2	203	1	0	No	No	No	No	No	No	No	No	No	No
10	2	199	1	0	No	No	No	No	No	No	No	No	No	No
11	2	173	1	0	No	No	No	No	No	No	No	No	No	No
12	2	161	1	0	No	No	No	No	No	No	No	No	No	No
13	2	158	1	0	No	No	No	No	No	No	No	No	No	No
14	2	118	1	0	No	No	No	No	No	No	No	No	No	No
15	2	118	1	0	No	No	No	No	No	No	No	No	No	No
16	2	82	1	0	No	No	No	No	No	No	No	No	No	No
17	2	47	1	0	No	No	No	No	No	No	No	No	No	No
18	2	47	1	0	No	No	No	No	No	No	No	No	No	No
19	2	26	1	0	No	No	No	No	No	No	No	No	No	No
20	2	14	1	0	No	No	No	No	No	No	No	No	No	No
21	2	9	1	0	No	No	No	No	No	No	No	No	No	No
22	2	3	1	0	No	No	No	No	No	No	No	No	No	No
23	2	3	1	0	No	No	No	No	No	No	No	No	No	No
24	2	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.2	10.3
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	293	293
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 24: 48th Ave/Road D

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	471	1109	20
2	457	1076	19
3	447	1054	19
4	419	987	18
5	372	876	16
6	367	865	16
7	363	854	15
8	330	776	14
9	325	765	14
10	320	754	14
11	278	654	12
12	259	610	11
13	254	599	11
14	188	444	8
15	188	444	8
16	132	311	6
17	75	177	3
18	75	177	3
19	42	100	2
20	24	55	1
21	14	33	1
22	5	11	0
23	5	11	0
24	5	11	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	1580	1	20	No	No	No	No	No	No	No	No	No	No
2	3	1533	1	19	No	No	No	No	No	No	No	No	No	No
3	3	1501	1	19	No	No	No	No	No	No	No	No	No	No
4	3	1406	1	18	No	No	No	No	No	No	No	No	No	No
5	3	1248	1	16	No	No	No	No	No	No	No	No	No	No
6	3	1232	1	16	No	No	No	No	No	No	No	No	No	No
7	3	1217	1	15	No	No	No	No	No	No	No	No	No	No
8	3	1106	1	14	No	No	No	No	No	No	No	No	No	No
9	3	1090	1	14	No	No	No	No	No	No	No	No	No	No
10	3	1074	1	14	No	No	No	No	No	No	No	No	No	No
11	3	932	1	12	No	No	No	No	No	No	No	No	No	No
12	3	869	1	11	No	No	No	No	No	No	No	No	No	No
13	3	853	1	11	No	No	No	No	No	No	No	No	No	No
14	3	632	1	8	No	No	No	No	No	No	No	No	No	No
15	3	632	1	8	No	No	No	No	No	No	No	No	No	No
16	3	443	1	6	No	No	No	No	No	No	No	No	No	No
17	3	252	1	3	No	No	No	No	No	No	No	No	No	No
18	3	252	1	3	No	No	No	No	No	No	No	No	No	No
19	3	142	1	2	No	No	No	No	No	No	No	No	No	No
20	3	79	1	1	No	No	No	No	No	No	No	No	No	No
21	3	47	1	1	No	No	No	No	No	No	No	No	No	No
22	3	16	1	0	No	No	No	No	No	No	No	No	No	No
23	3	16	1	0	No	No	No	No	No	No	No	No	No	No
24	3	16	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	13.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:04
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	20
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1600
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 25: 48th Avenue/PA-31 Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	393	483	168
2	381	469	163
3	373	459	160
4	350	430	150
5	310	382	133
6	307	377	131
7	303	372	129
8	275	338	118
9	271	333	116
10	267	328	114
11	232	285	99
12	216	266	92
13	212	261	91
14	157	193	67
15	157	193	67
16	110	135	47
17	63	77	27
18	63	77	27
19	35	43	15
20	20	24	8
21	12	14	5
22	4	5	2
23	4	5	2
24	4	5	2



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	876	2	168	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
2	3	850	2	163	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
3	3	832	2	160	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
4	3	780	2	150	No	No	Yes	Yes	No	Yes	Yes	Yes	No	No
5	3	692	2	133	No	No	No	Yes	No	No	Yes	Yes	No	No
6	3	684	2	131	No	No	No	Yes	No	No	Yes	Yes	No	No
7	3	675	2	129	No	No	No	Yes	No	No	Yes	Yes	No	No
8	3	613	2	118	No	No	No	Yes	No	No	No	Yes	No	No
9	3	604	2	116	No	No	No	Yes	No	No	No	Yes	No	No
10	3	595	2	114	No	No	No	Yes	No	No	No	Yes	No	No
11	3	517	2	99	No	No	No	No	No	No	No	Yes	No	No
12	3	482	2	92	No	No	No	No	No	No	No	No	No	No
13	3	473	2	91	No	No	No	No	No	No	No	No	No	No
14	3	350	2	67	No	No	No	No	No	No	No	No	No	No
15	3	350	2	67	No	No	No	No	No	No	No	No	No	No
16	3	245	2	47	No	No	No	No	No	No	No	No	No	No
17	3	140	2	27	No	No	No	No	No	No	No	No	No	No
18	3	140	2	27	No	No	No	No	No	No	No	No	No	No
19	3	78	2	15	No	No	No	No	No	No	No	No	No	No
20	3	44	2	8	No	No	No	No	No	No	No	No	No	No
21	3	26	2	5	No	No	No	No	No	No	No	No	No	No
22	3	9	2	2	No	No	No	No	No	No	No	No	No	No
23	3	9	2	2	No	No	No	No	No	No	No	No	No	No
24	3	9	2	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	3	4	10	0	4	7	11	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	13.5
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:37
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	168
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1044
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 26: Reserve Loop/PA-31 Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	6	192	28
2	6	186	27
3	6	182	27
4	5	171	25
5	5	152	22
6	5	150	22
7	5	148	22
8	4	134	20
9	4	132	19
10	4	131	19
11	4	113	17
12	3	106	15
13	3	104	15
14	2	77	11
15	2	77	11
16	2	54	8
17	1	31	4
18	1	31	4
19	1	17	3
20	0	10	1
21	0	6	1
22	0	2	0
23	0	2	0
24	0	2	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	198	2	28	No	No	No	No	No	No	No	No	No	No
2	2	192	2	27	No	No	No	No	No	No	No	No	No	No
3	2	188	2	27	No	No	No	No	No	No	No	No	No	No
4	2	176	2	25	No	No	No	No	No	No	No	No	No	No
5	2	157	2	22	No	No	No	No	No	No	No	No	No	No
6	2	155	2	22	No	No	No	No	No	No	No	No	No	No
7	2	153	2	22	No	No	No	No	No	No	No	No	No	No
8	2	138	2	20	No	No	No	No	No	No	No	No	No	No
9	2	136	2	19	No	No	No	No	No	No	No	No	No	No
10	2	135	2	19	No	No	No	No	No	No	No	No	No	No
11	2	117	2	17	No	No	No	No	No	No	No	No	No	No
12	2	109	2	15	No	No	No	No	No	No	No	No	No	No
13	2	107	2	15	No	No	No	No	No	No	No	No	No	No
14	2	79	2	11	No	No	No	No	No	No	No	No	No	No
15	2	79	2	11	No	No	No	No	No	No	No	No	No	No
16	2	56	2	8	No	No	No	No	No	No	No	No	No	No
17	2	32	2	4	No	No	No	No	No	No	No	No	No	No
18	2	32	2	4	No	No	No	No	No	No	No	No	No	No
19	2	18	2	3	No	No	No	No	No	No	No	No	No	No
20	2	10	2	1	No	No	No	No	No	No	No	No	No	No
21	2	6	2	1	No	No	No	No	No	No	No	No	No	No
22	2	2	2	0	No	No	No	No	No	No	No	No	No	No
23	2	2	2	0	No	No	No	No	No	No	No	No	No	No
24	2	2	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.4
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:03
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	28
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	226
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 27: Reserve Loop/Road C

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	34	193	12
2	33	187	12
3	32	183	11
4	30	172	11
5	27	152	9
6	27	151	9
7	26	149	9
8	24	135	8
9	23	133	8
10	23	131	8
11	20	114	7
12	19	106	7
13	18	104	6
14	14	77	5
15	14	77	5
16	10	54	3
17	5	31	2
18	5	31	2
19	3	17	1
20	2	10	1
21	1	6	0
22	0	2	0
23	0	2	0
24	0	2	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	227	1	12	No	No	No	No	No	No	No	No	No	No
2	1	220	1	12	No	No	No	No	No	No	No	No	No	No
3	1	215	1	11	No	No	No	No	No	No	No	No	No	No
4	1	202	1	11	No	No	No	No	No	No	No	No	No	No
5	1	179	1	9	No	No	No	No	No	No	No	No	No	No
6	1	178	1	9	No	No	No	No	No	No	No	No	No	No
7	1	175	1	9	No	No	No	No	No	No	No	No	No	No
8	1	159	1	8	No	No	No	No	No	No	No	No	No	No
9	1	156	1	8	No	No	No	No	No	No	No	No	No	No
10	1	154	1	8	No	No	No	No	No	No	No	No	No	No
11	1	134	1	7	No	No	No	No	No	No	No	No	No	No
12	1	125	1	7	No	No	No	No	No	No	No	No	No	No
13	1	122	1	6	No	No	No	No	No	No	No	No	No	No
14	1	91	1	5	No	No	No	No	No	No	No	No	No	No
15	1	91	1	5	No	No	No	No	No	No	No	No	No	No
16	1	64	1	3	No	No	No	No	No	No	No	No	No	No
17	1	36	1	2	No	No	No	No	No	No	No	No	No	No
18	1	36	1	2	No	No	No	No	No	No	No	No	No	No
19	1	20	1	1	No	No	No	No	No	No	No	No	No	No
20	1	12	1	1	No	No	No	No	No	No	No	No	No	No
21	1	7	1	0	No	No	No	No	No	No	No	No	No	No
22	1	2	1	0	No	No	No	No	No	No	No	No	No	No
23	1	2	1	0	No	No	No	No	No	No	No	No	No	No
24	1	2	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:01
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	12
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	239
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 28: Reserve Loop/Road B

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	47	133	71	43
2	46	129	69	42
3	45	126	67	41
4	42	118	63	38
5	37	105	56	34
6	37	104	55	34
7	36	102	55	33
8	33	93	50	30
9	32	92	49	30
10	32	90	48	29
11	28	78	42	25
12	26	73	39	24
13	25	72	38	23
14	19	53	28	17
15	19	53	28	17
16	13	37	20	12
17	8	21	11	7
18	8	21	11	7
19	4	12	6	4
20	2	7	4	2
21	1	4	2	1
22	0	1	1	0
23	0	1	1	0
24	0	1	1	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	180	2	71	No	No	No	No	No	No	No	No	No	No
2	2	175	2	69	No	No	No	No	No	No	No	No	No	No
3	2	171	2	67	No	No	No	No	No	No	No	No	No	No
4	2	160	2	63	No	No	No	No	No	No	No	No	No	No
5	2	142	2	56	No	No	No	No	No	No	No	No	No	No
6	2	141	2	55	No	No	No	No	No	No	No	No	No	No
7	2	138	2	55	No	No	No	No	No	No	No	No	No	No
8	2	126	2	50	No	No	No	No	No	No	No	No	No	No
9	2	124	2	49	No	No	No	No	No	No	No	No	No	No
10	2	122	2	48	No	No	No	No	No	No	No	No	No	No
11	2	106	2	42	No	No	No	No	No	No	No	No	No	No
12	2	99	2	39	No	No	No	No	No	No	No	No	No	No
13	2	97	2	38	No	No	No	No	No	No	No	No	No	No
14	2	72	2	28	No	No	No	No	No	No	No	No	No	No
15	2	72	2	28	No	No	No	No	No	No	No	No	No	No
16	2	50	2	20	No	No	No	No	No	No	No	No	No	No
17	2	29	2	11	No	No	No	No	No	No	No	No	No	No
18	2	29	2	11	No	No	No	No	No	No	No	No	No	No
19	2	16	2	6	No	No	No	No	No	No	No	No	No	No
20	2	9	2	4	No	No	No	No	No	No	No	No	No	No
21	2	5	2	2	No	No	No	No	No	No	No	No	No	No
22	2	1	2	1	No	No	No	No	No	No	No	No	No	No
23	2	1	2	1	No	No	No	No	No	No	No	No	No	No
24	2	1	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.5	9.9
Number of Lanes on Minor Street Approach	2	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:11	0:07
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	71	43
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	294	294
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 29: Reserve Loop/Road A

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	56	147	32	61
2	54	143	31	59
3	53	140	30	58
4	50	131	28	54
5	44	116	25	48
6	44	115	25	48
7	43	113	25	47
8	39	103	22	43
9	39	101	22	42
10	38	100	22	41
11	33	87	19	36
12	31	81	18	34
13	30	79	17	33
14	22	59	13	24
15	22	59	13	24
16	16	41	9	17
17	9	24	5	10
18	9	24	5	10
19	5	13	3	5
20	3	7	2	3
21	2	4	1	2
22	1	1	0	1
23	1	1	0	1
24	1	1	0	1



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	203	1	61	No	No	No	No	No	No	No	No	No	No
2	2	197	1	59	No	No	No	No	No	No	No	No	No	No
3	2	193	1	58	No	No	No	No	No	No	No	No	No	No
4	2	181	1	54	No	No	No	No	No	No	No	No	No	No
5	2	160	1	48	No	No	No	No	No	No	No	No	No	No
6	2	159	1	48	No	No	No	No	No	No	No	No	No	No
7	2	156	1	47	No	No	No	No	No	No	No	No	No	No
8	2	142	1	43	No	No	No	No	No	No	No	No	No	No
9	2	140	1	42	No	No	No	No	No	No	No	No	No	No
10	2	138	1	41	No	No	No	No	No	No	No	No	No	No
11	2	120	1	36	No	No	No	No	No	No	No	No	No	No
12	2	112	1	34	No	No	No	No	No	No	No	No	No	No
13	2	109	1	33	No	No	No	No	No	No	No	No	No	No
14	2	81	1	24	No	No	No	No	No	No	No	No	No	No
15	2	81	1	24	No	No	No	No	No	No	No	No	No	No
16	2	57	1	17	No	No	No	No	No	No	No	No	No	No
17	2	33	1	10	No	No	No	No	No	No	No	No	No	No
18	2	33	1	10	No	No	No	No	No	No	No	No	No	No
19	2	18	1	5	No	No	No	No	No	No	No	No	No	No
20	2	10	1	3	No	No	No	No	No	No	No	No	No	No
21	2	6	1	2	No	No	No	No	No	No	No	No	No	No
22	2	2	1	1	No	No	No	No	No	No	No	No	No	No
23	2	2	1	1	No	No	No	No	No	No	No	No	No	No
24	2	2	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.9	9.2
Number of Lanes on Minor Street Approach	2	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:05	0:09
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	32	61
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	296	296
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 40: 38th Parkway/Reserve Loop (W)

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	16	22	91
2	16	21	88
3	15	21	86
4	14	20	81
5	13	17	72
6	12	17	71
7	12	17	70
8	11	15	64
9	11	15	63
10	11	15	62
11	9	13	54
12	9	12	50
13	9	12	49
14	6	9	36
15	6	9	36
16	4	6	25
17	3	4	15
18	3	4	15
19	1	2	8
20	1	1	5
21	0	1	3
22	0	0	1
23	0	0	1
24	0	0	1



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	38	1	91	No	No	No	No	No	No	No	No	No	No
2	2	37	1	88	No	No	No	No	No	No	No	No	No	No
3	2	36	1	86	No	No	No	No	No	No	No	No	No	No
4	2	34	1	81	No	No	No	No	No	No	No	No	No	No
5	2	30	1	72	No	No	No	No	No	No	No	No	No	No
6	2	29	1	71	No	No	No	No	No	No	No	No	No	No
7	2	29	1	70	No	No	No	No	No	No	No	No	No	No
8	2	26	1	64	No	No	No	No	No	No	No	No	No	No
9	2	26	1	63	No	No	No	No	No	No	No	No	No	No
10	2	26	1	62	No	No	No	No	No	No	No	No	No	No
11	2	22	1	54	No	No	No	No	No	No	No	No	No	No
12	2	21	1	50	No	No	No	No	No	No	No	No	No	No
13	2	21	1	49	No	No	No	No	No	No	No	No	No	No
14	2	15	1	36	No	No	No	No	No	No	No	No	No	No
15	2	15	1	36	No	No	No	No	No	No	No	No	No	No
16	2	10	1	25	No	No	No	No	No	No	No	No	No	No
17	2	7	1	15	No	No	No	No	No	No	No	No	No	No
18	2	7	1	15	No	No	No	No	No	No	No	No	No	No
19	2	3	1	8	No	No	No	No	No	No	No	No	No	No
20	2	2	1	5	No	No	No	No	No	No	No	No	No	No
21	2	1	1	3	No	No	No	No	No	No	No	No	No	No
22	2	0	1	1	No	No	No	No	No	No	No	No	No	No
23	2	0	1	1	No	No	No	No	No	No	No	No	No	No
24	2	0	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:13
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	91
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	129
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 41: 38th Parkway/Road E

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	57	21	0
2	55	20	0
3	54	20	0
4	51	19	0
5	45	17	0
6	44	16	0
7	44	16	0
8	40	15	0
9	39	14	0
10	39	14	0
11	34	12	0
12	31	12	0
13	31	11	0
14	23	8	0
15	23	8	0
16	16	6	0
17	9	3	0
18	9	3	0
19	5	2	0
20	3	1	0
21	2	1	0
22	1	0	0
23	1	0	0
24	1	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	78	1	0	No	No	No	No	No	No	No	No	No	No
2	2	75	1	0	No	No	No	No	No	No	No	No	No	No
3	2	74	1	0	No	No	No	No	No	No	No	No	No	No
4	2	70	1	0	No	No	No	No	No	No	No	No	No	No
5	2	62	1	0	No	No	No	No	No	No	No	No	No	No
6	2	60	1	0	No	No	No	No	No	No	No	No	No	No
7	2	60	1	0	No	No	No	No	No	No	No	No	No	No
8	2	55	1	0	No	No	No	No	No	No	No	No	No	No
9	2	53	1	0	No	No	No	No	No	No	No	No	No	No
10	2	53	1	0	No	No	No	No	No	No	No	No	No	No
11	2	46	1	0	No	No	No	No	No	No	No	No	No	No
12	2	43	1	0	No	No	No	No	No	No	No	No	No	No
13	2	42	1	0	No	No	No	No	No	No	No	No	No	No
14	2	31	1	0	No	No	No	No	No	No	No	No	No	No
15	2	31	1	0	No	No	No	No	No	No	No	No	No	No
16	2	22	1	0	No	No	No	No	No	No	No	No	No	No
17	2	12	1	0	No	No	No	No	No	No	No	No	No	No
18	2	12	1	0	No	No	No	No	No	No	No	No	No	No
19	2	7	1	0	No	No	No	No	No	No	No	No	No	No
20	2	4	1	0	No	No	No	No	No	No	No	No	No	No
21	2	3	1	0	No	No	No	No	No	No	No	No	No	No
22	2	1	1	0	No	No	No	No	No	No	No	No	No	No
23	2	1	1	0	No	No	No	No	No	No	No	No	No	No
24	2	1	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	0
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	78
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 42: The Aurora Highlands Parkway/38th Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	E
1	48	0	21
2	47	0	20
3	46	0	20
4	43	0	19
5	38	0	17
6	37	0	16
7	37	0	16
8	34	0	15
9	33	0	14
10	33	0	14
11	28	0	12
12	26	0	12
13	26	0	11
14	19	0	8
15	19	0	8
16	13	0	6
17	8	0	3
18	8	0	3
19	4	0	2
20	2	0	1
21	1	0	1
22	0	0	0
23	0	0	0
24	0	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	48	3	21	No	No	No	No	No	No	No	No	No	No
2	2	47	3	20	No	No	No	No	No	No	No	No	No	No
3	2	46	3	20	No	No	No	No	No	No	No	No	No	No
4	2	43	3	19	No	No	No	No	No	No	No	No	No	No
5	2	38	3	17	No	No	No	No	No	No	No	No	No	No
6	2	37	3	16	No	No	No	No	No	No	No	No	No	No
7	2	37	3	16	No	No	No	No	No	No	No	No	No	No
8	2	34	3	15	No	No	No	No	No	No	No	No	No	No
9	2	33	3	14	No	No	No	No	No	No	No	No	No	No
10	2	33	3	14	No	No	No	No	No	No	No	No	No	No
11	2	28	3	12	No	No	No	No	No	No	No	No	No	No
12	2	26	3	12	No	No	No	No	No	No	No	No	No	No
13	2	26	3	11	No	No	No	No	No	No	No	No	No	No
14	2	19	3	8	No	No	No	No	No	No	No	No	No	No
15	2	19	3	8	No	No	No	No	No	No	No	No	No	No
16	2	13	3	6	No	No	No	No	No	No	No	No	No	No
17	2	8	3	3	No	No	No	No	No	No	No	No	No	No
18	2	8	3	3	No	No	No	No	No	No	No	No	No	No
19	2	4	3	2	No	No	No	No	No	No	No	No	No	No
20	2	2	3	1	No	No	No	No	No	No	No	No	No	No
21	2	1	3	1	No	No	No	No	No	No	No	No	No	No
22	2	0	3	0	No	No	No	No	No	No	No	No	No	No
23	2	0	3	0	No	No	No	No	No	No	No	No	No	No
24	2	0	3	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.4
Number of Lanes on Minor Street Approach	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	21
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	69
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 43: The Aurora Highlands Parkway/38th Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets	Minor Streets
	W	N
1	0	48
2	0	47
3	0	46
4	0	43
5	0	38
6	0	37
7	0	37
8	0	34
9	0	33
10	0	33
11	0	28
12	0	26
13	0	26
14	0	19
15	0	19
16	0	13
17	0	8
18	0	8
19	0	4
20	0	2
21	0	1
22	0	0
23	0	0
24	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	0	1	48	No	No	No	No	No	No	No	No	No	No
2	2	0	1	47	No	No	No	No	No	No	No	No	No	No
3	2	0	1	46	No	No	No	No	No	No	No	No	No	No
4	2	0	1	43	No	No	No	No	No	No	No	No	No	No
5	2	0	1	38	No	No	No	No	No	No	No	No	No	No
6	2	0	1	37	No	No	No	No	No	No	No	No	No	No
7	2	0	1	37	No	No	No	No	No	No	No	No	No	No
8	2	0	1	34	No	No	No	No	No	No	No	No	No	No
9	2	0	1	33	No	No	No	No	No	No	No	No	No	No
10	2	0	1	33	No	No	No	No	No	No	No	No	No	No
11	2	0	1	28	No	No	No	No	No	No	No	No	No	No
12	2	0	1	26	No	No	No	No	No	No	No	No	No	No
13	2	0	1	26	No	No	No	No	No	No	No	No	No	No
14	2	0	1	19	No	No	No	No	No	No	No	No	No	No
15	2	0	1	19	No	No	No	No	No	No	No	No	No	No
16	2	0	1	13	No	No	No	No	No	No	No	No	No	No
17	2	0	1	8	No	No	No	No	No	No	No	No	No	No
18	2	0	1	8	No	No	No	No	No	No	No	No	No	No
19	2	0	1	4	No	No	No	No	No	No	No	No	No	No
20	2	0	1	2	No	No	No	No	No	No	No	No	No	No
21	2	0	1	1	No	No	No	No	No	No	No	No	No	No
22	2	0	1	0	No	No	No	No	No	No	No	No	No	No
23	2	0	1	0	No	No	No	No	No	No	No	No	No	No
24	2	0	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:06
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	48
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	48
Number of Approaches on Intersection	2
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Intersection Level Of Service Report
Intersection 1: 48th Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	39.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.318

Intersection Setup

Name	Main Street			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound		
Lane Configuration	L			L			L		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	2	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	325.0	100.0	400.0	250.0	100.0	250.0	300.0	100.0	400.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.0
Speed [mph]	30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00		
Curb Present	No			No			No		
Crosswalk	Yes			Yes			Yes		

**Volumes**

Name	Main Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	75	7	86	104	7	40	166	642	158	114	754	182
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	6	0	0	0	0	90	6	4	45	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	46	0	0	40	0	0	82	0	0	91
Total Hourly Volume [veh/h]	87	7	46	104	7	0	166	732	82	118	799	91
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	24	2	13	28	2	0	45	199	22	32	217	25
Total Analysis Volume [veh/h]	95	8	50	113	8	0	180	796	89	128	868	99
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	43	0	15	43	0	12	32	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	34	0	0	34	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	49	49	5	50	50	8	24	24	6	22	22
g / C, Green / Cycle	0.05	0.49	0.49	0.05	0.50	0.50	0.08	0.24	0.24	0.06	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.03	0.00	0.03	0.04	0.00	0.00	0.06	0.17	0.06	0.04	0.19	0.07
s, saturation flow rate [veh/h]	3113	1683	1431	3113	1683	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	150	821	698	172	833	708	241	1087	339	186	1006	314
d1, Uniform Delay [s]	46.78	13.18	13.60	46.37	12.83	0.00	45.25	35.26	31.07	46.17	37.62	32.77
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering 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
d2, Incremental Delay [s]	4.32	0.02	0.20	4.21	0.02	0.00	4.61	0.97	0.41	4.50	2.33	0.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.63	0.01	0.07	0.66	0.01	0.00	0.75	0.73	0.26	0.69	0.86	0.32
d, Delay for Lane Group [s/veh]	51.10	13.20	13.79	50.58	12.85	0.00	49.86	36.23	31.48	50.67	39.96	33.33
Lane Group LOS	D	B	B	D	B	A	D	D	C	D	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.25	0.10	0.63	1.47	0.09	0.00	2.33	5.97	1.78	1.67	6.93	2.05
50th-Percentile Queue Length [ft/ln]	31.14	2.40	15.65	36.80	2.36	0.00	58.25	149.3	44.39	41.73	173.1	51.22
95th-Percentile Queue Length [veh/ln]	2.24	0.17	1.13	2.65	0.17	0.00	4.19	9.98	3.20	3.00	11.24	3.69
95th-Percentile Queue Length [ft/ln]	56.06	4.32	28.17	66.24	4.25	0.00	104.8	249.5	79.90	75.11	281.0	92.19

**Movement, Approach, & Intersection Results**

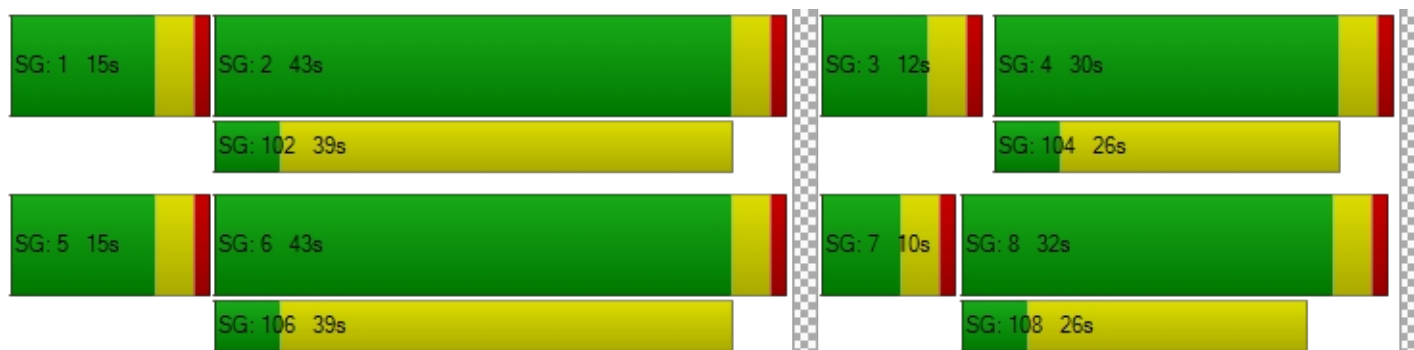
d_M, Delay for Movement [s/veh]	51.10	13.20	13.79	50.58	12.85	0.00	49.86	36.23	31.48	50.67	39.96	33.33
Movement LOS	D	B	B	D	B	A	D	D	C	D	D	C
d_A, Approach Delay [s/veh]	36.92			48.09			38.13			40.61		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.67											
Intersection LOS	D											
Intersection V/C	0.318											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	2.607			2.604			3.299			3.223		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	779			779			560			520		
d_b, Bicycle Delay [s]	18.63			18.63			25.95			27.41		
I_b,int, Bicycle LOS Score for Intersection	1.888			1.825			2.190			2.212		
Bicycle LOS	A			A			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 5: 48th Avenue/Denali Boulevard

Control Type:	Signalized	Delay (sec / veh):	28.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.448

Intersection Setup

Name	Denali Boulevard			Denali Boulevard			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	3	0	1	1	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	350.0	100.0	250.0	350.0	100.0	300.0	250.0	100.0	450.0	400.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	0.00	0.00	300.0
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Denali Boulevard			Denali Boulevard			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	197	85	138	127	159	301	89	619	342	285	680	85
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	3	0	10	6	0	0	68	28	0	40	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	138	0	0	151	0	0	185	0	0	46
Total Hourly Volume [veh/h]	206	88	0	137	165	150	89	687	185	285	720	45
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	56	24	0	37	45	41	24	187	50	77	196	12
Total Analysis Volume [veh/h]	224	96	0	149	179	163	97	747	201	310	783	49
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	48	0	9	43	0	23	36	0	17	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	37	0	0	34	0	0	27	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	20	20	29	15	15	5	56	56	13	64	64
g / C, Green / Cycle	0.09	0.18	0.18	0.26	0.14	0.14	0.05	0.51	0.51	0.12	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.00	0.12	0.06	0.11	0.03	0.16	0.14	0.10	0.17	0.03
s, saturation flow rate [veh/h]	3113	3204	1431	1275	3204	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	279	586	262	405	448	200	151	2331	728	364	2644	825
d1, Uniform Delay [s]	49.17	37.88	0.00	33.11	43.16	45.99	51.43	15.88	15.47	47.69	11.89	10.21
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	5.36	0.13	0.00	0.56	0.58	7.87	4.47	0.36	0.94	5.69	0.29	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.80	0.16	0.00	0.37	0.40	0.82	0.64	0.32	0.28	0.85	0.30	0.06
d, Delay for Lane Group [s/veh]	54.53	38.01	0.00	33.67	43.73	53.86	55.91	16.25	16.41	53.38	12.18	10.35
Lane Group LOS	D	D	A	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.22	1.10	0.00	3.28	2.26	4.75	1.41	3.68	3.02	4.44	3.22	0.54
50th-Percentile Queue Length [ft/ln]	80.49	27.60	0.00	82.00	56.41	118.6	35.16	92.03	75.57	111.0	80.62	13.50
95th-Percentile Queue Length [veh/ln]	5.80	1.99	0.00	5.90	4.06	8.32	2.53	6.63	5.44	7.90	5.80	0.97
95th-Percentile Queue Length [ft/ln]	144.8	49.68	0.00	147.5	101.5	207.9	63.28	165.6	136.0	197.4	145.1	24.30

**Movement, Approach, & Intersection Results**

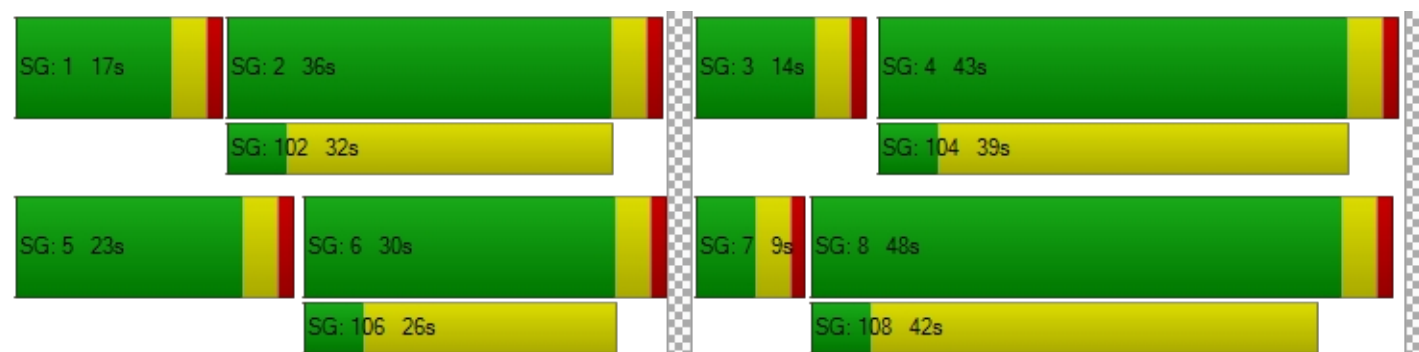
d_M, Delay for Movement [s/veh]	54.53	38.01	0.00	33.67	43.73	53.86	55.91	16.25	16.41	53.38	12.18	10.35
Movement LOS	D	D	A	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	49.57			44.04			19.96			23.28		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	28.33											
Intersection LOS	C											
Intersection V/C	0.448											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	46.39			46.39			46.39			46.39		
I_p,int, Pedestrian LOS Score for Intersection	2.987			2.830			3.400			3.302		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			709			582			473		
d_b, Bicycle Delay [s]	19.82			22.94			27.68			32.10		
I_b,int, Bicycle LOS Score for Intersection	1.937			2.089			2.236			2.213		
Bicycle LOS	A			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 12: 48th Avenue/Fultondale Street

Control Type:	Signalized	Delay (sec / veh):	11.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.237

Intersection Setup

Name	Fultondale Street						48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T			T T T T			T T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	2	0	1	1	0	0	1	0	1	2	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	150.0	100.0	100.0	40.00	100.0	100.0	175.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Fultondale Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	66	12	48	8	22	22	11	633	125	59	311	10
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	5	0	0	0	0	78	0	6	46	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	27	0	0	11	0	0	63	0	0	5
Total Hourly Volume [veh/h]	66	12	26	8	22	11	11	711	62	65	357	5
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	18	3	7	2	6	3	3	193	17	18	97	1
Total Analysis Volume [veh/h]	72	13	28	9	24	12	12	773	67	71	388	5
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	ProtP	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	10	39	0	9	32	0	9	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	21	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	9	9	14	6	68	60	60	4	62	62
g / C, Green / Cycle	0.05	0.10	0.10	0.16	0.07	0.75	0.66	0.66	0.05	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.02	0.01	0.02	0.01	0.02	0.01	0.17	0.05	0.02	0.08	0.08
s, saturation flow rate [veh/h]	3113	1683	1431	1311	1589	928	4584	1431	3113	3204	1672
c, Capacity [veh/h]	148	172	147	319	107	781	3027	944	148	2217	1157
d1, Uniform Delay [s]	41.87	36.61	37.05	32.04	40.13	2.85	6.26	5.46	41.87	4.66	4.66
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.45	0.18	0.63	0.04	1.83	0.04	0.20	0.15	2.42	0.11	0.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.08	0.19	0.03	0.34	0.02	0.26	0.07	0.48	0.12	0.12
d, Delay for Lane Group [s/veh]	44.32	36.79	37.68	32.08	41.95	2.89	6.47	5.61	44.29	4.77	4.87
Lane Group LOS	D	D	D	C	D	A	A	A	D	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.82	0.27	0.59	0.17	0.81	0.05	1.79	0.43	0.81	0.70	0.77
50th-Percentile Queue Length [ft/ln]	20.58	6.64	14.63	4.19	20.21	1.19	44.64	10.75	20.29	17.60	19.22
95th-Percentile Queue Length [veh/ln]	1.48	0.48	1.05	0.30	1.46	0.09	3.21	0.77	1.46	1.27	1.38
95th-Percentile Queue Length [ft/ln]	37.04	11.95	26.33	7.55	36.38	2.14	80.35	19.36	36.51	31.68	34.59

**Movement, Approach, & Intersection Results**

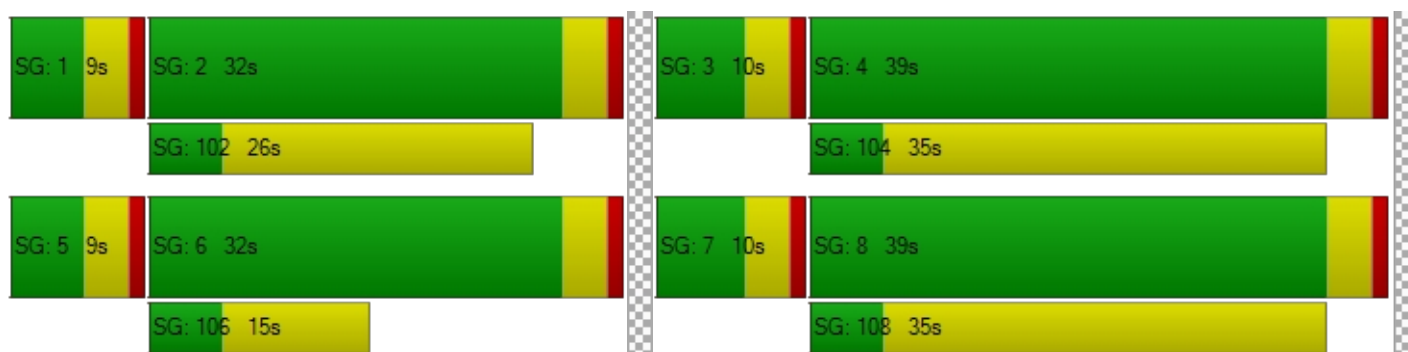
d_M, Delay for Movement [s/veh]	44.32	36.79	37.68	32.08	41.95	41.95	2.89	6.47	5.61	44.29	4.80	4.87
Movement LOS	D	D	D	C	D	D	A	A	A	D	A	A
d_A, Approach Delay [s/veh]	41.81			39.98			6.35			10.84		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	11.51											
Intersection LOS	B											
Intersection V/C	0.237											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.49			36.49			36.49			36.49		
I_p,int, Pedestrian LOS Score for Intersection	2.552			1.999			2.987			2.895		
Crosswalk LOS	B			A			C			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	777			777			622			622		
d_b, Bicycle Delay [s]	16.84			16.84			21.40			21.40		
I_b,int, Bicycle LOS Score for Intersection	1.791			1.652			2.063			1.818		
Bicycle LOS	A			A			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 16: 42nd Avenue/Denali Boulevard

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.158

Intersection Setup

Name	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	80	347	74	62	375	62	21	7	22	21	9	20
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	34	0	0	0	41	0	0	31	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	37	0	0	31	0	0	11	0	0	16
Total Hourly Volume [veh/h]	80	347	37	96	375	31	21	48	11	21	40	16
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	22	94	10	26	102	8	6	13	3	6	11	4
Total Analysis Volume [veh/h]	87	377	40	104	408	34	23	52	12	23	43	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	69	0	0	69	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	65	65	65	65	65	65	27	27	27	27	27	27
g / C, Green / Cycle	0.65	0.65	0.65	0.65	0.65	0.65	0.27	0.27	0.27	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.10	0.12	0.03	0.12	0.13	0.02	0.02	0.03	0.01	0.02	0.03	0.01
s, saturation flow rate [veh/h]	852	3204	1431	872	3204	1431	1208	1683	1431	1204	1683	1431
c, Capacity [veh/h]	566	2083	930	581	2083	930	351	454	386	345	454	386
d1, Uniform Delay [s]	9.87	6.94	6.30	9.86	7.02	6.27	30.15	27.49	26.87	30.48	27.34	26.97
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering 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
d2, Incremental Delay [s]	0.58	0.19	0.09	0.67	0.21	0.07	0.36	0.51	0.15	0.37	0.41	0.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.15	0.18	0.04	0.18	0.20	0.04	0.07	0.11	0.03	0.07	0.09	0.04
d, Delay for Lane Group [s/veh]	10.45	7.13	6.39	10.53	7.23	6.35	30.51	28.01	27.02	30.85	27.76	27.18
Lane Group LOS	B	A	A	B	A	A	C	C	C	C	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.94	1.52	0.30	1.13	1.66	0.26	0.47	1.00	0.23	0.47	0.82	0.32
50th-Percentile Queue Length [ft/ln]	23.61	37.90	7.60	28.37	41.48	6.43	11.71	24.95	5.66	11.79	20.49	8.06
95th-Percentile Queue Length [veh/ln]	1.70	2.73	0.55	2.04	2.99	0.46	0.84	1.80	0.41	0.85	1.48	0.58
95th-Percentile Queue Length [ft/ln]	42.50	68.22	13.67	51.07	74.67	11.57	21.08	44.90	10.19	21.23	36.89	14.50

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	10.45	7.13	6.39	10.53	7.23	6.35	30.51	28.01	27.02	30.85	27.76	27.18
Movement LOS	B	A	A	B	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	7.65			7.80			28.53			28.50		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	10.62											
Intersection LOS	B											
Intersection V/C	0.158											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.41			41.41			41.41			41.41		
I_p,int, Pedestrian LOS Score for Intersection	2.707			2.700			2.503			2.389		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1300			1300			540			540		
d_b, Bicycle Delay [s]	6.13			6.13			26.65			26.65		
I_b,int, Bicycle LOS Score for Intersection	2.006			2.036			1.721			1.723		
Bicycle LOS	B			B			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 17: 42nd Avenue/Fultondale Street

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.124

Intersection Setup

Name	Fultondale Street			Fultondale Street			42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Fultondale Street			Fultondale Street			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	0	0	69	12	69	32	6	11	4	78	18
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	2	0	1	2	73	0	0	42	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	71	12	70	34	79	11	4	120	21
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	19	3	19	9	21	3	1	33	6
Total Analysis Volume [veh/h]	0	0	0	77	13	76	37	86	12	4	130	23
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.12	0.02	0.08	0.03	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.94	11.27	8.73	11.64	11.36	9.34	7.59	0.00	0.00	7.41	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.42	0.07	0.27	0.08	0.00	0.00	0.01	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	10.59	1.72	6.85	1.99	0.00	0.00	0.20	0.00	0.00
d_A, Approach Delay [s/veh]	10.65			10.56			2.08			0.19		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.51											
Intersection LOS	B											



Intersection Level Of Service Report

Intersection 20: 42nd Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	9.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.100

Intersection Setup

Name	Main Street		Main Street		42nd Avenue	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Main Street		Main Street		42nd Avenue	
Base Volume Input [veh/h]	197	53	63	137	23	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	35	6	4	20	12
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	44	0	0	0	20
Total Hourly Volume [veh/h]	203	44	69	141	43	19
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	12	19	38	12	5
Total Analysis Volume [veh/h]	221	48	75	153	47	21
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	6	0	0	2	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	33	0	0	33	27	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	R
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	29	23	23
g / C, Green / Cycle	0.48	0.48	0.48	0.48	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.08	0.08	0.08	0.05	0.02	0.01
s, saturation flow rate [veh/h]	1683	1583	999	3204	3113	1431
c, Capacity [veh/h]	813	765	522	1549	1193	548
d1, Uniform Delay [s]	8.70	8.75	11.60	8.41	11.58	11.58
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.44	0.50	0.58	0.13	0.06	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.17	0.18	0.14	0.10	0.04	0.04
d, Delay for Lane Group [s/veh]	9.14	9.25	12.18	8.54	11.65	11.71
Lane Group LOS	A	A	B	A	B	B
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.94	0.95	0.66	0.49	0.19	0.18
50th-Percentile Queue Length [ft/ln]	23.40	23.71	16.45	12.19	4.67	4.44
95th-Percentile Queue Length [veh/ln]	1.69	1.71	1.18	0.88	0.34	0.32
95th-Percentile Queue Length [ft/ln]	42.13	42.67	29.61	21.94	8.40	7.99

**Movement, Approach, & Intersection Results**

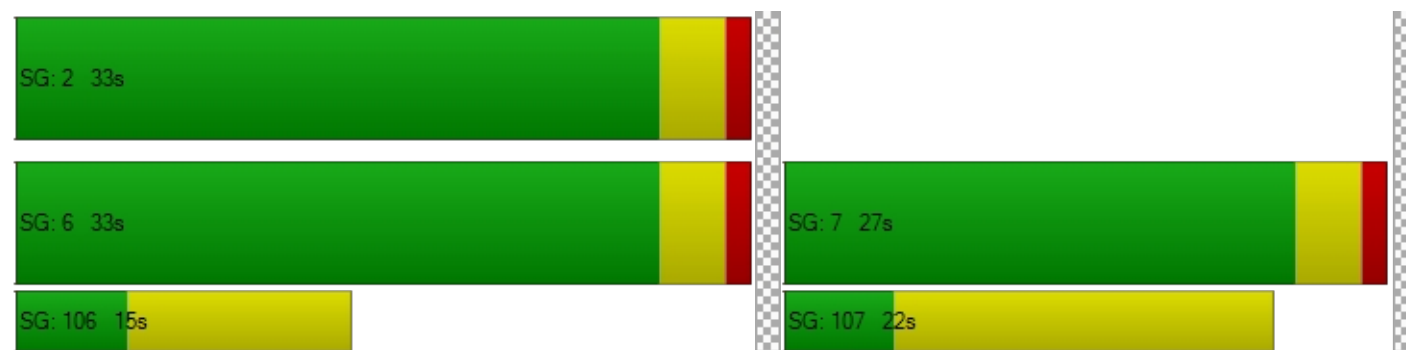
d_M, Delay for Movement [s/veh]	9.19	9.25	12.18	8.54	11.65	11.71
Movement LOS	A	A	B	A	B	B
d_A, Approach Delay [s/veh]	9.20		9.73		11.66	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	9.71					
Intersection LOS	A					
Intersection V/C	0.100					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.68	21.68	21.68
I_p,int, Pedestrian LOS Score for Intersection	2.299	2.376	2.309
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	767
d_b, Bicycle Delay [s]	8.01	8.01	11.41
I_b,int, Bicycle LOS Score for Intersection	1.818	1.748	1.560
Bicycle LOS	A	A	A

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 23: 42nd Ave/PA 13.1 Access 2

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 7.6
 Level Of Service: A
 Volume to Capacity (v/c): 0.004

Intersection Setup

Name							42nd Avenue			42nd Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+ +			+ +		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name							42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	0	0	0	0	0	6	91	3	5	89	5
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	74	0	0	44	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	0	0	6	165	3	5	133	5
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	0	2	45	1	1	36	1
Total Analysis Volume [veh/h]	0	0	0	0	0	0	7	179	3	5	145	5
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.02	11.36	9.18	11.02	11.35	9.00	7.53	0.00	0.00	7.59	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.27	0.00	0.00
d_A, Approach Delay [s/veh]	10.52			10.46			0.28			0.24		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	0.26											
Intersection LOS	A											



Intersection Level Of Service Report Intersection 24: 48th Ave/Road D

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 10.0
Level Of Service: B
Volume to Capacity (v/c): 0.021

Intersection Setup

Name			48th Avenue		48th Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			48th Avenue		48th Avenue	
Base Volume Input [veh/h]	0	0	445	0	0	370
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	14	52	31	20	35
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	14	497	31	20	405
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	4	135	8	5	110
Total Analysis Volume [veh/h]	20	15	540	34	22	440
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	10.05	0.00	0.00	0.00	0.00
Movement LOS		B	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.06	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	1.58	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.05		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.15					
Intersection LOS	B					



Intersection Level Of Service Report

Intersection 25: 48th Avenue/PA-31 Street

Control Type:	Two-way stop	Delay (sec / veh):	19.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.174

Intersection Setup

Name	PA-31 Street		48th Avenue		48th Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	1	0
Entry Pocket Length [ft]	200.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	PA-31 Street		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	20	73	445	0	0	370
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	30	22	15	51	38	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	95	460	51	38	395
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	26	125	14	10	107
Total Analysis Volume [veh/h]	54	103	500	55	41	429
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.17	0.14	0.01	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	18.99	10.56	0.00	0.00	8.71	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.62	0.47	0.00	0.00	0.13	0.00
95th-Percentile Queue Length [ft/ln]	15.46	11.87	0.00	0.00	3.17	0.00
d_A, Approach Delay [s/veh]	13.46		0.00		0.76	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.09					
Intersection LOS	C					



Intersection Level Of Service Report

Intersection 26: Reserve Loop/PA-31 Street

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	PA-31 Street		Reserve Loop		Reserve Loop	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	PA-31 Street		Reserve Loop		Reserve Loop	
Base Volume Input [veh/h]	0	0	93	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	88	52	20	34	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	88	145	20	34	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	24	39	5	9	0
Total Analysis Volume [veh/h]	2	96	158	22	37	0
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.41	8.83	7.54	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.31	0.33	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.27	7.65	8.36	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.89		6.62		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.55					
Intersection LOS	B					



Intersection Level Of Service Report Intersection 27: Reserve Loop/Road C

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 9.0
Level Of Service: A
Volume to Capacity (v/c): 0.014

Intersection Setup

Name			Reserve Loop		Reserve Loop	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			Reserve Loop		Reserve Loop	
Base Volume Input [veh/h]	0	0	0	93	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	24	71	122	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	12	24	164	122	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	3	7	45	33	0
Total Analysis Volume [veh/h]	0	13	26	178	133	0
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.83	8.99	7.51	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.04	0.04	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.08	1.08	1.10	1.10	0.00	0.00
d_A, Approach Delay [s/veh]	8.99		0.96		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.89					
Intersection LOS	A					



Intersection Level Of Service Report

Intersection 28: Reserve Loop/Road B

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 12.0
 Level Of Service: B
 Volume to Capacity (v/c): 0.043

Intersection Setup

Name	Reserve Loop			Reserve Loop								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Reserve Loop			Reserve Loop								
Base Volume Input [veh/h]	0	93	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	41	24	60	25	49	21	0	4	13	0	34
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	134	24	60	25	49	21	0	4	13	0	34
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	1	36	7	16	7	13	6	0	1	4	0	9
Total Analysis Volume [veh/h]	4	146	26	65	27	53	23	0	4	14	0	37
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.04	0.00	0.00	0.02	0.00	0.04
d_M, Delay for Movement [s/veh]	7.38	0.00	0.00	7.69	0.00	0.00	12.03	12.02	8.86	11.47	11.99	9.24
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.01	0.15	0.00	0.00	0.15	0.15	0.15	0.08	0.08	0.13
95th-Percentile Queue Length [ft/ln]	0.17	0.17	0.17	3.64	0.00	0.00	3.68	3.68	3.68	1.88	1.88	3.26
d_A, Approach Delay [s/veh]	0.17			3.45			11.56			9.85		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	3.37											
Intersection LOS	B											



Intersection Level Of Service Report Intersection 29: Reserve Loop/Road A

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 11.9
Level Of Service: B
Volume to Capacity (v/c): 0.042

Intersection Setup

Name	Reserve Loop			Reserve Loop								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Reserve Loop			Reserve Loop								
Base Volume Input [veh/h]	0	93	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	55	60	36	0	42	0	9	0	33	21	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	153	36	0	42	0	9	0	33	21	0	0
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	15	42	10	0	11	0	2	0	9	6	0	0
Total Analysis Volume [veh/h]	60	166	39	0	46	0	10	0	36	23	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.04	0.00	0.00
d_M, Delay for Movement [s/veh]	7.40	0.00	0.00	7.63	0.00	0.00	11.43	11.93	8.74	11.90	11.53	9.20
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.12	0.00	0.00	0.00	0.00	0.00	0.17	0.17	0.17	0.13	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.99	0.00	0.00	0.00	0.00	0.00	4.14	4.14	4.14	3.30	0.00	0.00
d_A, Approach Delay [s/veh]	1.67			0.00			9.33			11.90		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	3.02											
Intersection LOS	B											



Intersection Level Of Service Report
Intersection 30: 42nd Avenue/Reserve Loop

Control Type:	Signalized	Delay (sec / veh):	10.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.167

Intersection Setup

Name	Reserve Loop		Reserve Loop		42nd Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Reserve Loop		Reserve Loop		42nd Avenue	
Base Volume Input [veh/h]	89	57	47	49	36	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	90	59	37	61	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	43	0	37
Total Hourly Volume [veh/h]	97	147	106	43	97	37
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	40	29	12	26	10
Total Analysis Volume [veh/h]	105	160	115	47	105	40
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	0	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	10	10	0	5	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	33	33	0	27	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	5	5	0	5	0
Pedestrian Clearance [s]	0	10	10	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	R
C, Cycle Length [s]	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	23	23
g / C, Green / Cycle	0.48	0.48	0.48	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.10	0.10	0.10	0.07	0.03
s, saturation flow rate [veh/h]	1101	1683	1601	1603	1431
c, Capacity [veh/h]	552	813	774	614	548
d1, Uniform Delay [s]	12.27	8.85	8.91	12.21	11.74
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.77	0.54	0.61	0.60	0.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.19	0.20	0.21	0.17	0.07
d, Delay for Lane Group [s/veh]	13.03	9.39	9.52	12.81	11.99
Lane Group LOS	B	A	A	B	B
Critical Lane Group	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.96	1.13	1.16	0.93	0.34
50th-Percentile Queue Length [ft/ln]	23.98	28.37	29.11	23.34	8.59
95th-Percentile Queue Length [veh/ln]	1.73	2.04	2.10	1.68	0.62
95th-Percentile Queue Length [ft/ln]	43.16	51.07	52.40	42.01	15.46

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	13.03	9.39	9.52	9.52	12.81	11.99
Movement LOS	B	A	A	A	B	B
d_A, Approach Delay [s/veh]	10.83		9.52		12.59	
Approach LOS	B		A		B	
d_I, Intersection Delay [s/veh]	10.91					
Intersection LOS	B					
Intersection V/C	0.167					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.68	21.68	21.68
I_p,int, Pedestrian LOS Score for Intersection	2.069	1.986	2.245
Crosswalk LOS	B	A	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	767
d_b, Bicycle Delay [s]	8.01	8.01	11.41
I_b,int, Bicycle LOS Score for Intersection	1.997	1.898	1.560
Bicycle LOS	A	A	A

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 40: 38th Parkway/Reserve Loop (W)

Control Type:	Two-way stop	Delay (sec / veh):	9.8
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.035

Intersection Setup

Name	Reserve Loop		38th Parkway		38th Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Reserve Loop		38th Parkway		38th Parkway	
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	26	32	55	11	7	46
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	32	55	11	7	46
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	9	15	3	2	13
Total Analysis Volume [veh/h]	28	35	60	12	8	50
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.03	0.04	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.83	8.75	7.42	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.22	0.22	0.12	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	5.54	5.54	3.03	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.23		6.19		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	5.32					
Intersection LOS	A					



Intersection Level Of Service Report

Intersection 41: 38th Parkway/Road E

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 0.0
 Level Of Service: A
 Volume to Capacity (v/c): 0.001

Intersection Setup

Name			38th Parkway		38th Parkway	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			38th Parkway		38th Parkway	
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	66	0	0	38
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	66	0	0	38
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	18	0	0	10
Total Analysis Volume [veh/h]	0	0	72	0	0	41
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.07	8.64	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.85		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

**Intersection Level Of Service Report****Intersection 42: The Aurora Highlands Parkway/38th Parkway**

Control Type:	Two-way stop	Delay (sec / veh):	8.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name	38th Parkway			38th Parkway			Th Au			Th Au		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	38th Parkway			38th Parkway			Th Au			Th Au		
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	8	30	0	0	0	0	0	0	66
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	8	30	0	0	0	0	0	0	66
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	2	8	0	0	0	0	0	0	18
Total Analysis Volume [veh/h]	0	0	0	9	33	0	0	0	0	0	0	72
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance				No
Number of Storage Spaces in Median	0	0	0	0



Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
d_M, Delay for Movement [s/veh]	7.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.70	9.19	8.55
Movement LOS	A	A			A	A					A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.32
d_A, Approach Delay [s/veh]	3.64			0.00			0.00			8.55			
Approach LOS	A			A			A			A			
d_I, Intersection Delay [s/veh]	5.87												
Intersection LOS	A												

**Intersection Level Of Service Report****Intersection 43: The Aurora Highlands Parkway/38th Parkway**

Control Type:	Two-way stop	Delay (sec / veh):	8.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	38th Parkway		Th Au			
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	38th Parkway		Th Au			
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	30	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	0	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	0	0	0	0
Total Analysis Volume [veh/h]	33	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.64	0.00	0.00	0.00	0.00	0.00
Movement LOS	A		A	A		
95th-Percentile Queue Length [veh/ln]	0.10	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.50	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.64		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]			8.64			
Intersection LOS			A			



Intersection Level Of Service Report

Intersection 46: 48th Avenue/Harvest Road

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.420

Intersection Setup

Name	Harvest Road		48th Avenue		48th Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	3	0	0	1
Entry Pocket Length [ft]	450.00	200.00	400.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	2	0	1	0	1
Exit Pocket Length [ft]	0.00	174.61	0.00	400.00	0.00	49.21
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Harvest Road		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	517	263	427	623	195	213
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	6	3	67	43	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	269	0	0	0	223
Total Hourly Volume [veh/h]	534	0	430	690	238	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	145	0	117	188	65	0
Total Analysis Volume [veh/h]	580	0	467	750	259	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	7	0	5	2	6	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	5	0	5	10	10	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	46	0	28	64	36	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	37	0	0	10	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	19	78	56	56
g / C, Green / Cycle	0.21	0.21	0.17	0.71	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.19	0.00	0.15	0.23	0.08	0.00
s, saturation flow rate [veh/h]	3113	1431	3113	3204	3204	1431
c, Capacity [veh/h]	665	305	534	2287	1621	724
d1, Uniform Delay [s]	41.80	0.00	44.40	5.88	14.61	0.00
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.76	0.00	4.69	0.38	0.21	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.00	0.87	0.33	0.16	0.00
d, Delay for Lane Group [s/veh]	45.55	0.00	49.09	6.27	14.82	0.00
Lane Group LOS	D	A	D	A	B	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.88	0.00	6.51	2.99	1.77	0.00
50th-Percentile Queue Length [ft/ln]	197.04	0.00	162.72	74.83	44.22	0.00
95th-Percentile Queue Length [veh/ln]	12.49	0.00	10.69	5.39	3.18	0.00
95th-Percentile Queue Length [ft/ln]	312.15	0.00	267.32	134.69	79.59	0.00

**Movement, Approach, & Intersection Results**

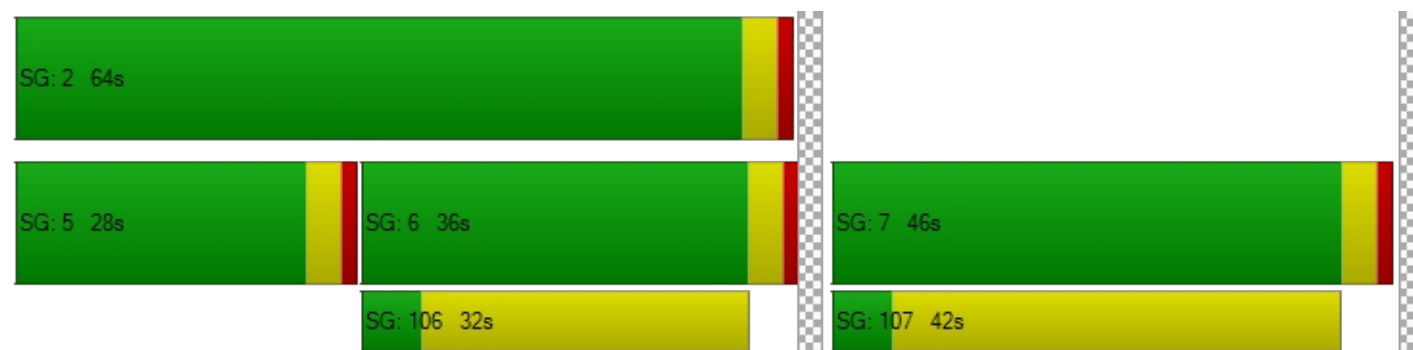
d_M, Delay for Movement [s/veh]	45.55	0.00	49.09	6.27	14.82	0.00
Movement LOS	D	A	D	A	B	A
d_A, Approach Delay [s/veh]	45.55		22.70		14.82	
Approach LOS	D		C		B	
d_I, Intersection Delay [s/veh]	28.16					
Intersection LOS	C					
Intersection V/C	0.420					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.36	46.36	46.36
I_p,int, Pedestrian LOS Score for Intersection	3.202	2.949	3.076
Crosswalk LOS	C	C	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	764	1091	582
d_b, Bicycle Delay [s]	21.01	11.36	27.65
I_b,int, Bicycle LOS Score for Intersection	1.560	2.564	1.957
Bicycle LOS	A	B	A

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 47: 48th Avenue/Powhatan Road

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.488

Intersection Setup

Name	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	3	0	0	2	0	1	2	0	0	2	0	1
Entry Pocket Length [ft]	200.0	100.0	100.0	200.0	100.0	200.0	200.0	100.0	100.0	200.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Powhaton Road			Powhaton Road			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	200	1100	100	10	700	90	200	200	45	60	80	40
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	0	0	0	0	26	15	15	7	0	26	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	50	0	0	58	0	0	52	0	0	20
Total Hourly Volume [veh/h]	211	1100	50	10	700	58	215	215	0	60	106	20
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	57	299	14	3	190	16	58	58	0	16	29	5
Total Analysis Volume [veh/h]	229	1196	54	11	761	63	234	234	0	65	115	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	9	39	0	13	40	0	9	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	27	0	0	30	0	0	31	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	64	64	1	57	57	9	15	15	4	10	10
g / C, Green / Cycle	0.08	0.64	0.64	0.01	0.57	0.57	0.09	0.15	0.15	0.04	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.07	0.37	0.04	0.00	0.24	0.04	0.08	0.07	0.00	0.02	0.04	0.02
s, saturation flow rate [veh/h]	3113	3204	1431	3113	3204	1431	3113	3204	1431	3113	3204	1431
c, Capacity [veh/h]	251	2040	911	45	1827	816	282	469	209	133	316	141
d1, Uniform Delay [s]	45.67	10.55	6.87	48.81	12.13	9.67	44.77	39.36	0.00	46.85	42.21	41.33
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering 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
d2, Incremental Delay [s]	12.16	1.24	0.12	2.81	0.70	0.18	6.18	0.82	0.00	2.74	0.70	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.91	0.59	0.06	0.25	0.42	0.08	0.83	0.50	0.00	0.49	0.36	0.16
d, Delay for Lane Group [s/veh]	57.83	11.79	6.99	51.62	12.83	9.86	50.94	40.19	0.00	49.58	42.91	41.84
Lane Group LOS	E	B	A	D	B	A	D	D	A	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.23	7.21	0.43	0.15	4.69	0.64	3.08	2.69	0.00	0.84	1.35	0.52
50th-Percentile Queue Length [ft/ln]	80.69	180.1	10.86	3.82	117.1	15.93	76.91	67.13	0.00	20.96	33.85	12.89
95th-Percentile Queue Length [veh/ln]	5.81	11.61	0.78	0.28	8.24	1.15	5.54	4.83	0.00	1.51	2.44	0.93
95th-Percentile Queue Length [ft/ln]	145.2	290.1	19.56	6.88	205.9	28.67	138.4	120.8	0.00	37.74	60.93	23.20

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	57.83	11.79	6.99	51.62	12.83	9.86	50.94	40.19	0.00	49.58	42.91	41.84
Movement LOS	E	B	A	D	B	A	D	D	A	D	D	D
d_A, Approach Delay [s/veh]	18.74			13.11			45.57			44.94		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	23.15											
Intersection LOS	C											
Intersection V/C	0.488											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	41.44			41.44			41.44			41.44		
I_p,int, Pedestrian LOS Score for Intersection	3.088			3.103			3.038			2.709		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	759			700			719			640		
d_b, Bicycle Delay [s]	19.25			21.16			20.51			23.15		
I_b,int, Bicycle LOS Score for Intersection	2.821			2.296			1.989			1.743		
Bicycle LOS	C			B			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Intersection Level Of Service Report

Intersection 48: 38th Parkway/Powhaton Road

Control Type:	Signalized	Delay (sec / veh):	27.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.515

Intersection Setup

Name	Powhaton Road			Powhaton Road			38th Parkway					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	2	0	1	1	0	1	2	0	1
Entry Pocket Length [ft]	150.0	100.0	150.0	150.0	100.0	150.0	200.0	100.0	200.0	200.0	100.0	200.0
No. of Lanes in Exit Pocket	0	0	0	0	0	2	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Powhatan Road			Powhatan Road			38th Parkway					
Base Volume Input [veh/h]	152	974	168	64	711	30	20	78	83	597	111	406
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	67	11	0	0	7	0	0	0	39	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	84	0	0	15	0	0	61	0	0	203
Total Hourly Volume [veh/h]	219	985	84	64	718	15	20	78	61	597	111	203
Peak Hour Factor	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.920
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	60	268	23	17	195	4	5	21	17	162	30	55
Total Analysis Volume [veh/h]	238	1071	91	70	780	16	22	85	66	649	121	221
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtP	Permi	Permi	Protec	Permi	Permi	ProtP	Permi	Permi	Protec	Permi	Permi
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	30	0	10	31	0	9	36	0	34	61	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	21	0	0	14	0	0	27	0	0	34	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	63	54	54	4	54	54	39	10	10	25	33	33
g / C, Green / Cycle	0.57	0.49	0.49	0.04	0.49	0.49	0.36	0.09	0.09	0.23	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.33	0.23	0.06	0.02	0.17	0.01	0.02	0.05	0.05	0.21	0.07	0.15
s, saturation flow rate [veh/h]	726	4584	1431	3113	4584	1431	1012	1683	1431	3113	1683	1431
c, Capacity [veh/h]	438	2252	703	128	2228	695	407	153	130	721	503	428
d1, Uniform Delay [s]	14.52	18.59	15.22	51.79	17.53	14.71	23.12	47.94	47.72	41.05	29.14	31.99
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering 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
d2, Incremental Delay [s]	4.77	0.72	0.38	3.62	0.43	0.06	0.05	3.16	3.06	4.41	0.24	0.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.54	0.48	0.13	0.55	0.35	0.02	0.05	0.56	0.51	0.90	0.24	0.52
d, Delay for Lane Group [s/veh]	19.29	19.32	15.60	55.41	17.96	14.77	23.17	51.10	50.79	45.46	29.38	32.95
Lane Group LOS	B	B	B	E	B	B	C	D	D	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.46	6.04	1.30	1.01	4.10	0.22	0.38	2.36	1.83	8.89	2.45	4.96
50th-Percentile Queue Length [ft/ln]	86.40	150.9	32.56	25.28	102.5	5.47	9.49	59.12	45.87	222.2	61.30	124.0
95th-Percentile Queue Length [veh/ln]	6.22	10.07	2.34	1.82	7.38	0.39	0.68	4.26	3.30	13.78	4.41	8.62
95th-Percentile Queue Length [ft/ln]	155.5	251.6	58.61	45.50	184.5	9.85	17.08	106.4	82.57	344.5	110.3	215.3

**Movement, Approach, & Intersection Results**

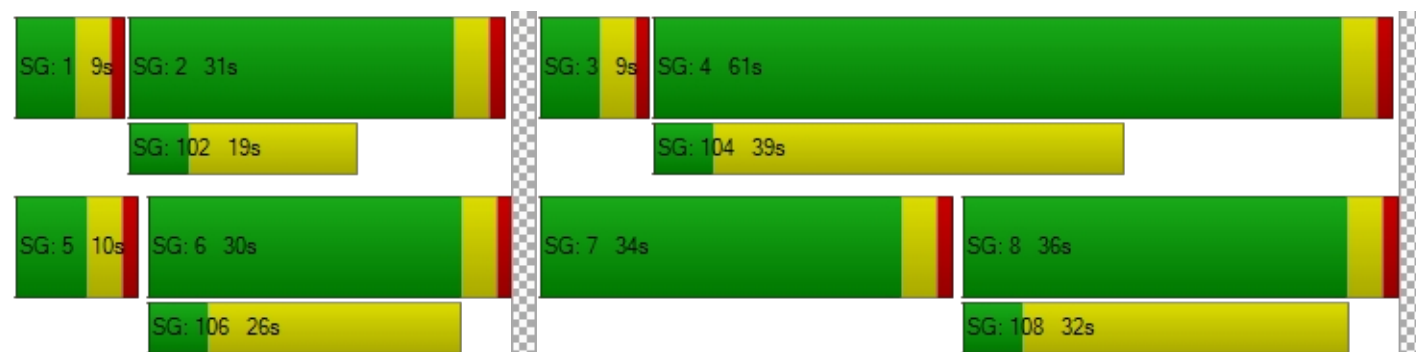
d_M, Delay for Movement [s/veh]	19.29	19.32	15.60	55.41	17.96	14.77	23.17	51.10	50.79	45.46	29.38	32.95
Movement LOS	B	B	B	E	B	B	C	D	D	D	C	C
d_A, Approach Delay [s/veh]	19.07			20.93			47.43			40.71		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	27.22											
Intersection LOS	C											
Intersection V/C	0.515											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	46.39			46.39			46.39			46.39		
I_p,int, Pedestrian LOS Score for Intersection	3.227			3.243			2.552			3.000		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			491			582			1036		
d_b, Bicycle Delay [s]	32.10			31.34			27.68			12.79		
I_b,int, Bicycle LOS Score for Intersection	2.376			2.044			1.946			3.530		
Bicycle LOS	B			B			A			D		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Signal Warrants Report For Intersection 17: 42nd Avenue/Fultondale Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	145	124	0	153
2	141	120	0	148
3	138	118	0	145
4	129	110	0	136
5	115	98	0	121
6	113	97	0	119
7	112	95	0	118
8	102	87	0	107
9	100	86	0	106
10	99	84	0	104
11	86	73	0	90
12	80	68	0	84
13	78	67	0	83
14	58	50	0	61
15	58	50	0	61
16	41	35	0	43
17	23	20	0	24
18	23	20	0	24
19	13	11	0	14
20	7	6	0	8
21	4	4	0	5
22	1	1	0	2
23	1	1	0	2
24	1	1	0	2



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	269	3	153	No	No	No	No	No	No	No	No	No	No
2	2	261	3	148	No	No	No	No	No	No	No	No	No	No
3	2	256	3	145	No	No	No	No	No	No	No	No	No	No
4	2	239	3	136	No	No	No	No	No	No	No	No	No	No
5	2	213	3	121	No	No	No	No	No	No	No	No	No	No
6	2	210	3	119	No	No	No	No	No	No	No	No	No	No
7	2	207	3	118	No	No	No	No	No	No	No	No	No	No
8	2	189	3	107	No	No	No	No	No	No	No	No	No	No
9	2	186	3	106	No	No	No	No	No	No	No	No	No	No
10	2	183	3	104	No	No	No	No	No	No	No	No	No	No
11	2	159	3	90	No	No	No	No	No	No	No	No	No	No
12	2	148	3	84	No	No	No	No	No	No	No	No	No	No
13	2	145	3	83	No	No	No	No	No	No	No	No	No	No
14	2	108	3	61	No	No	No	No	No	No	No	No	No	No
15	2	108	3	61	No	No	No	No	No	No	No	No	No	No
16	2	76	3	43	No	No	No	No	No	No	No	No	No	No
17	2	43	3	24	No	No	No	No	No	No	No	No	No	No
18	2	43	3	24	No	No	No	No	No	No	No	No	No	No
19	2	24	3	14	No	No	No	No	No	No	No	No	No	No
20	2	13	3	8	No	No	No	No	No	No	No	No	No	No
21	2	8	3	5	No	No	No	No	No	No	No	No	No	No
22	2	2	3	2	No	No	No	No	No	No	No	No	No	No
23	2	2	3	2	No	No	No	No	No	No	No	No	No	No
24	2	2	3	2	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.6	10.6
Number of Lanes on Minor Street Approach	2	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	0:26
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	153
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	422	422
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 23: 42nd Ave/PA 13.1 Access 2

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S, N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	E	W	S	N
1	143	174	0	0
2	139	169	0	0
3	136	165	0	0
4	127	155	0	0
5	113	137	0	0
6	112	136	0	0
7	110	134	0	0
8	100	122	0	0
9	99	120	0	0
10	97	118	0	0
11	84	103	0	0
12	79	96	0	0
13	77	94	0	0
14	57	70	0	0
15	57	70	0	0
16	40	49	0	0
17	23	28	0	0
18	23	28	0	0
19	13	16	0	0
20	7	9	0	0
21	4	5	0	0
22	1	2	0	0
23	1	2	0	0
24	1	2	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	317	1	0	No	No	No	No	No	No	No	No	No	No
2	2	308	1	0	No	No	No	No	No	No	No	No	No	No
3	2	301	1	0	No	No	No	No	No	No	No	No	No	No
4	2	282	1	0	No	No	No	No	No	No	No	No	No	No
5	2	250	1	0	No	No	No	No	No	No	No	No	No	No
6	2	248	1	0	No	No	No	No	No	No	No	No	No	No
7	2	244	1	0	No	No	No	No	No	No	No	No	No	No
8	2	222	1	0	No	No	No	No	No	No	No	No	No	No
9	2	219	1	0	No	No	No	No	No	No	No	No	No	No
10	2	215	1	0	No	No	No	No	No	No	No	No	No	No
11	2	187	1	0	No	No	No	No	No	No	No	No	No	No
12	2	175	1	0	No	No	No	No	No	No	No	No	No	No
13	2	171	1	0	No	No	No	No	No	No	No	No	No	No
14	2	127	1	0	No	No	No	No	No	No	No	No	No	No
15	2	127	1	0	No	No	No	No	No	No	No	No	No	No
16	2	89	1	0	No	No	No	No	No	No	No	No	No	No
17	2	51	1	0	No	No	No	No	No	No	No	No	No	No
18	2	51	1	0	No	No	No	No	No	No	No	No	No	No
19	2	29	1	0	No	No	No	No	No	No	No	No	No	No
20	2	16	1	0	No	No	No	No	No	No	No	No	No	No
21	2	9	1	0	No	No	No	No	No	No	No	No	No	No
22	2	3	1	0	No	No	No	No	No	No	No	No	No	No
23	2	3	1	0	No	No	No	No	No	No	No	No	No	No
24	2	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	10.5	10.5
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00	0:00
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	0
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	317	317
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 24: 48th Ave/Road D

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	405	528	14
2	393	512	14
3	385	502	13
4	360	470	12
5	320	417	11
6	316	412	11
7	312	407	11
8	284	370	10
9	279	364	10
10	275	359	10
11	239	312	8
12	223	290	8
13	219	285	8
14	162	211	6
15	162	211	6
16	113	148	4
17	65	84	2
18	65	84	2
19	36	48	1
20	20	26	1
21	12	16	0
22	4	5	0
23	4	5	0
24	4	5	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	933	1	14	No	No	No	No	No	No	No	No	No	No
2	3	905	1	14	No	No	No	No	No	No	No	No	No	No
3	3	887	1	13	No	No	No	No	No	No	No	No	No	No
4	3	830	1	12	No	No	No	No	No	No	No	No	No	No
5	3	737	1	11	No	No	No	No	No	No	No	No	No	No
6	3	728	1	11	No	No	No	No	No	No	No	No	No	No
7	3	719	1	11	No	No	No	No	No	No	No	No	No	No
8	3	654	1	10	No	No	No	No	No	No	No	No	No	No
9	3	643	1	10	No	No	No	No	No	No	No	No	No	No
10	3	634	1	10	No	No	No	No	No	No	No	No	No	No
11	3	551	1	8	No	No	No	No	No	No	No	No	No	No
12	3	513	1	8	No	No	No	No	No	No	No	No	No	No
13	3	504	1	8	No	No	No	No	No	No	No	No	No	No
14	3	373	1	6	No	No	No	No	No	No	No	No	No	No
15	3	373	1	6	No	No	No	No	No	No	No	No	No	No
16	3	261	1	4	No	No	No	No	No	No	No	No	No	No
17	3	149	1	2	No	No	No	No	No	No	No	No	No	No
18	3	149	1	2	No	No	No	No	No	No	No	No	No	No
19	3	84	1	1	No	No	No	No	No	No	No	No	No	No
20	3	46	1	1	No	No	No	No	No	No	No	No	No	No
21	3	28	1	0	No	No	No	No	No	No	No	No	No	No
22	3	9	1	0	No	No	No	No	No	No	No	No	No	No
23	3	9	1	0	No	No	No	No	No	No	No	No	No	No
24	3	9	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	10
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:02
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	14
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	947
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 25: 48th Avenue/PA-31 Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	433	511	145
2	420	496	141
3	411	485	138
4	385	455	129
5	342	404	115
6	338	399	113
7	333	393	112
8	303	358	102
9	299	353	100
10	294	347	99
11	255	301	86
12	238	281	80
13	234	276	78
14	173	204	58
15	173	204	58
16	121	143	41
17	69	82	23
18	69	82	23
19	39	46	13
20	22	26	7
21	13	15	4
22	4	5	1
23	4	5	1
24	4	5	1



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	944	2	145	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No
2	3	916	2	141	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No
3	3	896	2	138	No	No	No	Yes	No	Yes	Yes	Yes	No	No
4	3	840	2	129	No	No	No	Yes	No	Yes	Yes	Yes	No	No
5	3	746	2	115	No	No	No	Yes	No	Yes	Yes	Yes	No	No
6	3	737	2	113	No	No	No	Yes	No	Yes	Yes	Yes	No	No
7	3	726	2	112	No	No	No	Yes	No	Yes	Yes	Yes	No	No
8	3	661	2	102	No	No	No	No	No	No	Yes	Yes	No	No
9	3	652	2	100	No	No	No	No	No	No	Yes	Yes	No	No
10	3	641	2	99	No	No	No	No	No	No	Yes	Yes	No	No
11	3	556	2	86	No	No	No	No	No	No	No	Yes	No	No
12	3	519	2	80	No	No	No	No	No	No	No	Yes	No	No
13	3	510	2	78	No	No	No	No	No	No	No	Yes	No	No
14	3	377	2	58	No	No	No	No	No	No	No	No	No	No
15	3	377	2	58	No	No	No	No	No	No	No	No	No	No
16	3	264	2	41	No	No	No	No	No	No	No	No	No	No
17	3	151	2	23	No	No	No	No	No	No	No	No	No	No
18	3	151	2	23	No	No	No	No	No	No	No	No	No	No
19	3	85	2	13	No	No	No	No	No	No	No	No	No	No
20	3	48	2	7	No	No	No	No	No	No	No	No	No	No
21	3	28	2	4	No	No	No	No	No	No	No	No	No	No
22	3	9	2	1	No	No	No	No	No	No	No	No	No	No
23	3	9	2	1	No	No	No	No	No	No	No	No	No	No
24	3	9	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	2	7	2	7	10	13	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	13.5
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:32
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	145
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1089
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 26: Reserve Loop/PA-31 Street

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	34	165	90
2	33	160	87
3	32	157	86
4	30	147	80
5	27	130	71
6	27	129	70
7	26	127	69
8	24	115	63
9	23	114	62
10	23	112	61
11	20	97	53
12	19	91	50
13	18	89	49
14	14	66	36
15	14	66	36
16	10	46	25
17	5	26	14
18	5	26	14
19	3	15	8
20	2	8	5
21	1	5	3
22	0	2	1
23	0	2	1
24	0	2	1



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	199	2	90	No	No	No	No	No	No	No	No	No	No
2	2	193	2	87	No	No	No	No	No	No	No	No	No	No
3	2	189	2	86	No	No	No	No	No	No	No	No	No	No
4	2	177	2	80	No	No	No	No	No	No	No	No	No	No
5	2	157	2	71	No	No	No	No	No	No	No	No	No	No
6	2	156	2	70	No	No	No	No	No	No	No	No	No	No
7	2	153	2	69	No	No	No	No	No	No	No	No	No	No
8	2	139	2	63	No	No	No	No	No	No	No	No	No	No
9	2	137	2	62	No	No	No	No	No	No	No	No	No	No
10	2	135	2	61	No	No	No	No	No	No	No	No	No	No
11	2	117	2	53	No	No	No	No	No	No	No	No	No	No
12	2	110	2	50	No	No	No	No	No	No	No	No	No	No
13	2	107	2	49	No	No	No	No	No	No	No	No	No	No
14	2	80	2	36	No	No	No	No	No	No	No	No	No	No
15	2	80	2	36	No	No	No	No	No	No	No	No	No	No
16	2	56	2	25	No	No	No	No	No	No	No	No	No	No
17	2	31	2	14	No	No	No	No	No	No	No	No	No	No
18	2	31	2	14	No	No	No	No	No	No	No	No	No	No
19	2	18	2	8	No	No	No	No	No	No	No	No	No	No
20	2	10	2	5	No	No	No	No	No	No	No	No	No	No
21	2	6	2	3	No	No	No	No	No	No	No	No	No	No
22	2	2	2	1	No	No	No	No	No	No	No	No	No	No
23	2	2	2	1	No	No	No	No	No	No	No	No	No	No
24	2	2	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.9
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:13
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	90
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	289
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 27: Reserve Loop/Road C

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	122	188	12
2	118	182	12
3	116	179	11
4	109	167	11
5	96	149	9
6	95	147	9
7	94	145	9
8	85	132	8
9	84	130	8
10	83	128	8
11	72	111	7
12	67	103	7
13	66	102	6
14	49	75	5
15	49	75	5
16	34	53	3
17	20	30	2
18	20	30	2
19	11	17	1
20	6	9	1
21	4	6	0
22	1	2	0
23	1	2	0
24	1	2	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	310	1	12	No	No	No	No	No	No	No	No	No	No
2	1	300	1	12	No	No	No	No	No	No	No	No	No	No
3	1	295	1	11	No	No	No	No	No	No	No	No	No	No
4	1	276	1	11	No	No	No	No	No	No	No	No	No	No
5	1	245	1	9	No	No	No	No	No	No	No	No	No	No
6	1	242	1	9	No	No	No	No	No	No	No	No	No	No
7	1	239	1	9	No	No	No	No	No	No	No	No	No	No
8	1	217	1	8	No	No	No	No	No	No	No	No	No	No
9	1	214	1	8	No	No	No	No	No	No	No	No	No	No
10	1	211	1	8	No	No	No	No	No	No	No	No	No	No
11	1	183	1	7	No	No	No	No	No	No	No	No	No	No
12	1	170	1	7	No	No	No	No	No	No	No	No	No	No
13	1	168	1	6	No	No	No	No	No	No	No	No	No	No
14	1	124	1	5	No	No	No	No	No	No	No	No	No	No
15	1	124	1	5	No	No	No	No	No	No	No	No	No	No
16	1	87	1	3	No	No	No	No	No	No	No	No	No	No
17	1	50	1	2	No	No	No	No	No	No	No	No	No	No
18	1	50	1	2	No	No	No	No	No	No	No	No	No	No
19	1	28	1	1	No	No	No	No	No	No	No	No	No	No
20	1	15	1	1	No	No	No	No	No	No	No	No	No	No
21	1	10	1	0	No	No	No	No	No	No	No	No	No	No
22	1	3	1	0	No	No	No	No	No	No	No	No	No	No
23	1	3	1	0	No	No	No	No	No	No	No	No	No	No
24	1	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:01
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	12
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	322
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 28: Reserve Loop/Road B

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	134	162	47	25
2	130	157	46	24
3	127	154	45	24
4	119	144	42	22
5	106	128	37	20
6	105	126	37	20
7	103	125	36	19
8	94	113	33	18
9	92	112	32	17
10	91	110	32	17
11	79	96	28	15
12	74	89	26	14
13	72	87	25	14
14	54	65	19	10
15	54	65	19	10
16	38	45	13	7
17	21	26	8	4
18	21	26	8	4
19	12	15	4	2
20	7	8	2	1
21	4	5	1	1
22	1	2	0	0
23	1	2	0	0
24	1	2	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	296	1	47	No	No	No	No	No	No	No	No	No	No
2	2	287	1	46	No	No	No	No	No	No	No	No	No	No
3	2	281	1	45	No	No	No	No	No	No	No	No	No	No
4	2	263	1	42	No	No	No	No	No	No	No	No	No	No
5	2	234	1	37	No	No	No	No	No	No	No	No	No	No
6	2	231	1	37	No	No	No	No	No	No	No	No	No	No
7	2	228	1	36	No	No	No	No	No	No	No	No	No	No
8	2	207	1	33	No	No	No	No	No	No	No	No	No	No
9	2	204	1	32	No	No	No	No	No	No	No	No	No	No
10	2	201	1	32	No	No	No	No	No	No	No	No	No	No
11	2	175	1	28	No	No	No	No	No	No	No	No	No	No
12	2	163	1	26	No	No	No	No	No	No	No	No	No	No
13	2	159	1	25	No	No	No	No	No	No	No	No	No	No
14	2	119	1	19	No	No	No	No	No	No	No	No	No	No
15	2	119	1	19	No	No	No	No	No	No	No	No	No	No
16	2	83	1	13	No	No	No	No	No	No	No	No	No	No
17	2	47	1	8	No	No	No	No	No	No	No	No	No	No
18	2	47	1	8	No	No	No	No	No	No	No	No	No	No
19	2	27	1	4	No	No	No	No	No	No	No	No	No	No
20	2	15	1	2	No	No	No	No	No	No	No	No	No	No
21	2	9	1	1	No	No	No	No	No	No	No	No	No	No
22	2	3	1	0	No	No	No	No	No	No	No	No	No	No
23	2	3	1	0	No	No	No	No	No	No	No	No	No	No
24	2	3	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.9	11.6
Number of Lanes on Minor Street Approach	2	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:07	0:04
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	47	25
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	368	368
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 29: Reserve Loop/Road A

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	N	S	E	W
1	42	244	21	42
2	41	237	20	41
3	40	232	20	40
4	37	217	19	37
5	33	193	17	33
6	33	190	16	33
7	32	188	16	32
8	29	171	15	29
9	29	168	14	29
10	29	166	14	29
11	25	144	12	25
12	23	134	12	23
13	23	132	11	23
14	17	98	8	17
15	17	98	8	17
16	12	68	6	12
17	7	39	3	7
18	7	39	3	7
19	4	22	2	4
20	2	12	1	2
21	1	7	1	1
22	0	2	0	0
23	0	2	0	0
24	0	2	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	286	1	42	No	No	No	No	No	No	No	No	No	No
2	2	278	1	41	No	No	No	No	No	No	No	No	No	No
3	2	272	1	40	No	No	No	No	No	No	No	No	No	No
4	2	254	1	37	No	No	No	No	No	No	No	No	No	No
5	2	226	1	33	No	No	No	No	No	No	No	No	No	No
6	2	223	1	33	No	No	No	No	No	No	No	No	No	No
7	2	220	1	32	No	No	No	No	No	No	No	No	No	No
8	2	200	1	29	No	No	No	No	No	No	No	No	No	No
9	2	197	1	29	No	No	No	No	No	No	No	No	No	No
10	2	195	1	29	No	No	No	No	No	No	No	No	No	No
11	2	169	1	25	No	No	No	No	No	No	No	No	No	No
12	2	157	1	23	No	No	No	No	No	No	No	No	No	No
13	2	155	1	23	No	No	No	No	No	No	No	No	No	No
14	2	115	1	17	No	No	No	No	No	No	No	No	No	No
15	2	115	1	17	No	No	No	No	No	No	No	No	No	No
16	2	80	1	12	No	No	No	No	No	No	No	No	No	No
17	2	46	1	7	No	No	No	No	No	No	No	No	No	No
18	2	46	1	7	No	No	No	No	No	No	No	No	No	No
19	2	26	1	4	No	No	No	No	No	No	No	No	No	No
20	2	14	1	2	No	No	No	No	No	No	No	No	No	No
21	2	8	1	1	No	No	No	No	No	No	No	No	No	No
22	2	2	1	0	No	No	No	No	No	No	No	No	No	No
23	2	2	1	0	No	No	No	No	No	No	No	No	No	No
24	2	2	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.9	9.3
Number of Lanes on Minor Street Approach	2	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:04	0:06
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	21	42
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	349	349
Number of Approaches on Intersection	4	4
Total Volume Condition Met	No	No
Warrant Met for Approach	No	No
Warrant Met for Intersection	No	



Signal Warrants Report For Intersection 40: 38th Parkway/Reserve Loop (W)

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	53	66	58
2	51	64	56
3	50	63	55
4	47	59	52
5	42	52	46
6	41	51	45
7	41	51	45
8	37	46	41
9	37	46	40
10	36	45	39
11	31	39	34
12	29	36	32
13	29	36	31
14	21	26	23
15	21	26	23
16	15	18	16
17	8	11	9
18	8	11	9
19	5	6	5
20	3	3	3
21	2	2	2
22	1	1	1
23	1	1	1
24	1	1	1



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	119	1	58	No	No	No	No	No	No	No	No	No	No
2	2	115	1	56	No	No	No	No	No	No	No	No	No	No
3	2	113	1	55	No	No	No	No	No	No	No	No	No	No
4	2	106	1	52	No	No	No	No	No	No	No	No	No	No
5	2	94	1	46	No	No	No	No	No	No	No	No	No	No
6	2	92	1	45	No	No	No	No	No	No	No	No	No	No
7	2	92	1	45	No	No	No	No	No	No	No	No	No	No
8	2	83	1	41	No	No	No	No	No	No	No	No	No	No
9	2	83	1	40	No	No	No	No	No	No	No	No	No	No
10	2	81	1	39	No	No	No	No	No	No	No	No	No	No
11	2	70	1	34	No	No	No	No	No	No	No	No	No	No
12	2	65	1	32	No	No	No	No	No	No	No	No	No	No
13	2	65	1	31	No	No	No	No	No	No	No	No	No	No
14	2	47	1	23	No	No	No	No	No	No	No	No	No	No
15	2	47	1	23	No	No	No	No	No	No	No	No	No	No
16	2	33	1	16	No	No	No	No	No	No	No	No	No	No
17	2	19	1	9	No	No	No	No	No	No	No	No	No	No
18	2	19	1	9	No	No	No	No	No	No	No	No	No	No
19	2	11	1	5	No	No	No	No	No	No	No	No	No	No
20	2	6	1	3	No	No	No	No	No	No	No	No	No	No
21	2	4	1	2	No	No	No	No	No	No	No	No	No	No
22	2	2	1	1	No	No	No	No	No	No	No	No	No	No
23	2	2	1	1	No	No	No	No	No	No	No	No	No	No
24	2	2	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	9.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:08
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	58
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	177
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 41: 38th Parkway/Road E

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	38	66	0
2	37	64	0
3	36	63	0
4	34	59	0
5	30	52	0
6	30	51	0
7	29	51	0
8	27	46	0
9	26	46	0
10	26	45	0
11	22	39	0
12	21	36	0
13	21	36	0
14	15	26	0
15	15	26	0
16	11	18	0
17	6	11	0
18	6	11	0
19	3	6	0
20	2	3	0
21	1	2	0
22	0	1	0
23	0	1	0
24	0	1	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	104	1	0	No	No	No	No	No	No	No	No	No	No
2	2	101	1	0	No	No	No	No	No	No	No	No	No	No
3	2	99	1	0	No	No	No	No	No	No	No	No	No	No
4	2	93	1	0	No	No	No	No	No	No	No	No	No	No
5	2	82	1	0	No	No	No	No	No	No	No	No	No	No
6	2	81	1	0	No	No	No	No	No	No	No	No	No	No
7	2	80	1	0	No	No	No	No	No	No	No	No	No	No
8	2	73	1	0	No	No	No	No	No	No	No	No	No	No
9	2	72	1	0	No	No	No	No	No	No	No	No	No	No
10	2	71	1	0	No	No	No	No	No	No	No	No	No	No
11	2	61	1	0	No	No	No	No	No	No	No	No	No	No
12	2	57	1	0	No	No	No	No	No	No	No	No	No	No
13	2	57	1	0	No	No	No	No	No	No	No	No	No	No
14	2	41	1	0	No	No	No	No	No	No	No	No	No	No
15	2	41	1	0	No	No	No	No	No	No	No	No	No	No
16	2	29	1	0	No	No	No	No	No	No	No	No	No	No
17	2	17	1	0	No	No	No	No	No	No	No	No	No	No
18	2	17	1	0	No	No	No	No	No	No	No	No	No	No
19	2	9	1	0	No	No	No	No	No	No	No	No	No	No
20	2	5	1	0	No	No	No	No	No	No	No	No	No	No
21	2	3	1	0	No	No	No	No	No	No	No	No	No	No
22	2	1	1	0	No	No	No	No	No	No	No	No	No	No
23	2	1	1	0	No	No	No	No	No	No	No	No	No	No
24	2	1	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:00
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	0
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	104
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 42: The Aurora Highlands Parkway/38th Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	N, S
Minor Approaches	E
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	N	S	E
1	30	0	66
2	29	0	64
3	29	0	63
4	27	0	59
5	24	0	52
6	23	0	51
7	23	0	51
8	21	0	46
9	21	0	46
10	20	0	45
11	18	0	39
12	17	0	36
13	16	0	36
14	12	0	26
15	12	0	26
16	8	0	18
17	5	0	11
18	5	0	11
19	3	0	6
20	2	0	3
21	1	0	2
22	0	0	1
23	0	0	1
24	0	0	1



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	30	3	66	No	No	No	No	No	No	No	No	No	No
2	2	29	3	64	No	No	No	No	No	No	No	No	No	No
3	2	29	3	63	No	No	No	No	No	No	No	No	No	No
4	2	27	3	59	No	No	No	No	No	No	No	No	No	No
5	2	24	3	52	No	No	No	No	No	No	No	No	No	No
6	2	23	3	51	No	No	No	No	No	No	No	No	No	No
7	2	23	3	51	No	No	No	No	No	No	No	No	No	No
8	2	21	3	46	No	No	No	No	No	No	No	No	No	No
9	2	21	3	46	No	No	No	No	No	No	No	No	No	No
10	2	20	3	45	No	No	No	No	No	No	No	No	No	No
11	2	18	3	39	No	No	No	No	No	No	No	No	No	No
12	2	17	3	36	No	No	No	No	No	No	No	No	No	No
13	2	16	3	36	No	No	No	No	No	No	No	No	No	No
14	2	12	3	26	No	No	No	No	No	No	No	No	No	No
15	2	12	3	26	No	No	No	No	No	No	No	No	No	No
16	2	8	3	18	No	No	No	No	No	No	No	No	No	No
17	2	5	3	11	No	No	No	No	No	No	No	No	No	No
18	2	5	3	11	No	No	No	No	No	No	No	No	No	No
19	2	3	3	6	No	No	No	No	No	No	No	No	No	No
20	2	2	3	3	No	No	No	No	No	No	No	No	No	No
21	2	1	3	2	No	No	No	No	No	No	No	No	No	No
22	2	0	3	1	No	No	No	No	No	No	No	No	No	No
23	2	0	3	1	No	No	No	No	No	No	No	No	No	No
24	2	0	3	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.6
Number of Lanes on Minor Street Approach	3
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:09
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	66
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	96
Number of Approaches on Intersection	3
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No



Signal Warrants Report For Intersection 43: The Aurora Highlands Parkway/38th Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	W
Minor Approaches	N
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets	Minor Streets
	W	N
1	0	30
2	0	29
3	0	29
4	0	27
5	0	24
6	0	23
7	0	23
8	0	21
9	0	21
10	0	20
11	0	18
12	0	17
13	0	16
14	0	12
15	0	12
16	0	8
17	0	5
18	0	5
19	0	3
20	0	2
21	0	1
22	0	0
23	0	0
24	0	0



Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	0	1	30	No	No	No	No	No	No	No	No	No	No
2	2	0	1	29	No	No	No	No	No	No	No	No	No	No
3	2	0	1	29	No	No	No	No	No	No	No	No	No	No
4	2	0	1	27	No	No	No	No	No	No	No	No	No	No
5	2	0	1	24	No	No	No	No	No	No	No	No	No	No
6	2	0	1	23	No	No	No	No	No	No	No	No	No	No
7	2	0	1	23	No	No	No	No	No	No	No	No	No	No
8	2	0	1	21	No	No	No	No	No	No	No	No	No	No
9	2	0	1	21	No	No	No	No	No	No	No	No	No	No
10	2	0	1	20	No	No	No	No	No	No	No	No	No	No
11	2	0	1	18	No	No	No	No	No	No	No	No	No	No
12	2	0	1	17	No	No	No	No	No	No	No	No	No	No
13	2	0	1	16	No	No	No	No	No	No	No	No	No	No
14	2	0	1	12	No	No	No	No	No	No	No	No	No	No
15	2	0	1	12	No	No	No	No	No	No	No	No	No	No
16	2	0	1	8	No	No	No	No	No	No	No	No	No	No
17	2	0	1	5	No	No	No	No	No	No	No	No	No	No
18	2	0	1	5	No	No	No	No	No	No	No	No	No	No
19	2	0	1	3	No	No	No	No	No	No	No	No	No	No
20	2	0	1	2	No	No	No	No	No	No	No	No	No	No
21	2	0	1	1	No	No	No	No	No	No	No	No	No	No
22	2	0	1	0	No	No	No	No	No	No	No	No	No	No
23	2	0	1	0	No	No	No	No	No	No	No	No	No	No
24	2	0	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	8.6
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach (h:mm)	0:04
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	30
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	30
Number of Approaches on Intersection	2
Total Volume Condition Met	No
Warrant Met for Approach	No
Warrant Met for Intersection	No