

# The Aurora H Tr

Comments 11.3.22:

- 1) The scope/organization of this study is similar to the North A study, which is very helpful by means of comparing the two documents.
- 2) That being said, while trip distribution assumptions are identical, resulting trip assignment and total No Project and With Project trips do not match what is presented in the North A TIS (2nd Referral). Proceeding forward, common intersections will need to be demonstrated to be consistent between the North filings.
- 3) It appears that the summation of site trips on the external nodes exceeds 10k ADTs, while the total trip generation for North B is ~5,900 ADT. Some clarification would be appreciated.
- 4) Information regarding ADTs anticipated for the 48th section between Harvest/Powhaton is present at the end of this document and attached to the email delivery of these comments. The adjustment to NEATS volumes due to a (farther north) connection of Powhaton to Harvest will affect intersection volumes and operations at both 48th/Harvest and 48th/Powhaton intersections, and incorporation of the updated volumes in this study is important to accommodate any possible reduction in intersection geometry, as appropriate.
- 5) Please provide warrant study worksheets for the intersections that are anticipated to be signalized in the Horizon year analysis.
- 6) Ensure intersection recommendations match North A TIS (2nd Referral), primarily 42nd/Denali.
- 7) Provide table on Auxiliary Lane Recommendations similar to Table 6 in the North A study.
- 8) Other more minor comments throughout.

Aerotrop

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**April 20, 2022**

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## 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 42<sup>nd</sup> Avenue and 28<sup>th</sup> Avenue. TAHNorth has been split into three sub-areas; Area A, Area B and Area C.

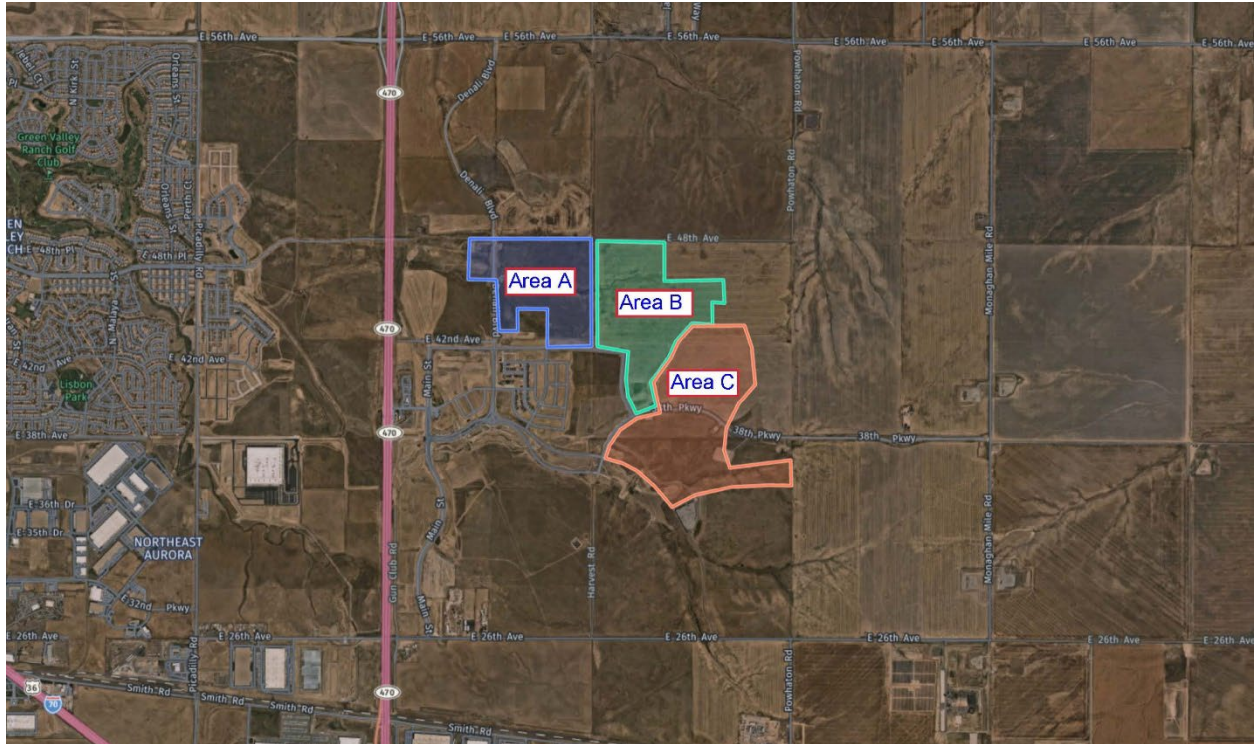
The purpose of this study is to assess the effects the development of the TAH North, Area B will have on the surrounding transportation system.

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**

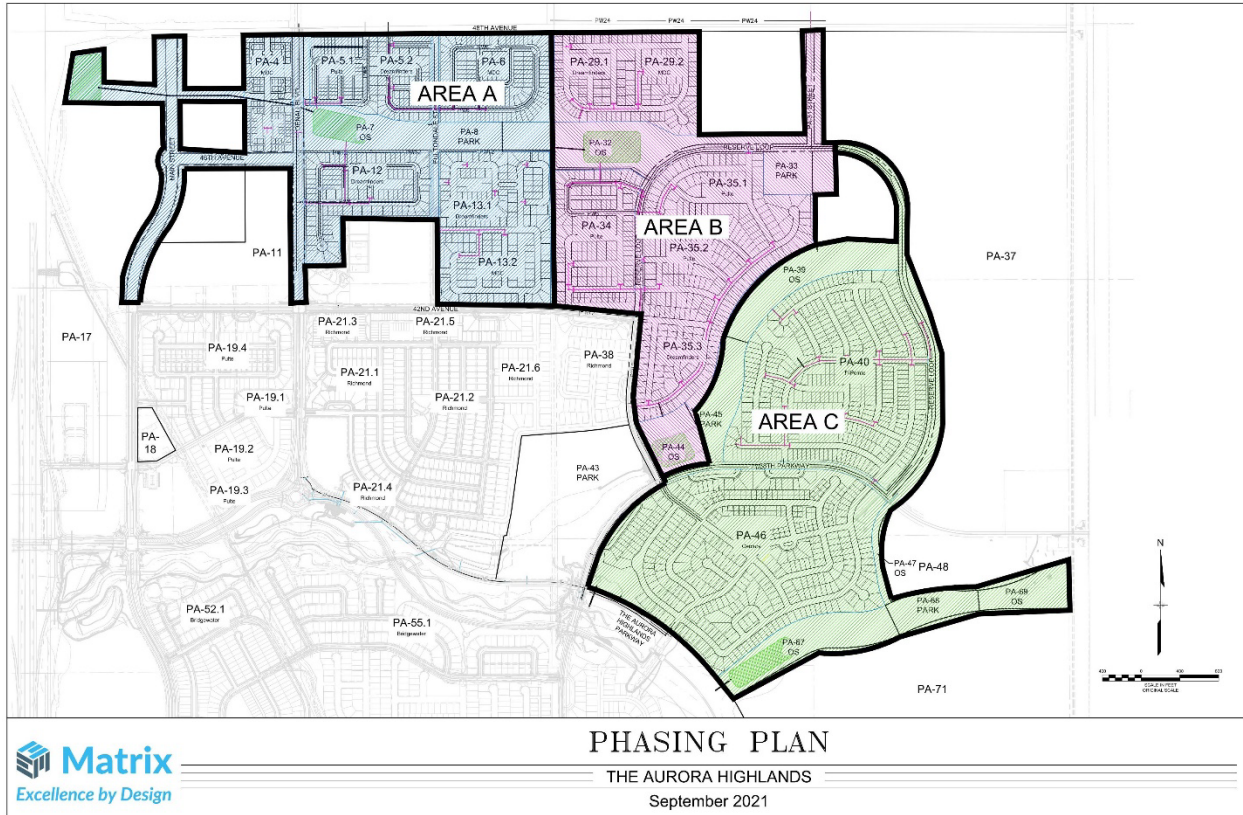


## Proposed Development

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

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 Powhatan Road and the north by 48<sup>th</sup> 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 56<sup>th</sup> Avenue. An interchange is planned at 48<sup>th</sup> Avenue and the bridge over E-470 at 48<sup>th</sup> Avenue is in place (the roadway connecting to it is not yet built, nor are the ramps).

**26<sup>th</sup> 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 26<sup>th</sup> Avenue as a two-lane facility, crossing the Union Pacific (UP) Railroad at-grade, spanning I-70, and extending south to Jewell Avenue.

**48<sup>th</sup> 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. 48<sup>th</sup> 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 48<sup>th</sup> 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 48<sup>th</sup> Avenue will need to be constructed beyond each half-road section. It is assumed that if only the north or south half of 48<sup>th</sup> 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.

**42<sup>nd</sup> 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 38<sup>th</sup> 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.

**38<sup>th</sup> 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 list of informing studies should match the North A TIS, to include Flgs 1, 2, 4, 5, and 8

- The Aurora Highlands Transportation Impact Study; August 2019
- ATEC Traffic Impact Analysis; November 2019
- The Aurora Highlands Filings 7 Phases 1-3 DR Horton Transportation Impact Study; May 2020
- The Aurora Highlands Filing 16 Traffic Impact Study; August 2021
- Windler Master Plan Master Traffic Study; October 2021

## 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
<b>Totals</b>		<b>586</b>	<b>DU</b>	<b>5896</b>	<b>2948</b>	<b>2948</b>	<b>435</b>	<b>113</b>	<b>322</b>	<b>581</b>	<b>367</b>	<b>214</b>

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.

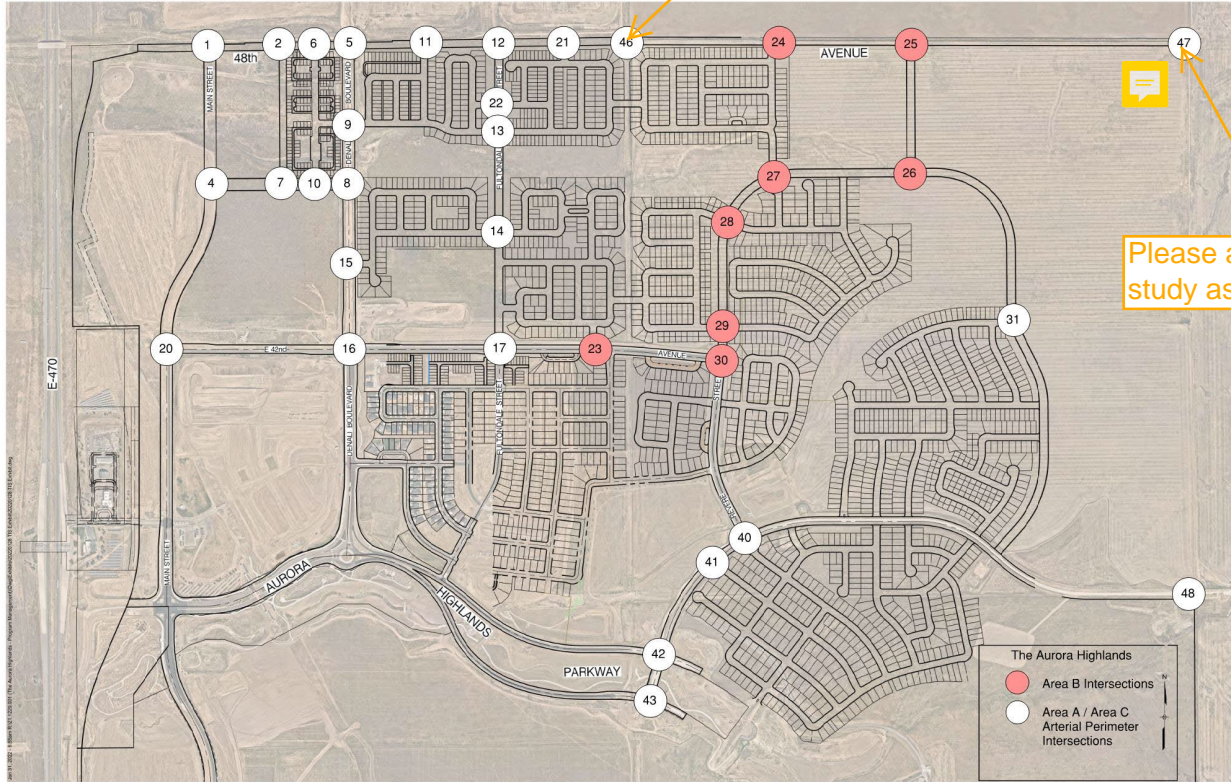


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Add analysis and results for 46 to this study (already completed for North A TIS) for redundancy to support this as a standalone document.

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



Please add 47 to this study as well

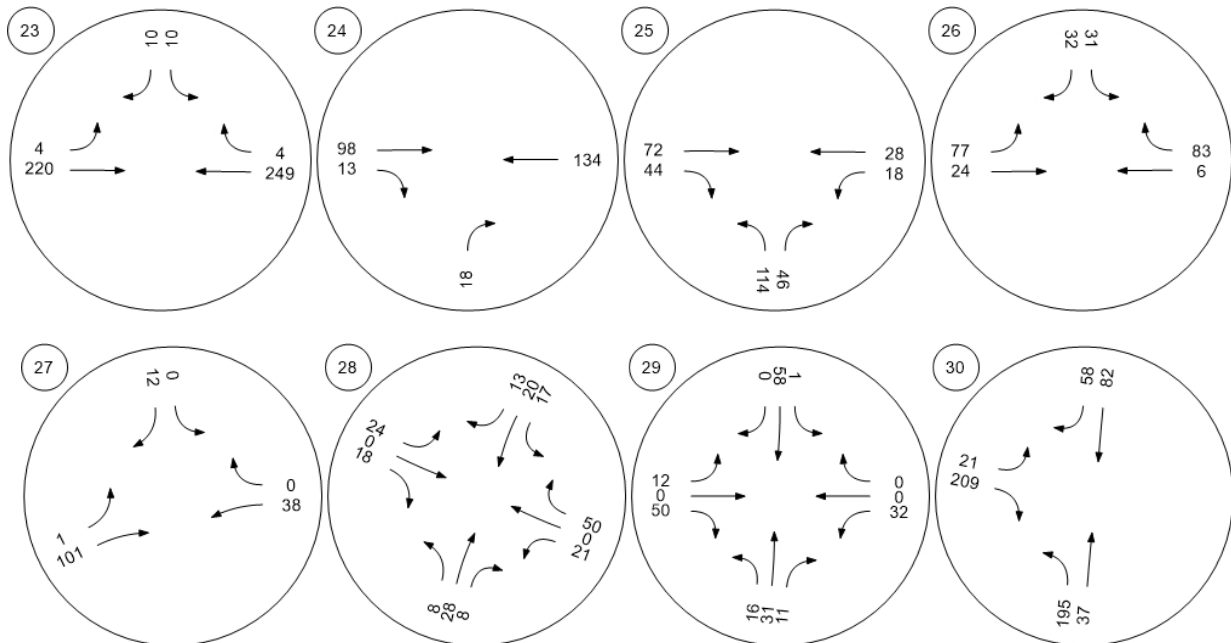
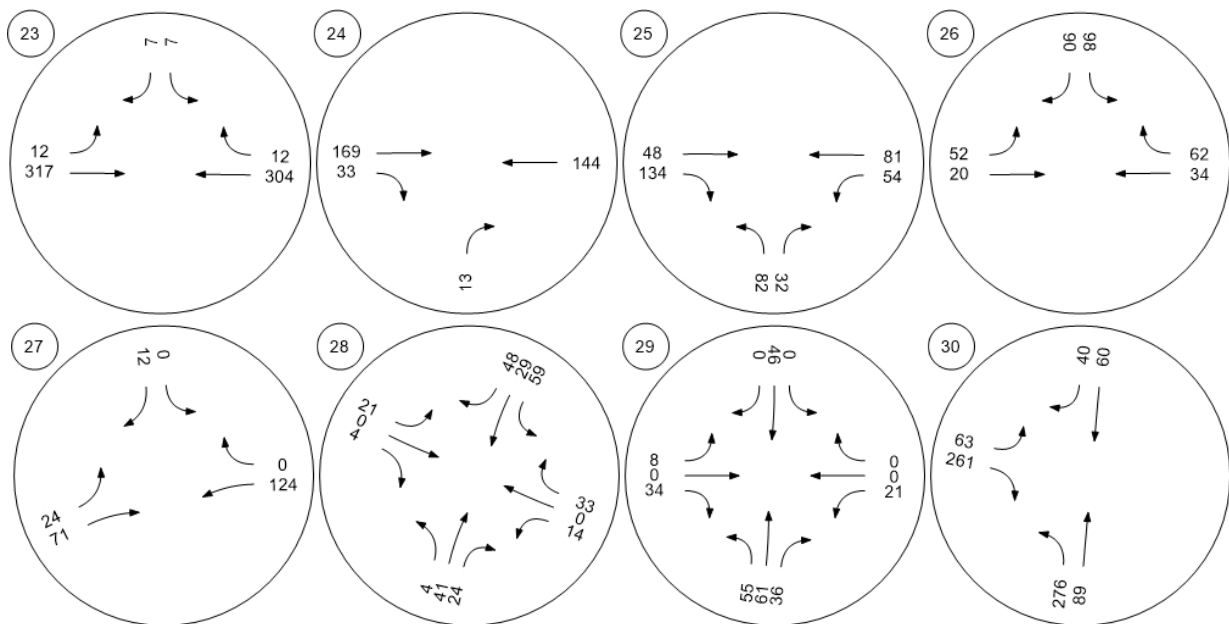
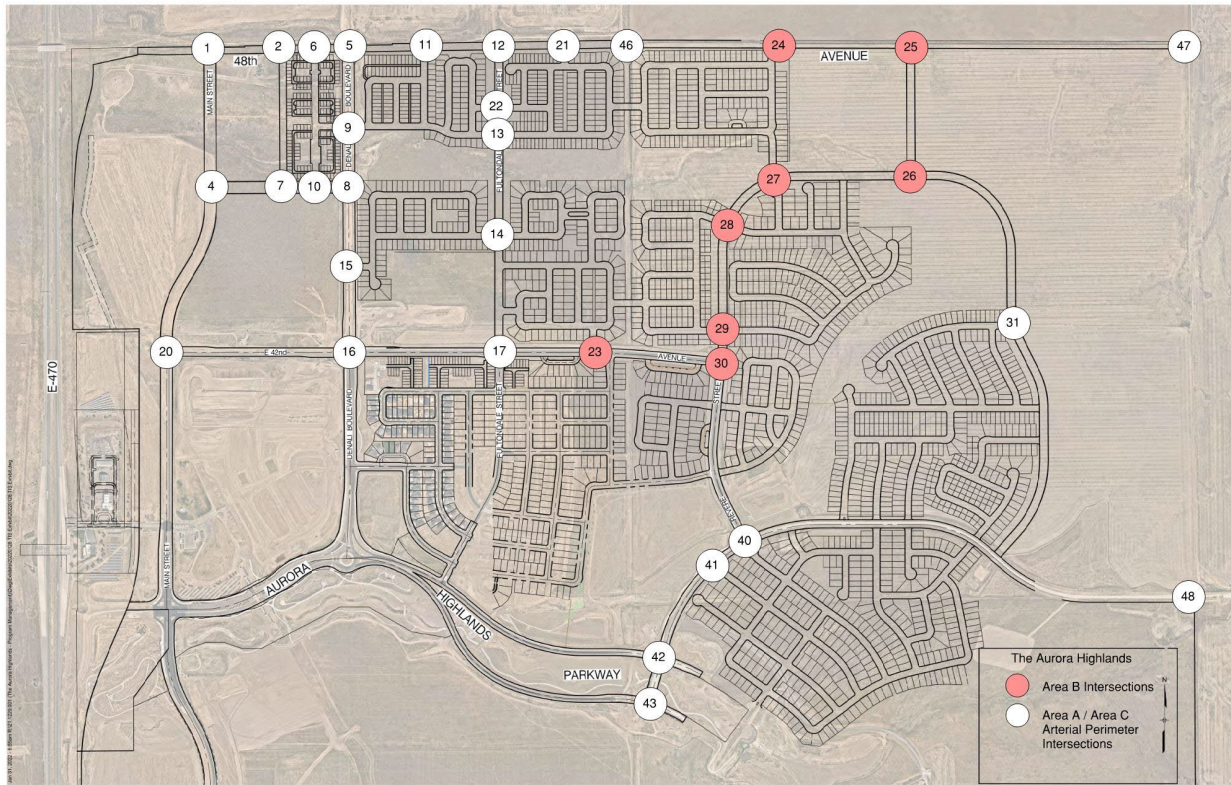




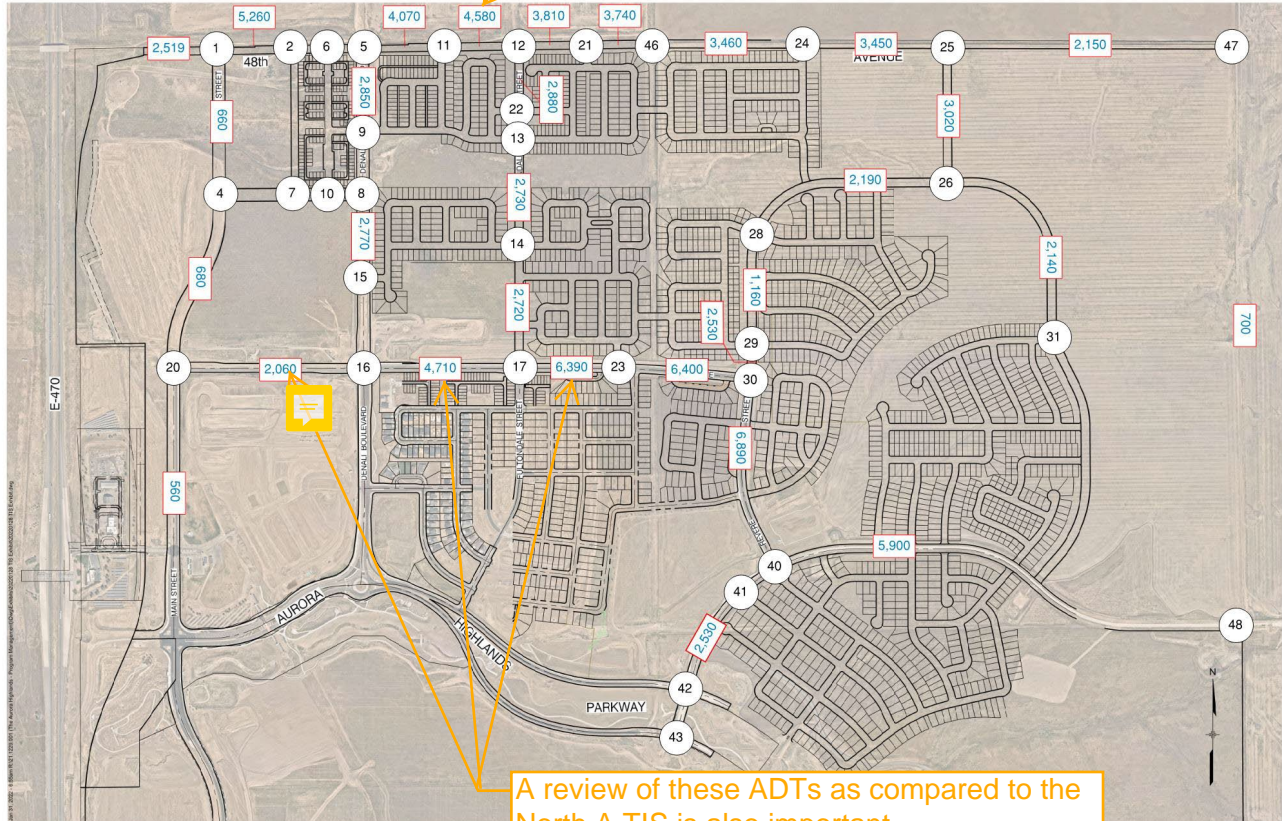
Figure 5. The Aurora Highlands North, Area B Project Trips (PM Peak)





The daily site volumes on 48th are much higher in this study than in the North A TIS (by ~200%), while this site has a lower trip generation than that study. In the case of the North A TIS, the Site ADTs were reduced significantly from 1st Referral to 2nd Referral, so clarification on which are the anticipated volumes for 48th is appreciated.

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

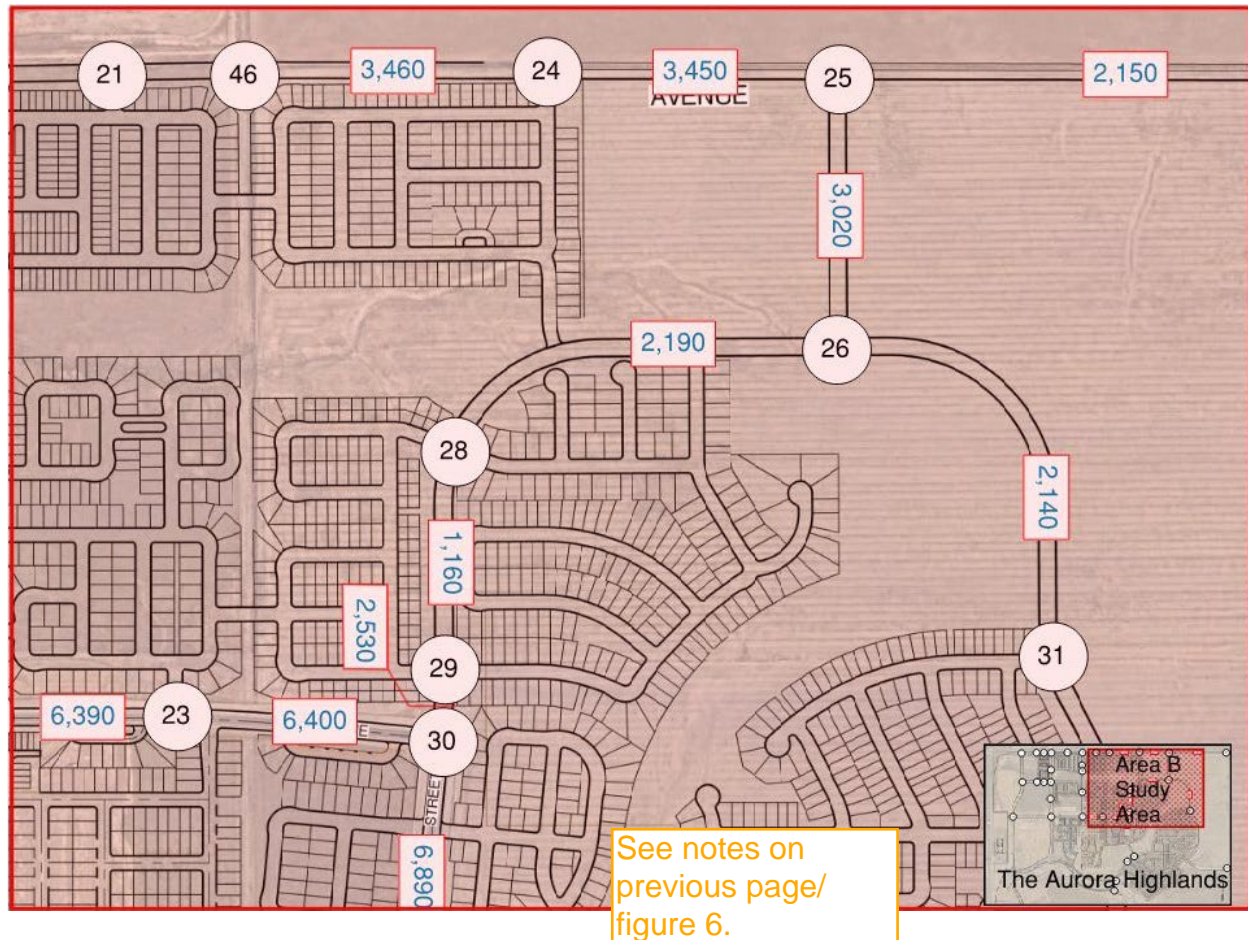


A review of these ADTs as compared to the North A TIS is also important.

It also appears that the summation of trips on the external nodes exceeds 10k ADTs, while the total trip generation for North B is ~5,900 ADT. Some clarification would be appreciated.



**Figure 7. 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.

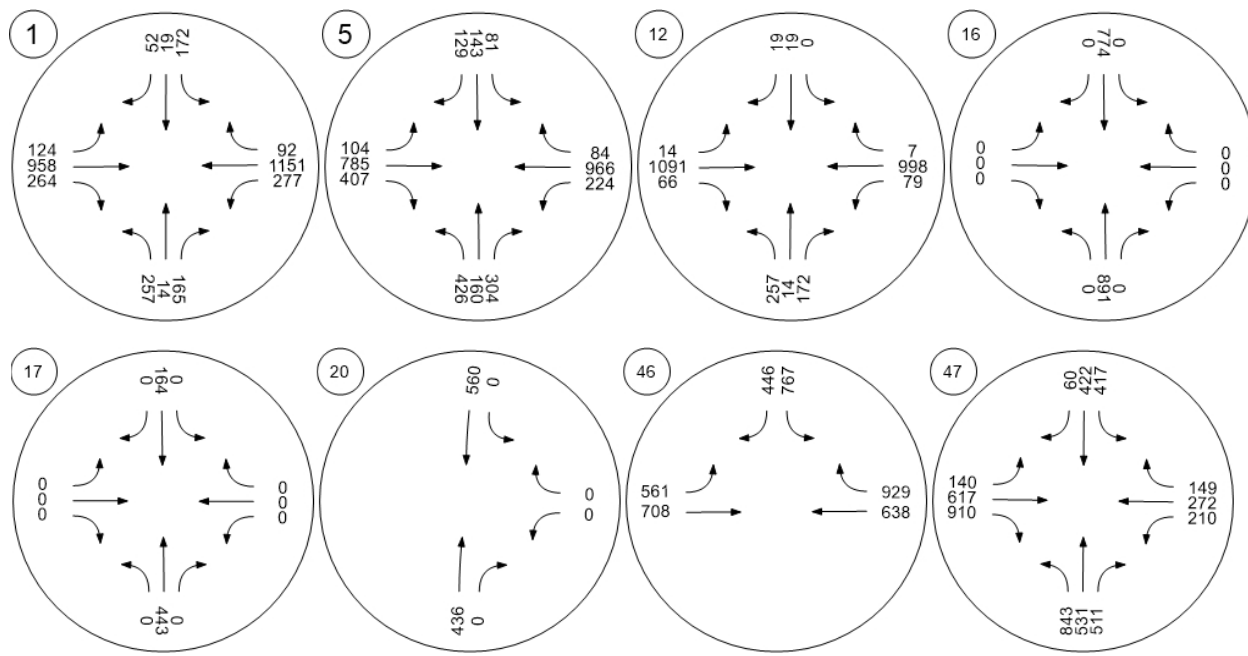
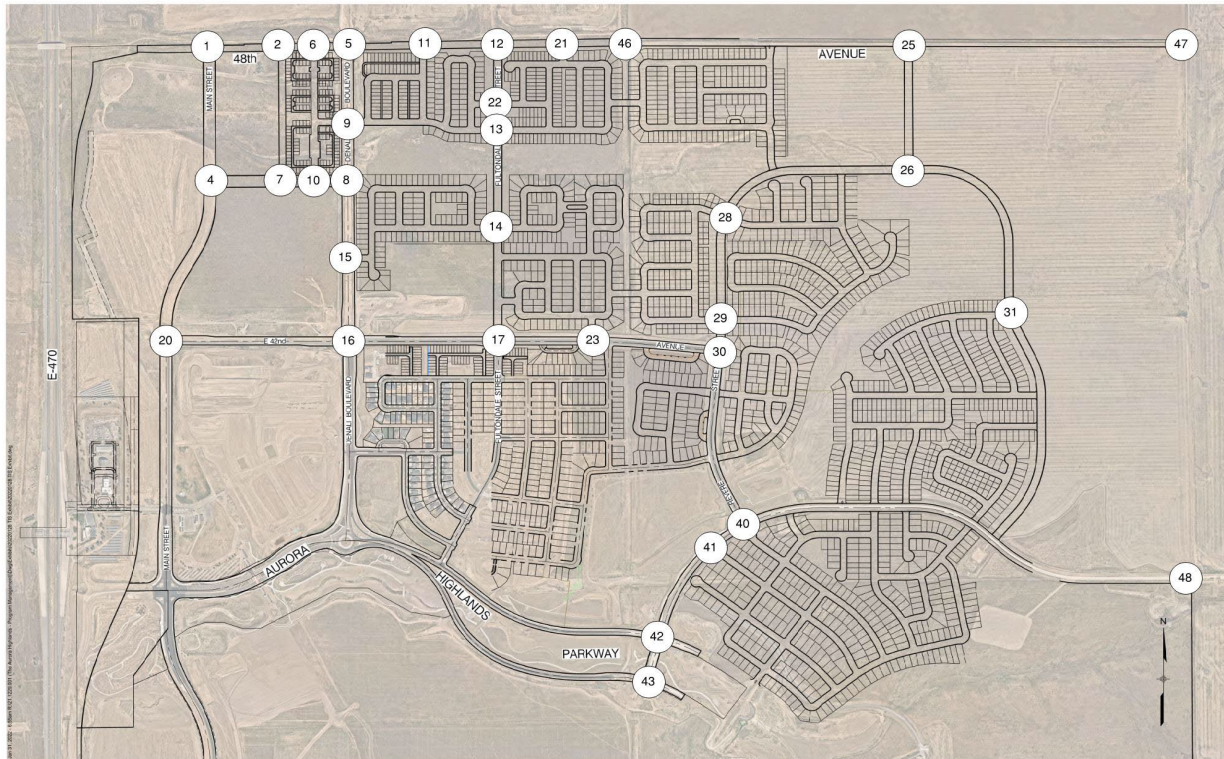
### Horizon (2040) Year No Project Conditions

The horizon year traffic volumes without the Aurora Highlands project are shown in Figures 8 and 9 and daily traffic volumes are shown in Figure 10. The background volumes along 48<sup>th</sup> Avenue and Powhaton Avenue were taken from a combination of the Windler Master Plan TIS and the ATEC TIS. Roadway and intersection configurations are taken from the Aurora Highlands TIS, Windler Master Plan TIS and ATEC TIS.

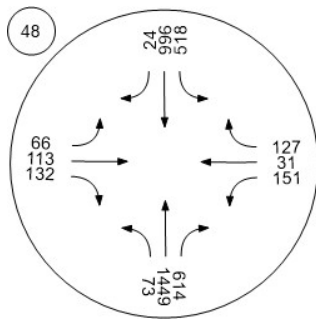
Note that wasn't made on the North A TIS because the following information wasn't available at the time:

An offsite connection from 48th/Powhaton to Jackson Gap Way is anticipated, which alleviates traffic volumes on 48th from Harvest to Powhaton, and affecting both of those intersections and their analysis. Figures indicating projected ADTs for these roads have been included at the end of this PDF, as well as attached to the email delivering these comments. A review of those volume projections and it's impacts on operational results in this TIS is appreciated.

Figure 8.

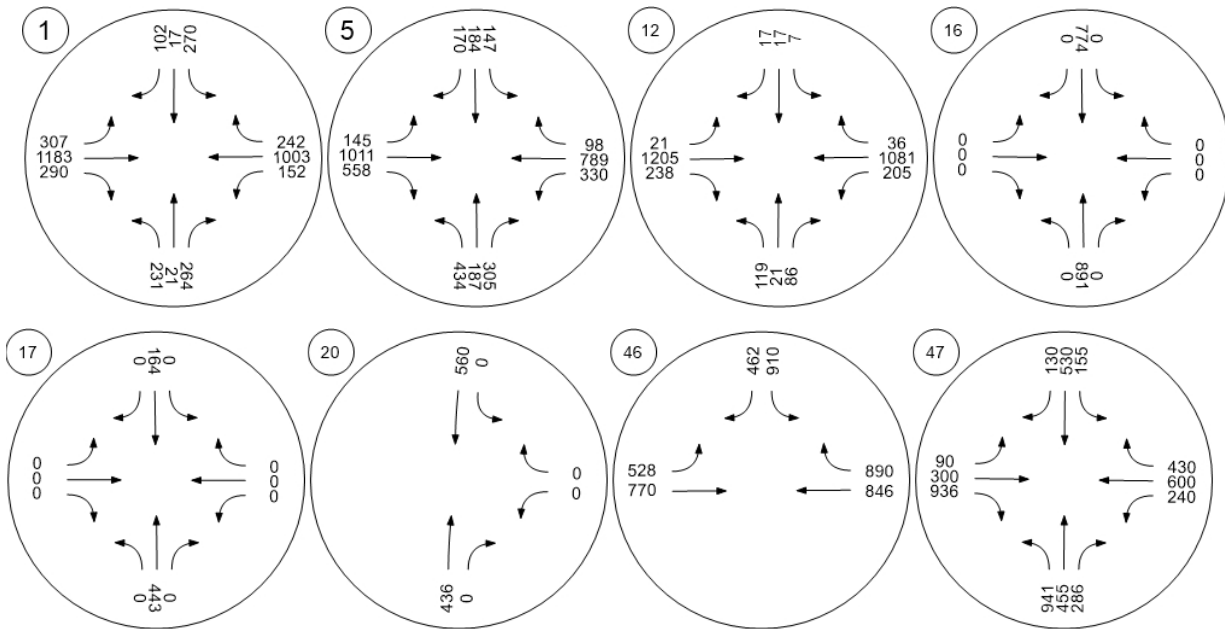
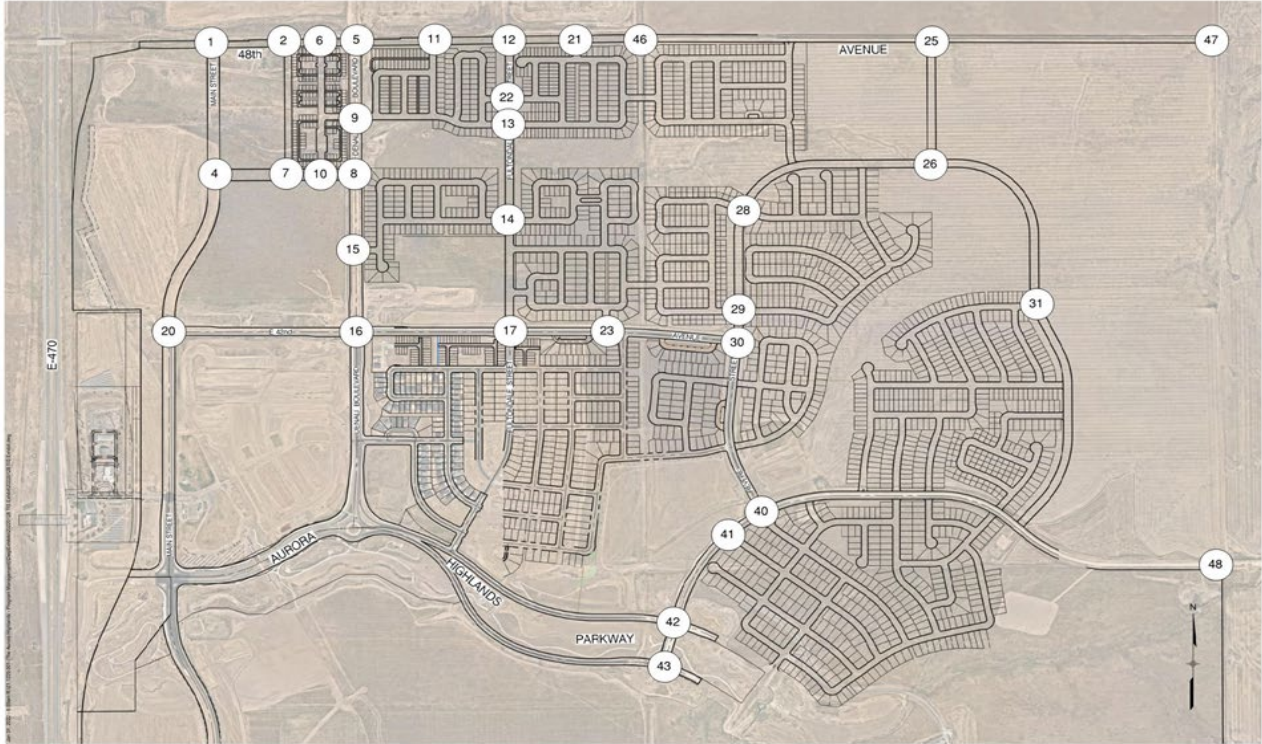


The common intersections in this and the North A study do not have volumes that agree with each other.

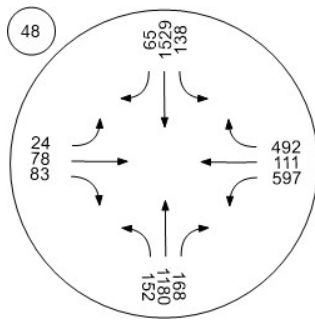




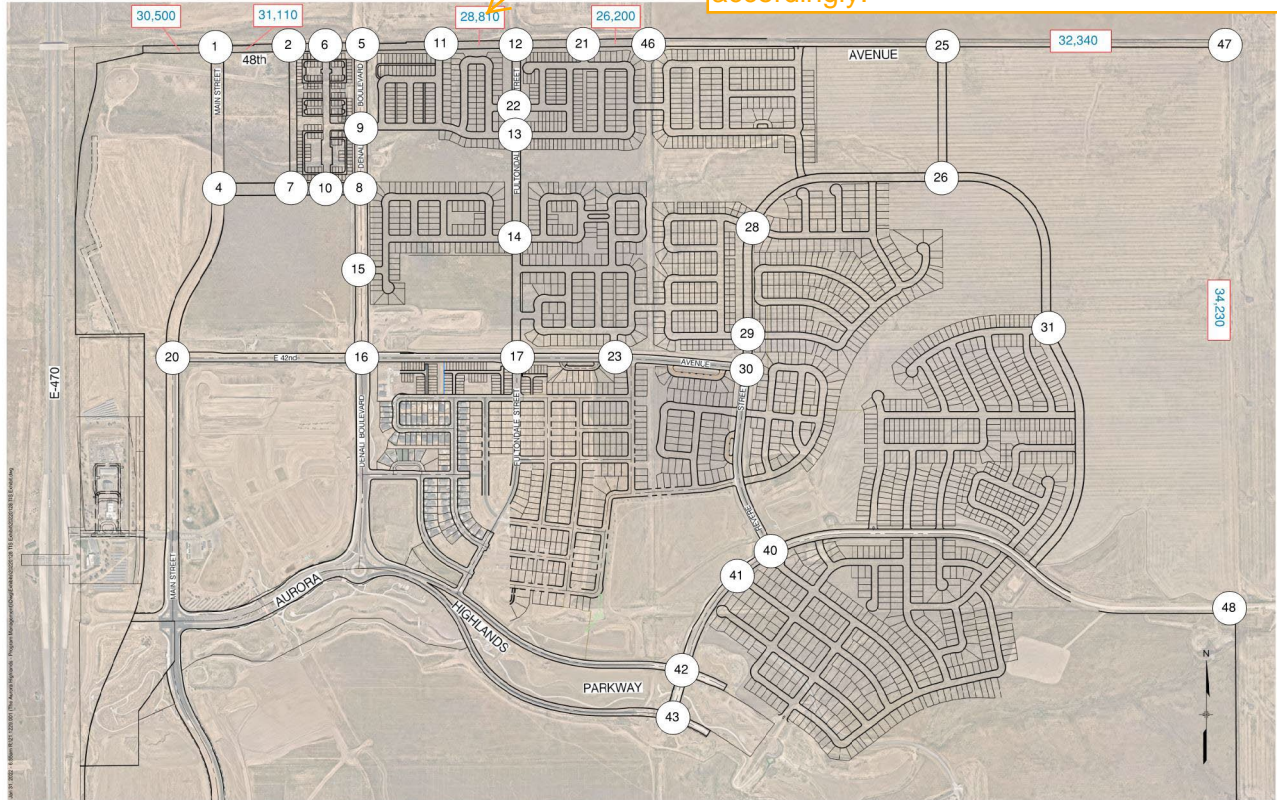
**Figure 9. Horizon Year No Project Traffic Volumes (PM Peak Hour)**



See comments  
Figure 8.



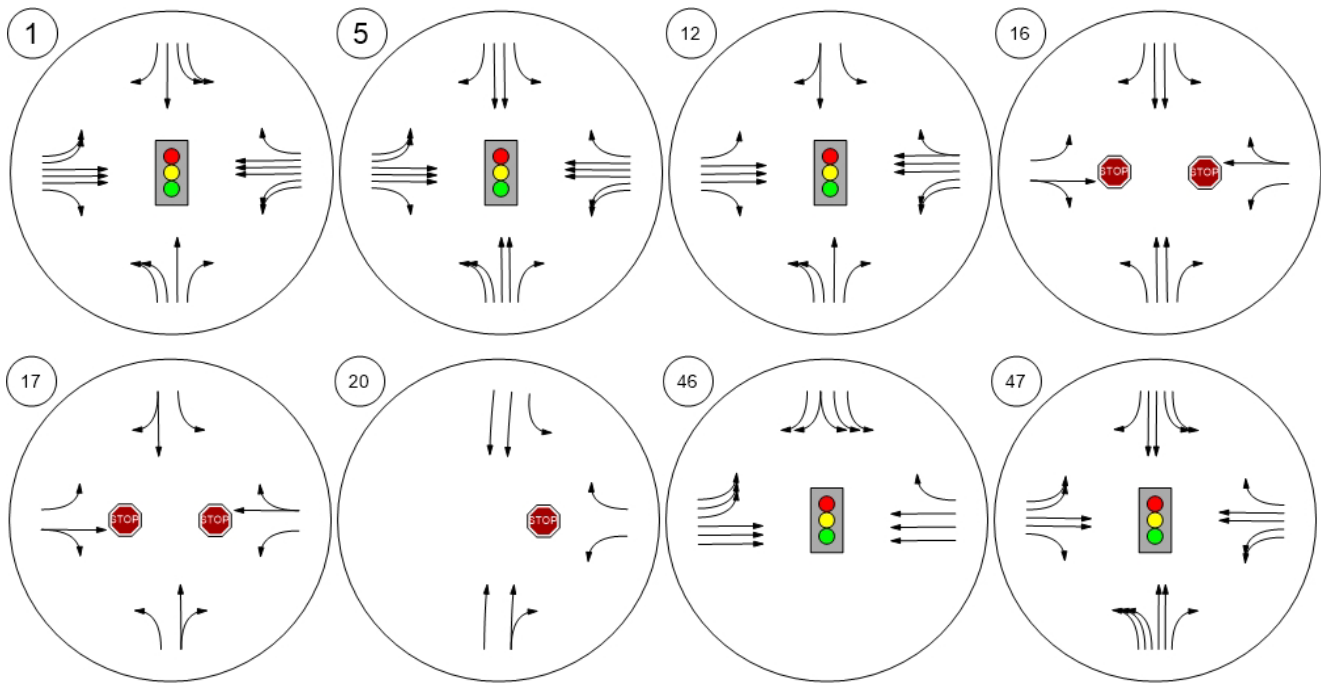
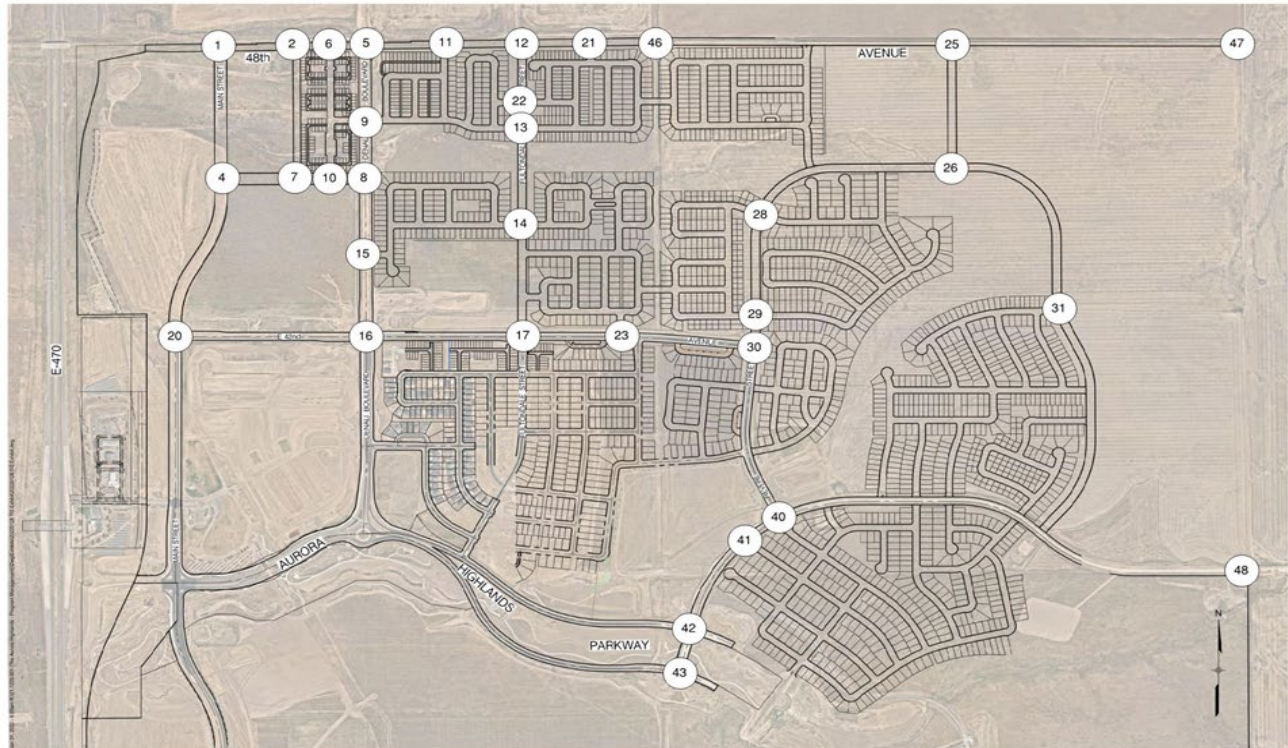
**Figure 10. Horizon No Project Daily Traffic Volume**



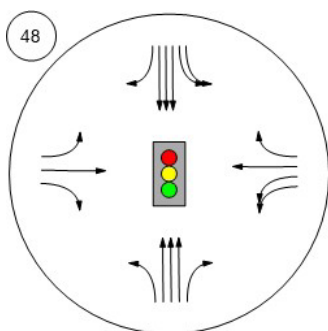
The assumed intersection configurations are shown in Figure 11. The operations of the study area intersections in the build out background (no project) scenario are shown in Tables 2 and 3.



Figure 11. Horizon No Project Intersection Configurations



Include LOS on these figures by movement.



Intersection configurations were taken from a combination of the Windler Master Plan TIS and the ATEC TIS.



**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
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	0.446	42.7	D
5	48th Avenue/Denali Boulevard	Signalized	HCM 7th Edition	EB Left	0.463	30.2	C
12	48th Avenue/Fultondale Street	Signalized	HCM 7th Edition	WB Left	0.395	15.7	B
16	42nd Avenue/Denali Boulevard	Two-way stop	HCM 7th Edition	NB Thru	0.01	0	A
17	42nd Avenue/Fultondale Street	Two-way stop	HCM 7th Edition	NB Thru	0.005	0	A
46	48th Avenue/Harvest Road	Signalized	HCM 7th Edition	EB Left	0.46	26.7	C
47	48th Avenue/Powhaton Road	Signalized	HCM 7th Edition	EB Left	0.622	46.8	D
48	38th Parkway/Powhaton Road	Signalized	HCM 7th Edition	EB Thru	0.65	26.3	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.

**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
ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	48th Avenue/Main Street	Signalized	HCM 7th Edition	WB Left	0.539	43	D
5	48th Avenue/Denali Boulevard	Signalized	HCM 7th Edition	NB Left	0.571	53.2	D
12	48th Avenue/Fultondale Street	Signalized	HCM 7th Edition	NB Left	0.416	13.5	B
16	42nd Avenue/Denali Boulevard	Two-way stop	HCM 7th Edition	NB Thru	0.01	0	A
17	42nd Avenue/Fultondale Street	Two-way stop	HCM 7th Edition	NB Thru	0.005	0	A
20	42nd Avenue/Main Street	Two-way stop	HCM 7th Edition	SB Thru	0.006	0	A
46	48th Avenue/Harvest Road	Signalized	HCM 7th Edition	EB Left	0.535	25.9	C
47	48th Avenue/Powhaton Road	Signalized	HCM 7th Edition	EB Left	0.634	46.5	D
48	38th Parkway/Powhaton Road	Signalized	HCM 7th Edition	SB Left	0.671	29.9	C

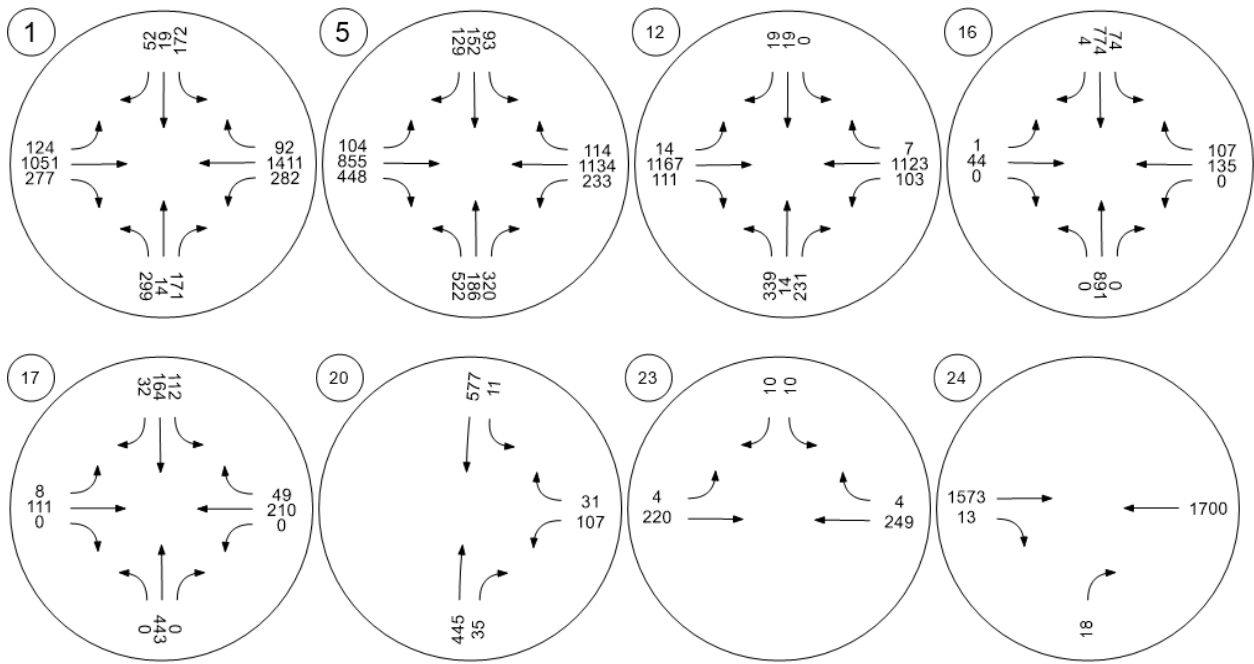
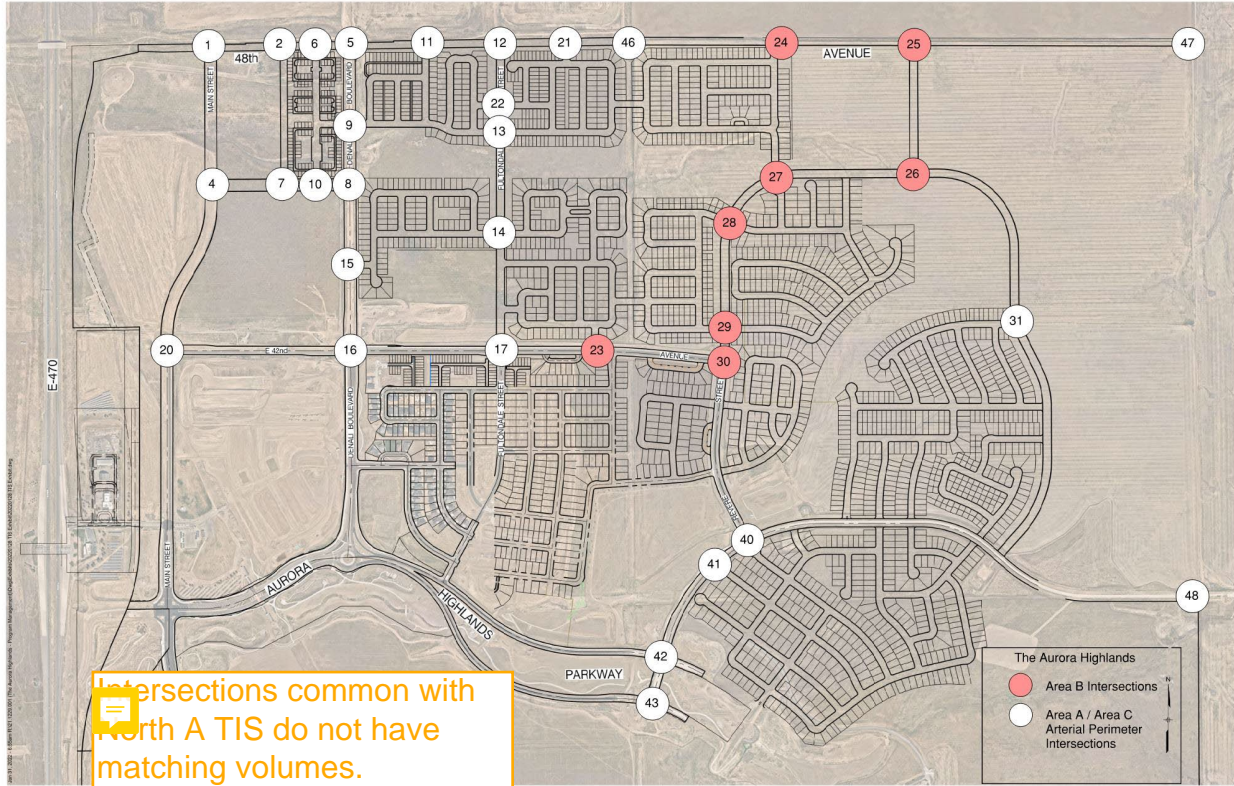
V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

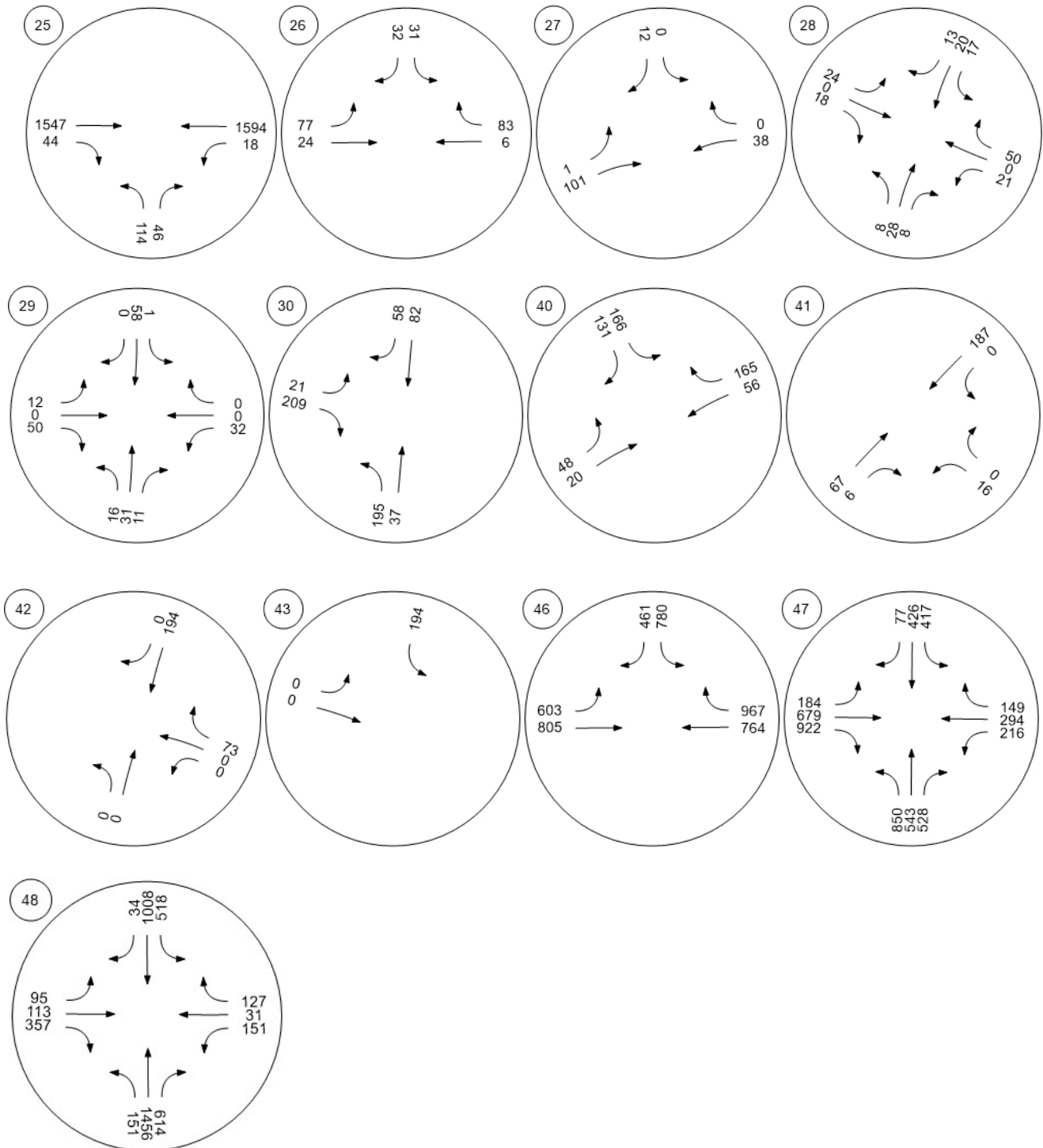
All study area intersections are projected to operate at an acceptable LOS in the horizon year without the project traffic as shown in Tables 2 and 3. Additionally, all the roadways will carry a daily volume of traffic that is consistent with the Aurora Highlands TIS from August 2019 and NEATS.

## 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.

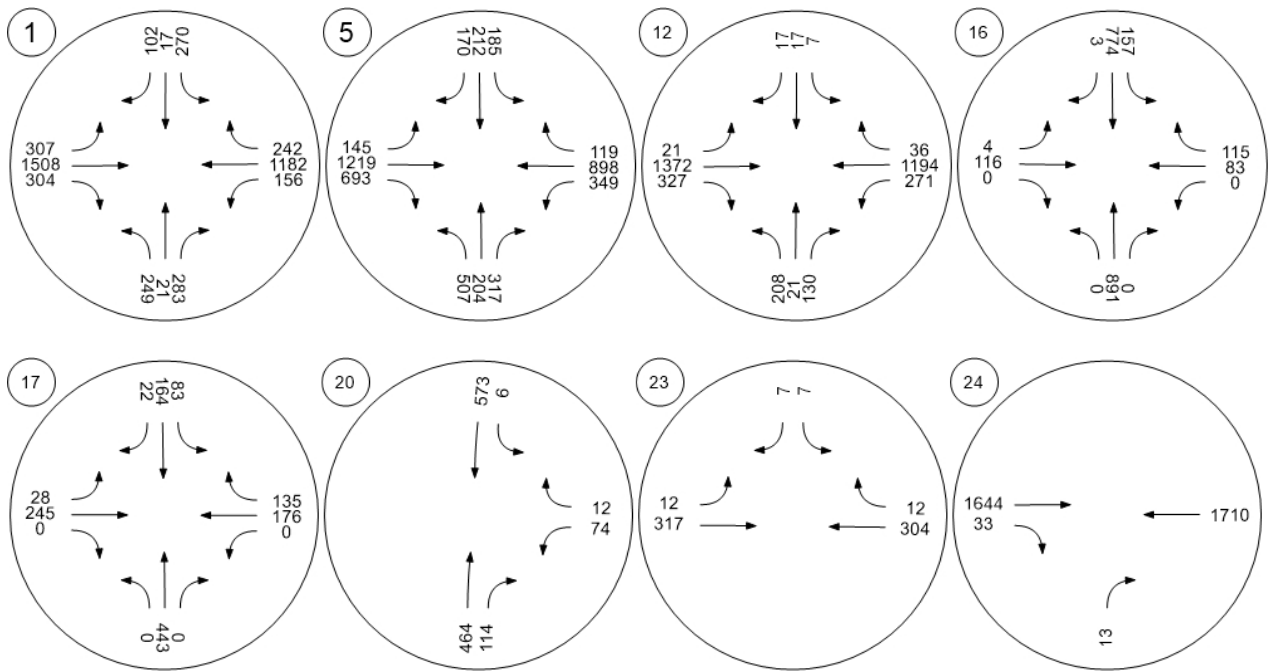
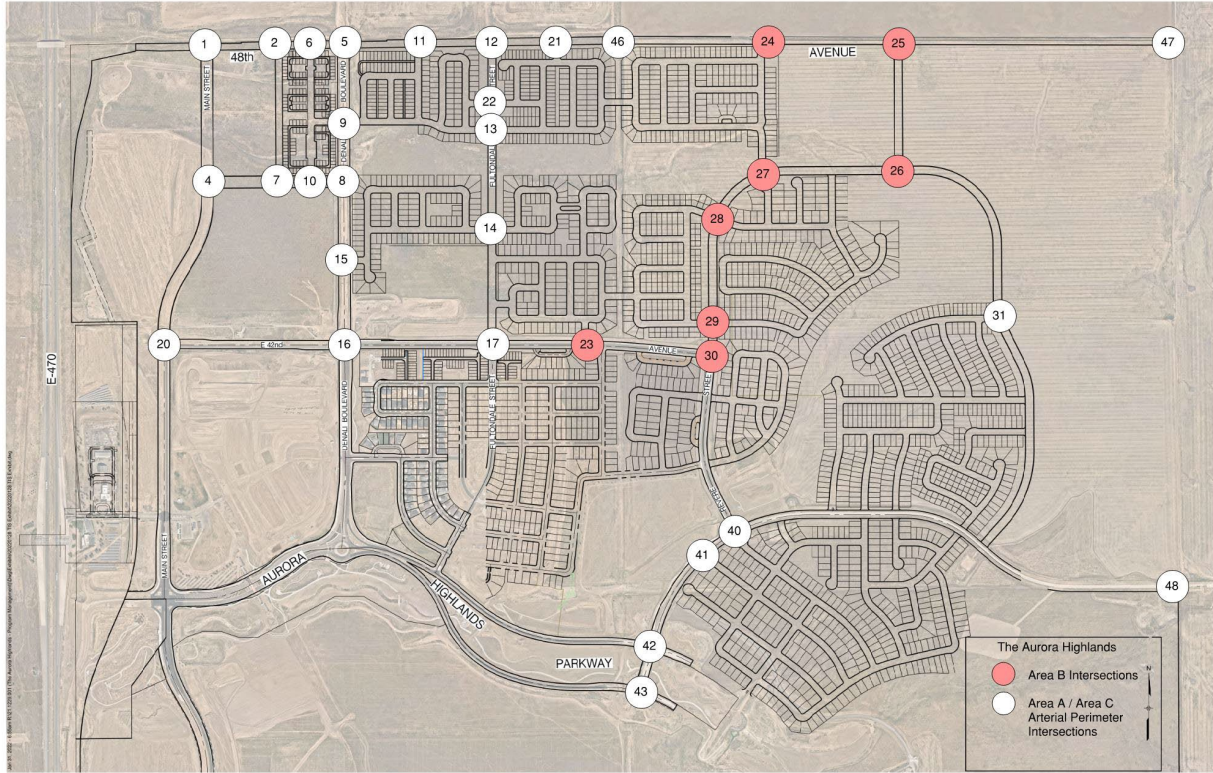
**Figure 12. Horizon Total Traffic Volumes (AM Peak Hour)**

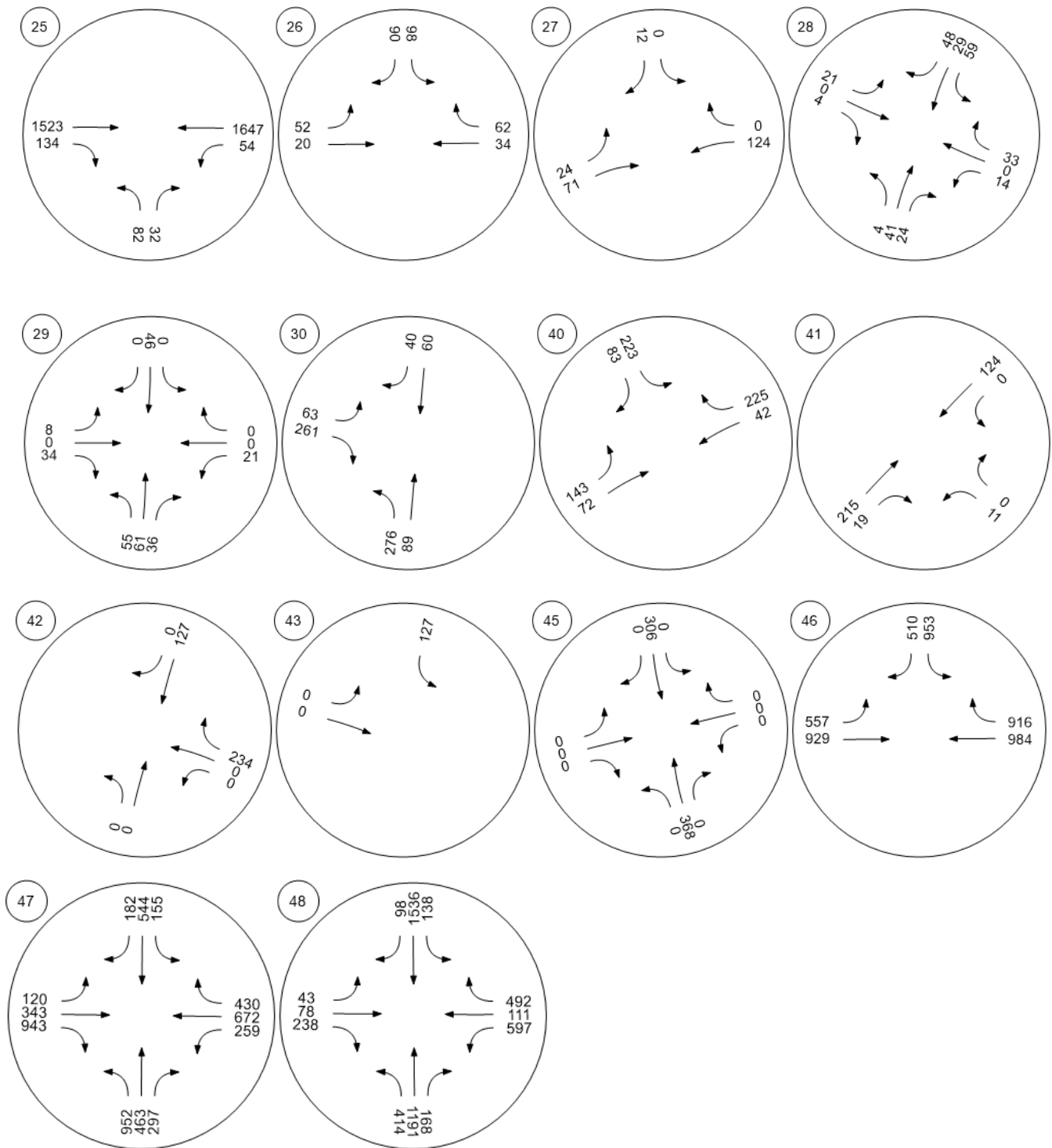




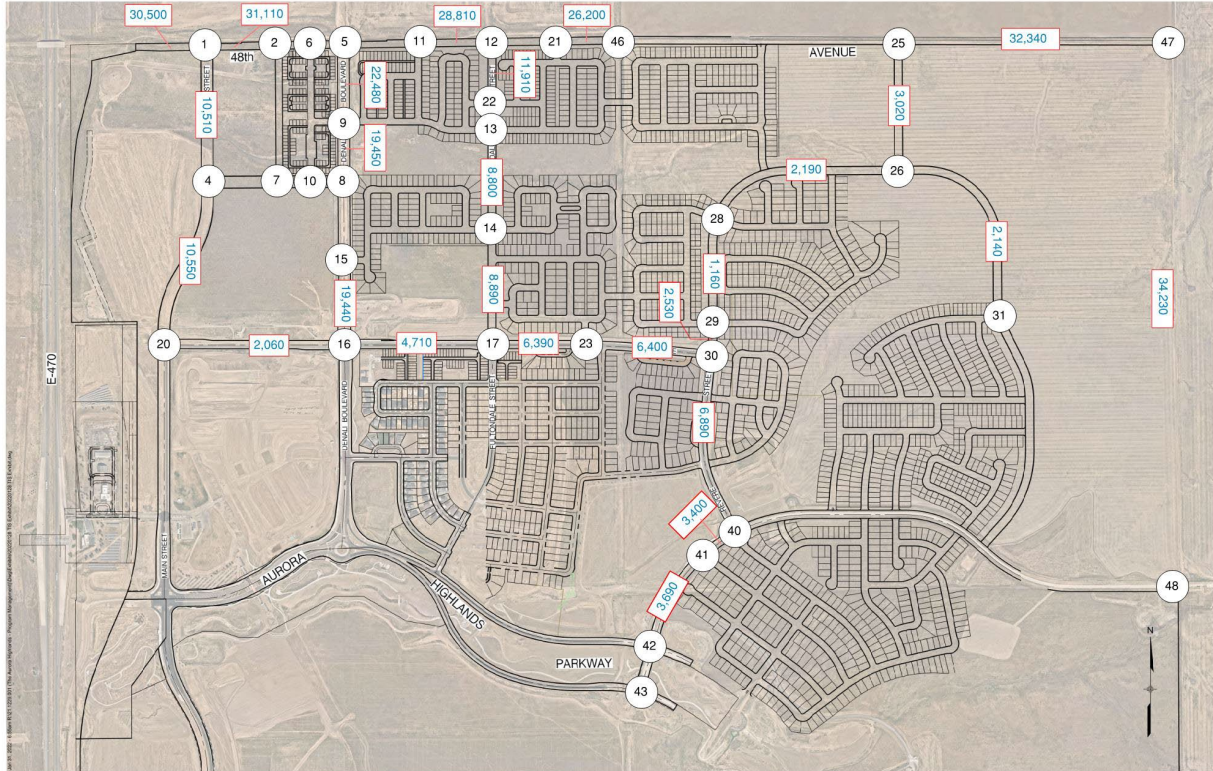


**Figure 13. Horizon With Project Traffic Volumes (PM Peak Hour)**





**Figure 14. Horizon With Project Total Daily Traffic Volumes**

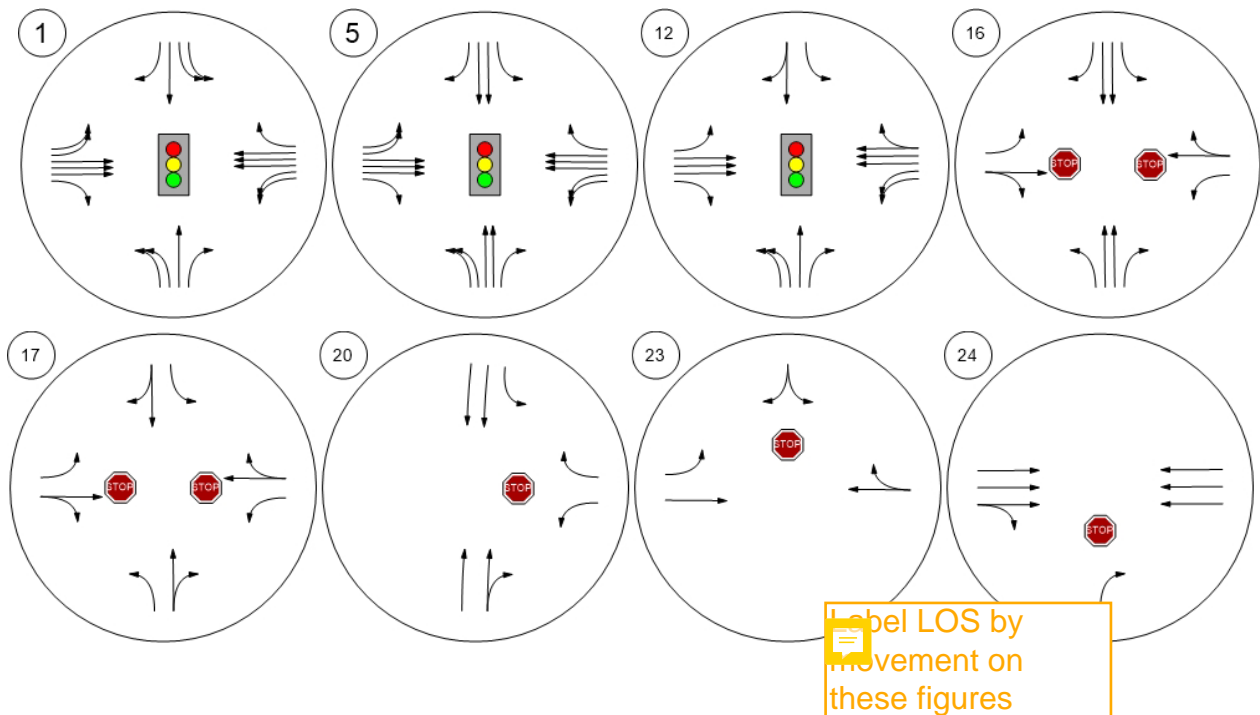
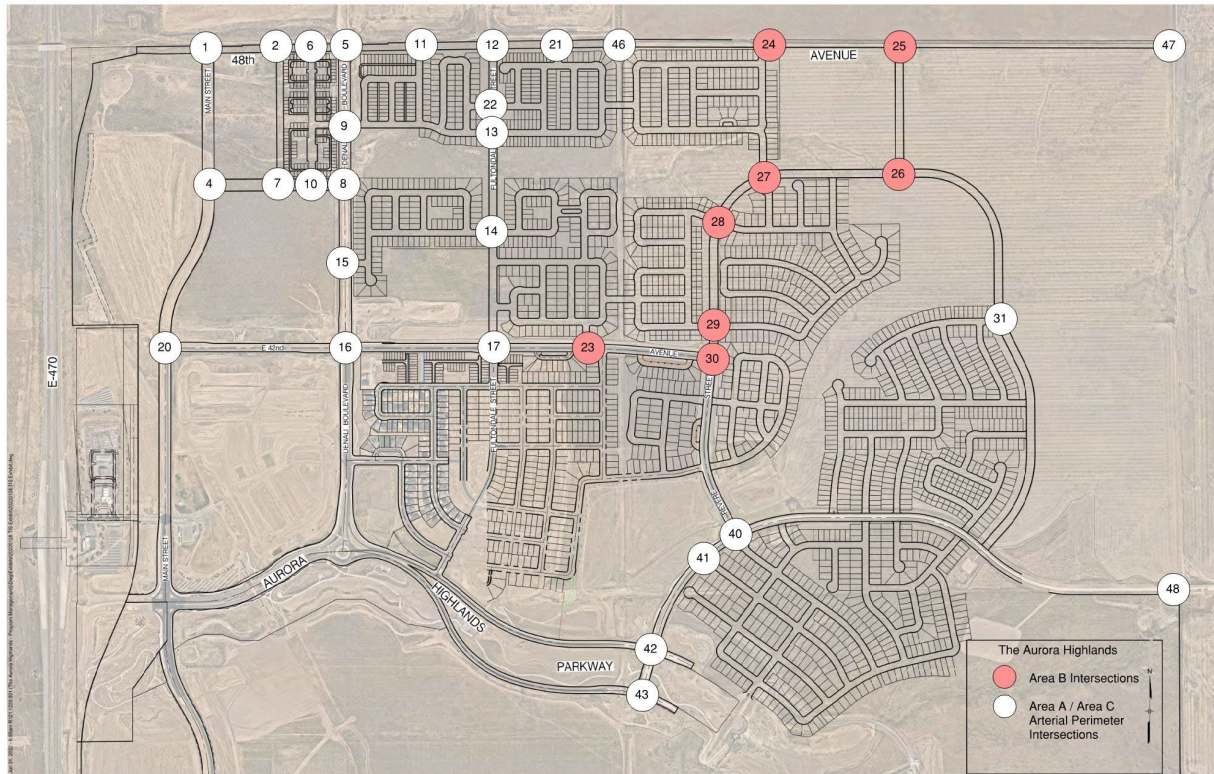


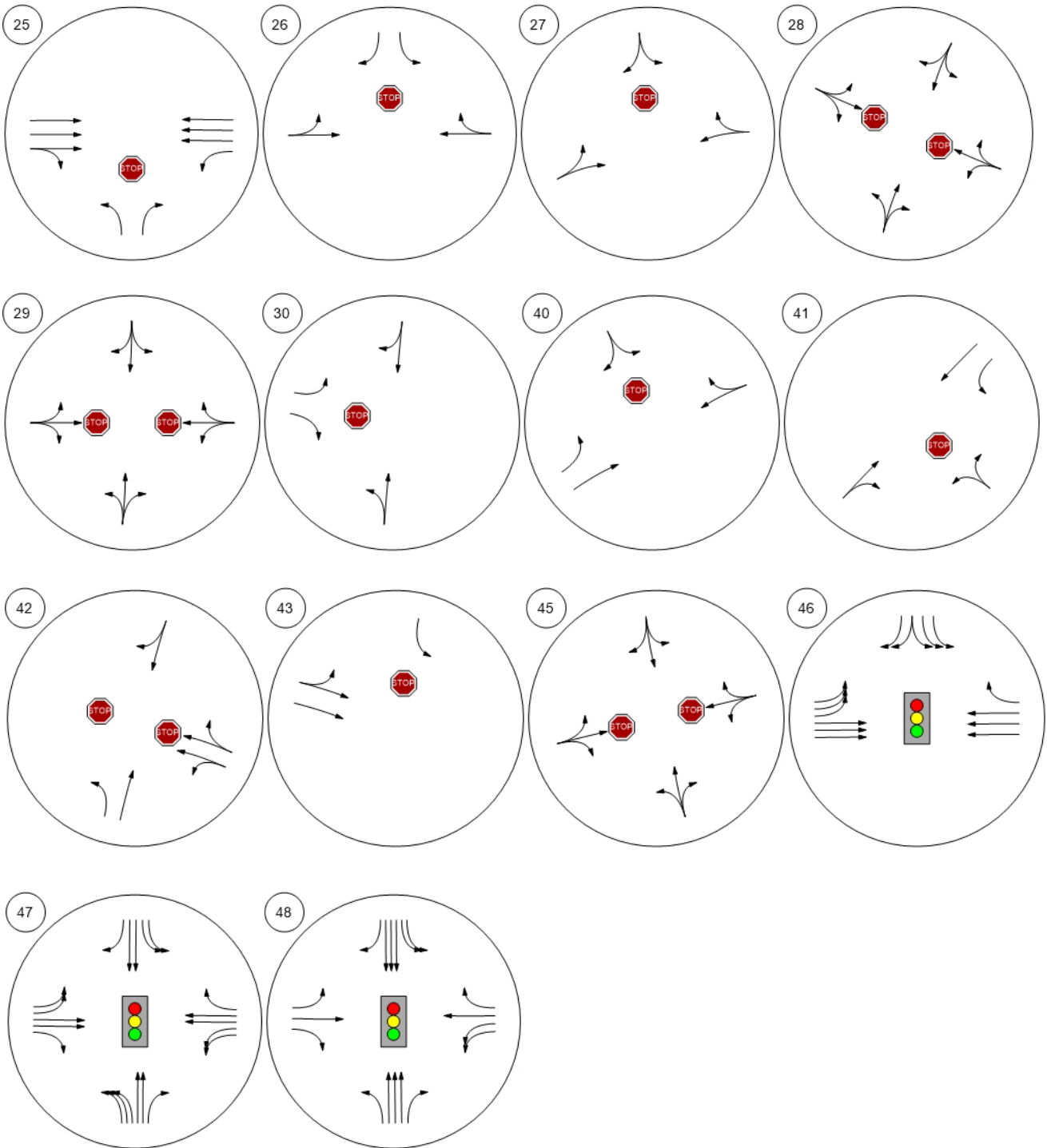
Assumed intersection configurations for the study area intersections are shown in Figure 15.

Analysis of the intersections and roadways for build out conditions with the volumes and configurations shown above results in the operations shown in Tables 4 and 5.



Figure 15. Horizon With Project Intersection Configurations









North A TIS shows 42nd/Denali as signalized (though projected warrant studies have not yet been provided to confirm)

**Table 4. Horizon Total Intersection Control**

ID	Intersection Name							
ID	Intersection Name							
1	48th Avenue/Main Street							
5	48th Avenue/Denali Boulevard	Signalized	HCM 7th Edition	NB Left	0.539	34.1	C	
12	48th Avenue/Fultondale Street	Signalized	HCM 7th Edition	NB Left	0.45	19	B	
16	42nd Avenue/Denali Boulevard	Two-way stop	HCM 7th Edition	WB Thru	2.692	988.1	F	
17	42nd Avenue/Fultondale Street	Two-way stop	HCM 7th Edition	EB Left	1.866	1,761.90	F	
20	42nd Avenue/Main Street	Two-way stop	HCM 7th Edition	WB Left	0.386	24.3	C	
23		Two-way stop	HCM 7th Edition	SB Left	0.021	12.2	B	
24		Two-way stop	HCM 7th Edition	NB Right	0.078	20.2	C	
25	48th Avenue/PA-31 Street	Two-way stop	HCM 7th Edition	NB Left	2.602	908.2	F	
26	Reserve Loop/PA-31 Street	Two-way stop	HCM 7th Edition	SB Left	0.049	10.4	B	
27		Two-way stop	HCM 7th Edition	SB Right	0.013	8.5	A	
28		Two-way stop	HCM 7th Edition	EB Left	0.034	9.9	A	
29		Two-way stop	HCM 7th Edition	WB Left	0.047	10.1	B	
30	42nd Avenue/Reserve Loop	Two-way stop	HCM 7th Edition	EB Left	0.057	14.5	B	
40	38th Parkway/Reserve Loop (W)	Two-way stop	HCM 7th Edition	SB Left	0.263	13.6	B	
41		Two-way stop	HCM 7th Edition	NB Left	0.024	10.2	B	
42	The Aurora Highlands Parkway/38th Parkway	Two-way stop	HCM 7th Edition	WB Right	0.073	8.6	A	
43	Parkway/38th Parkway	Two-way stop	Edition	SB Left	0.206	9.4	A	
46	48th Avenue/Harvest Road	Signalized	HCM 7th Edition	EB Left	0.503	28	C	
47	48th Avenue/Powhaton Road	Signalized	HCM 7th Edition	WB Left	0.652	47.7	D	
48	38th Parkway/Powhaton Road	Signalized	HCM 7th Edition	WB Left	0.714	30.5	C	

Operation analysis at 42nd/Fultondale yields much worse operation in this study than North A. Does this warrant signalization? If suspected, provide warrant analysis. With proximity to school, we need to make sure to get this intersection correct.

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.

Given operations here and the spacing between this access and Harvest and Powhaton, let's evaluate a warrant study for this access.

**Table 5. Horizon Total 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	WB Left	0.613	45.4	D
5	48th Avenue/Denali Boulevard	Signalized	HCM 7th Edition	EB Left	0.66	44	D
12	48th Avenue/Fultondale Street	Signalized	HCM 7th Edition	NB Left	0.51	26.3	C
16	42nd Avenue/Denali Boulevard	Two-way stop	HCM 7th Edition	EB Thru	3.497	1,354.60	F
17	42nd Avenue/Fultondale Street	Two-way stop	HCM 7th Edition	EB Left	0.669	183.00	F
20	42nd Avenue/Main Street	Two-way stop	HCM 7th Edition	WB Left	0.286	23	C
23		Two-way stop	HCM 7th Edition	SB Left	0.02	14.3	B
24		Two-way stop	HCM 7th Edition	NB Right	0.059	21.1	C
25	48th Avenue/PA-31 Street	Two-way stop	HCM 7th Edition	NB Left	3.082	1,224.60	F
26	Reserve Loop/PA-31 Street	Two-way stop	HCM 7th Edition	SB Left	0.142	10.6	B
27		Two-way stop	HCM 7th Edition	SB Right	0.014	9	A
28		Two-way stop	HCM 7th Edition	EB Left	0.037	11	B
29		Two-way stop	HCM 7th Edition	WB Left	0.037	11	B
30	42nd Avenue/Reserve Loop	Two-way stop	HCM 7th Edition	EB Left	0.239	21.6	C
40	38th Parkway/Reserve Loop (W)	Two-way stop	HCM 7th Edition	SB Left	0.56	26.4	D
41		Two-way stop	HCM 7th Edition	NB Left	0.019	10.9	B
42	The Aurora Highlands Parkway/38th Parkway	Two-way stop	HCM 7th Edition	WB Right	0.234	9.3	A
43	Parkway/38th Parkway	Two-way stop	Edition	SB Left	0.135	9.1	A
46	48th Avenue/Harvest Road	Signalized	HCM 7th Edition	EB Left	0.585	25.9	C
47	48th Avenue/Powhatan Road	Signalized	HCM 7th Edition	EB Left	0.676	47.6	D
48	38th Parkway/Powhatan Road	Signalized	HCM 7th Edition	NB Left	0.827	52	D

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.

The deficient intersections (intersections that operate at LOS E. or LOS F) are stop-controlled. At these intersections, the LOS of the worst stop-controlled movement becomes the LOS of the intersection. Often, these intersections will still operate fine if the queue for the deficient movement(s) are not very long. The following intersections will operate LOS F during the AM or PM peak hours with the project:

**Intersection 16 – 42<sup>nd</sup> Avenue /Denali Boulevard-** This intersection operates at LOS F during both AM and PM peak hours. This intersection is projected to meet the following MUTCD traffic signal warrants by the horizon year with the addition of project traffic:

- Eight-Hour Vehicular Volume
- Four-Hour Vehicular Volume
- Peak Hour

Provide warrant study worksheets (for Horizon year buildout) for these intersections that are recommended to be signalized.

It is recommended that a traffic signal be installed at this intersection by the completion Area B because MUTCD warrants are met. With a traffic signal installed, the intersection will operate at LOS A during the AM peak and PM peak hours

Understood. Is there a pedestrian crossing warrant (Warrant 4) or school crossing (Warrant 5) that could be applicable?

**Intersection 17 – 42<sup>nd</sup> Avenue/Fultondale Street-** This intersection operates at LOS F during both AM and PM peak hours. The deficient movement is eastbound left turn. The queue length is less than 3 vehicles during the peak hours. Since only peak hour warrant was met during the analyses, City of Aurora should monitor the additional warrants to be met prior to install a new traffic signal.

**Intersection 25 – 48<sup>th</sup> Avenue/PA-31 Street–** this intersection operates at LOS F during both the AM and PM peak hours. This intersection is projected to meet the following MUTCD traffic signal warrants by the horizon year with the addition of project traffic:

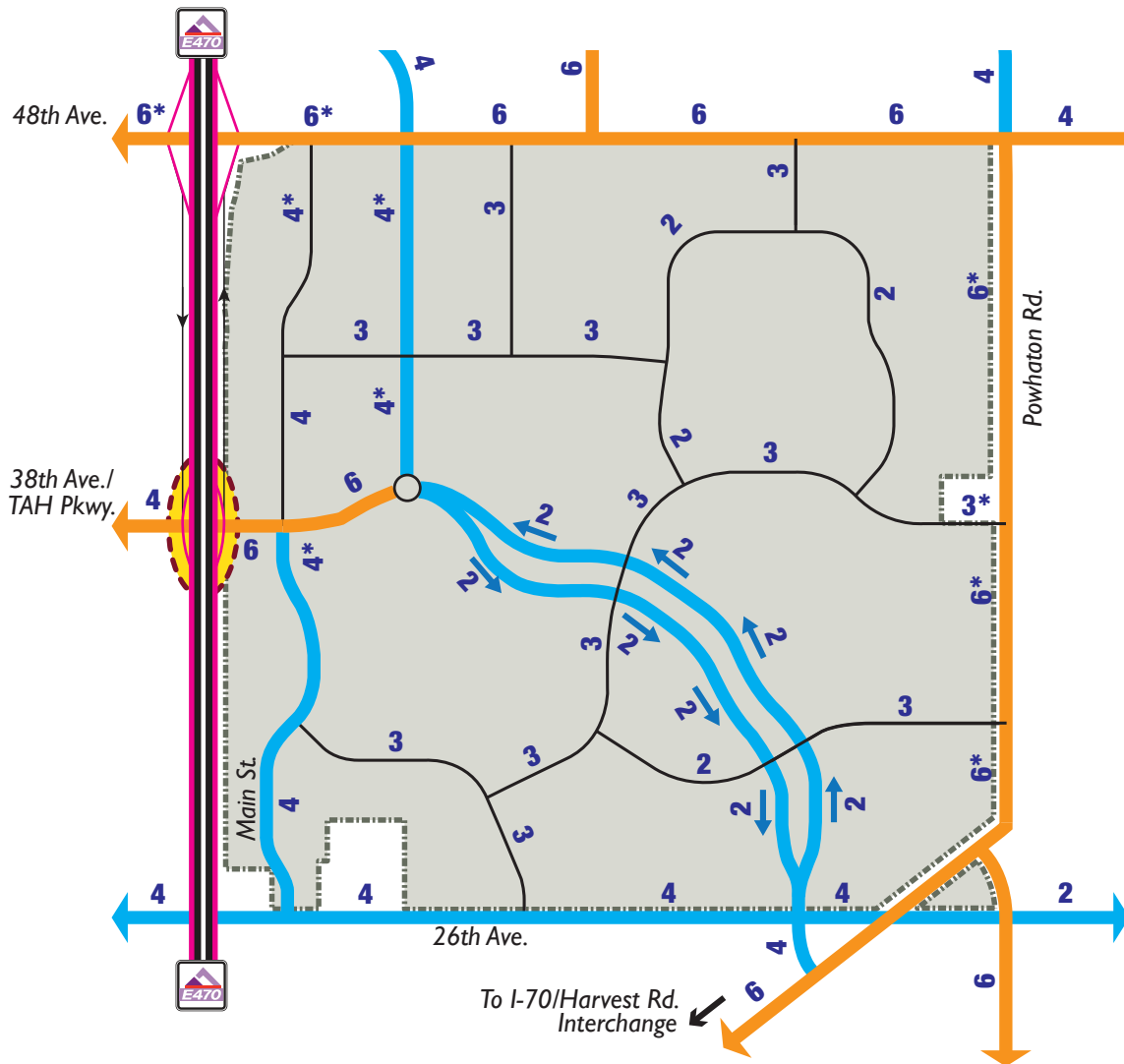
- Eight-Hour Vehicular Volume
- Four-Hour Vehicular Volume
- Peak Hour

It is recommended that a traffic signal be installed at this intersection by the completion of Area B because MUTCD warrants are met. With a traffic signal installed, the intersection will operate at LOS A during the AM peak and PM peak hours.

## 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*. These studies were used to assume the 2040 roadway network, intersection configurations and 2040 background traffic volumes in the study area. The new project trips for The Aurora Highlands, North Area, Area B were generated using the *ITE Trip Generation Manual, 11<sup>th</sup> Edition*, distributed to the roadway network following the trip distribution assumptions from the other area studies and assigned to the roadway network. When the 2040 roadway network was analyzed with the addition of project traffic, two intersections require mitigation. Intersection 25 – 48<sup>th</sup> Avenue/PA-31 Street and intersection 16- 42<sup>nd</sup> Avenue/Denali Boulevard will both require the installation of a traffic signal.

## **Appendix A – Background Traffic Volumes**



#### LEGEND

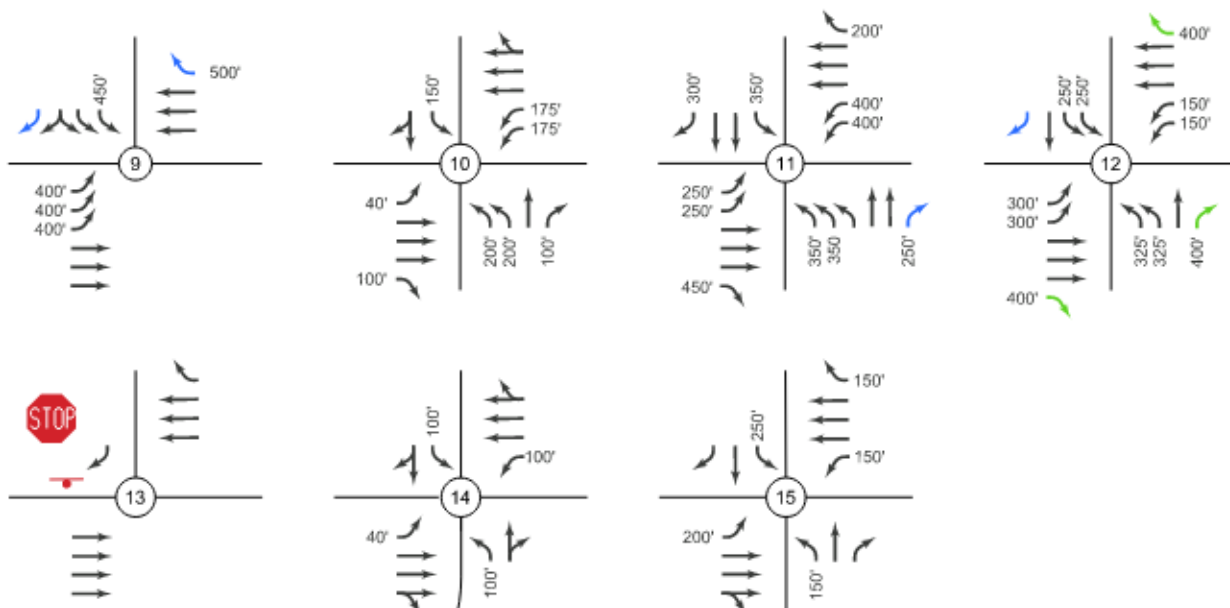
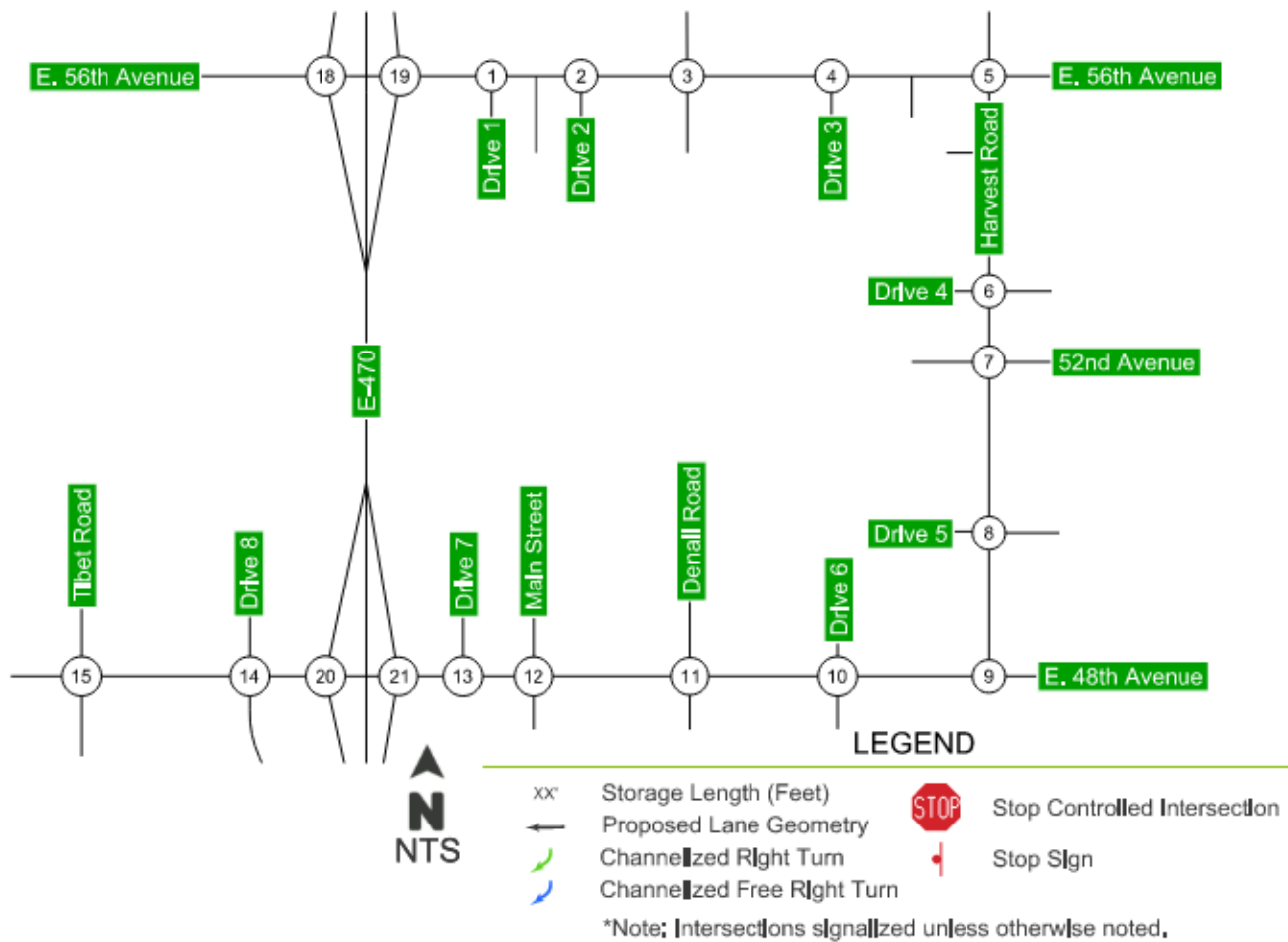
	= Tollway		= Divided Minor Arterial
	= Major Arterial		= Laneage
	= Minor Arterial		= Accel/Decel Lanes also Needed
	= Collector Roads (Subject to traffic calming measures at time of contextual site plan)		= Aurora Highlands
	= Potential Interchange		

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



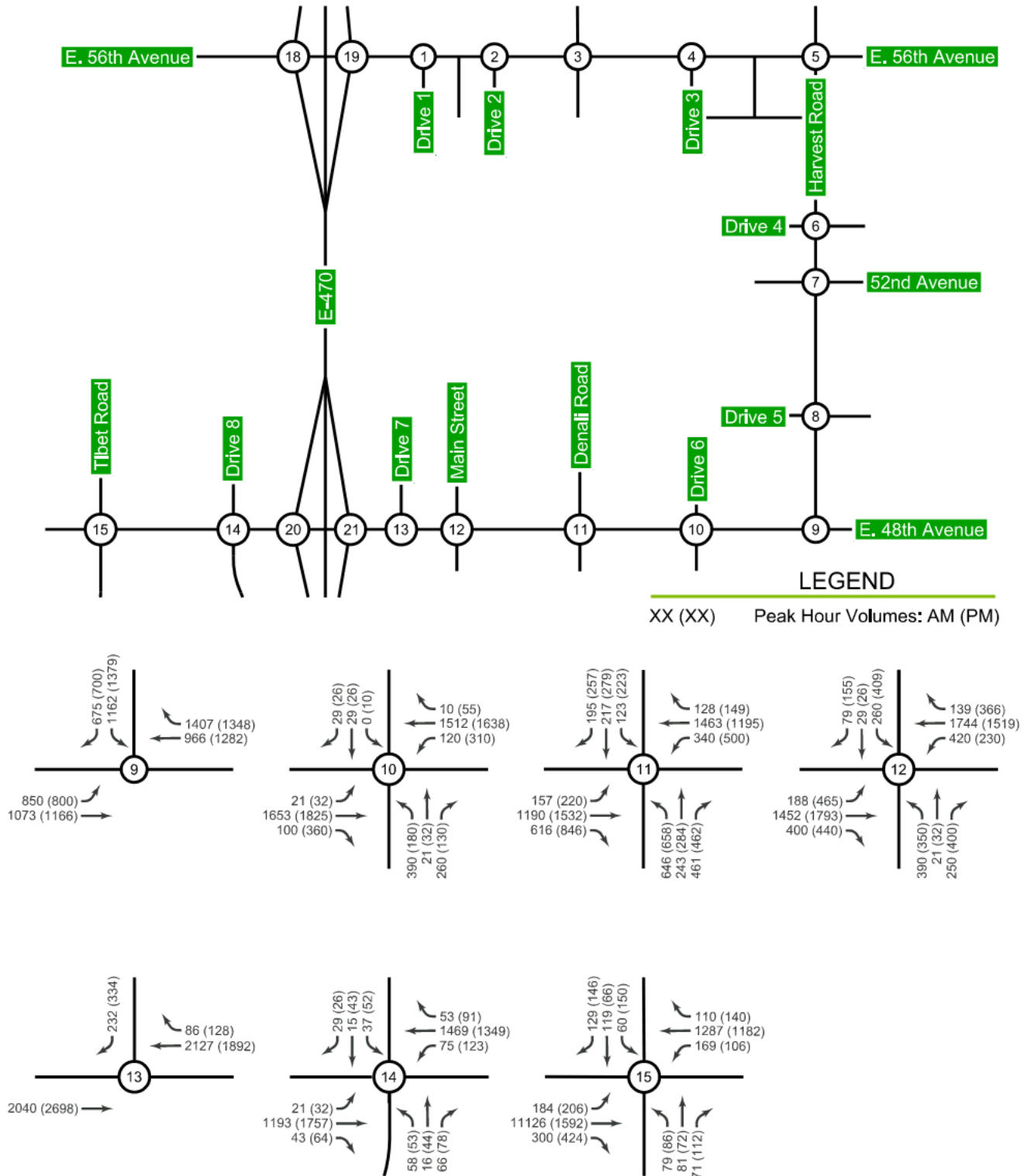
## FIGURE 5

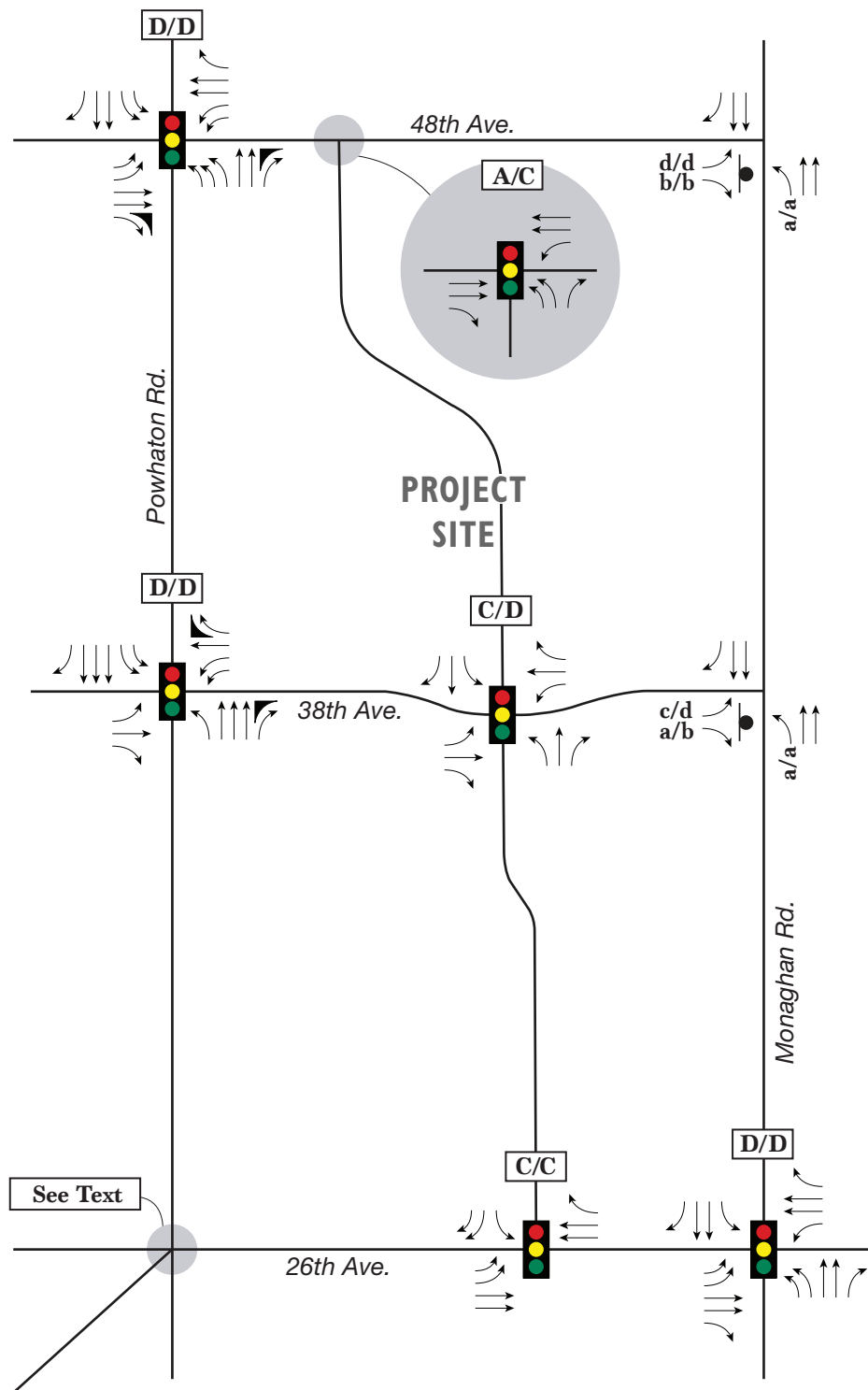
### Proposed 2040 Geometry - II



## 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





## **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):	42.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.446

#### Intersection Setup

Name	Main 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 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	2	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	325.00	100.00	400.00	250.00	100.00	250.00	300.00	100.00	400.00	150.00	100.00	400.00
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	400.00	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	Main Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	390	21	250	260	29	79	188	1452	400	420	1744	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	83	0	0	52	0	0	132	0	0	46
Total Hourly Volume [veh/h]	257	14	82	172	19	0	124	958	132	277	1151	46
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	4	22	47	5	0	34	260	36	75	313	13
Total Analysis Volume [veh/h]	279	15	89	187	21	0	135	1041	143	301	1251	50
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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	43	0	16	43	0	13	30	0	21	38	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]	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	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	45	45	9	42	42	7	28	28	13	34	34
g / C, Green / Cycle	0.11	0.41	0.41	0.08	0.38	0.38	0.06	0.25	0.25	0.12	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.09	0.01	0.06	0.06	0.01	0.00	0.04	0.23	0.10	0.10	0.27	0.03
s, saturation flow rate [veh/h]	3113	1683	1431	3113	1683	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	333	684	582	246	637	541	191	1156	361	364	1411	440
d1, Uniform Delay [s]	48.21	19.56	20.67	49.68	21.53	0.00	50.72	39.83	34.20	47.53	36.27	27.33
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
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]	5.57	0.06	0.56	4.81	0.10	0.00	4.79	2.86	0.71	4.83	2.07	0.11
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	0.84	0.02	0.15	0.76	0.03	0.00	0.71	0.90	0.40	0.83	0.89	0.11
d, Delay for Lane Group [s/veh]	53.78	19.62	21.23	54.49	21.63	0.00	55.51	42.68	34.91	52.36	38.34	27.44
Lane Group LOS	D	B	C	D	C	A	E	D	C	D	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.00	0.24	1.54	2.68	0.36	0.00	1.95	9.26	3.24	4.26	10.74	0.96
50th-Percentile Queue Length [ft/ln]	100.00	6.05	38.46	66.98	9.00	0.00	48.73	231.59	81.02	106.58	268.40	23.98
95th-Percentile Queue Length [veh/ln]	7.20	0.44	2.77	4.82	0.65	0.00	3.51	14.26	5.83	7.65	16.11	1.73
95th-Percentile Queue Length [ft/ln]	180.00	10.90	69.22	120.56	16.19	0.00	87.71	356.38	145.84	191.24	402.74	43.17

**Movement, Approach, & Intersection Results**

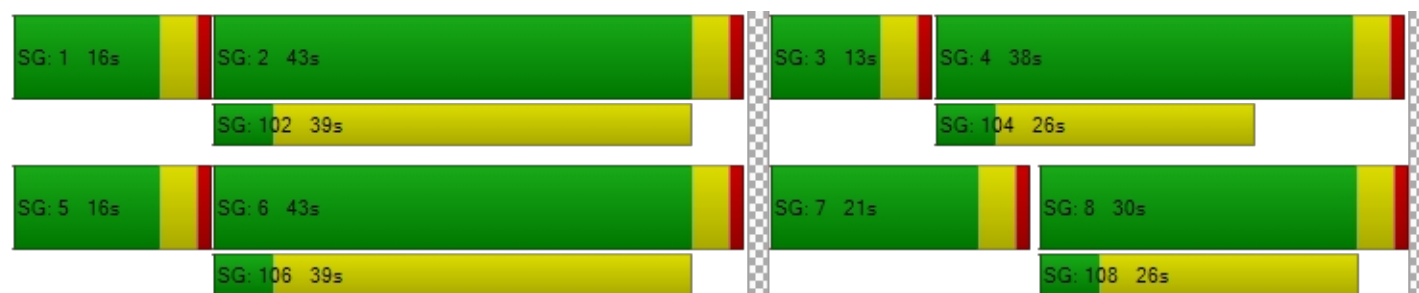
d_M, Delay for Movement [s/veh]	53.78	19.62	21.23	54.49	21.63	0.00	55.51	42.68	34.91	52.36	38.34	27.44
Movement LOS	D	B	C	D	C	A	E	D	C	D	D	C
d_A, Approach Delay [s/veh]	44.88			51.17			43.15			40.63		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	42.67											
Intersection LOS	D											
Intersection V/C	0.446											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	2.755	2.620	3.461	3.256
Crosswalk LOS	C	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]	709	709	473	618
d_b, Bicycle Delay [s]	22.94	22.94	32.10	26.28
I_b,int, Bicycle LOS Score for Intersection	2.329	1.989	2.358	2.466
Bicycle LOS	B	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):	30.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.463

**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]	350.00	100.00	250.00	350.00	100.00	300.00	250.00	100.00	450.00	400.00	100.00	200.00
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	100.00	0.00	0.00	300.00
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			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	646	243	461	123	217	195	157	1190	616	340	1463	128
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	304	0	0	65	0	0	204	0	0	42
Total Hourly Volume [veh/h]	426	160	0	81	143	64	104	785	203	224	966	42
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	116	43	0	22	39	17	28	213	55	61	263	11
Total Analysis Volume [veh/h]	463	174	0	88	155	70	113	853	221	243	1050	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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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]	120
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	Protect	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	23	57	0	9	43	0	24	36	0	18	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]	120	120	120	120	120	120	120	120	120	120	120	120
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]	19	24	24	33	10	10	6	64	64	11	69	69
g / C, Green / Cycle	0.16	0.20	0.20	0.28	0.08	0.08	0.05	0.53	0.53	0.10	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.15	0.05	0.00	0.07	0.05	0.05	0.04	0.19	0.15	0.08	0.23	0.03
s, saturation flow rate [veh/h]	3113	3204	1431	1199	3204	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	494	641	286	368	269	120	166	2425	757	297	2617	816
d1, Uniform Delay [s]	49.92	40.62	0.00	33.44	52.94	52.97	55.81	16.37	15.76	53.29	14.35	11.43
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]	8.99	0.23	0.00	0.33	1.95	4.43	4.78	0.40	0.98	5.54	0.46	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	0.94	0.27	0.00	0.24	0.58	0.58	0.68	0.35	0.29	0.82	0.40	0.06
d, Delay for Lane Group [s/veh]	58.91	40.85	0.00	33.77	54.89	57.40	60.58	16.77	16.74	58.83	14.81	11.56
Lane Group LOS	E	D	A	C	D	E	E	B	B	E	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.46	2.21	0.00	2.01	2.33	2.18	1.79	4.56	3.55	3.82	5.29	0.57
50th-Percentile Queue Length [ft/ln]	186.56	55.22	0.00	50.37	58.16	54.61	44.81	114.06	88.80	95.61	132.21	14.30
95th-Percentile Queue Length [veh/ln]	11.94	3.98	0.00	3.63	4.19	3.93	3.23	8.07	6.39	6.88	9.06	1.03
95th-Percentile Queue Length [ft/ln]	298.57	99.39	0.00	90.67	104.68	98.29	80.65	201.64	159.83	172.10	226.49	25.73

**Movement, Approach, & Intersection Results**

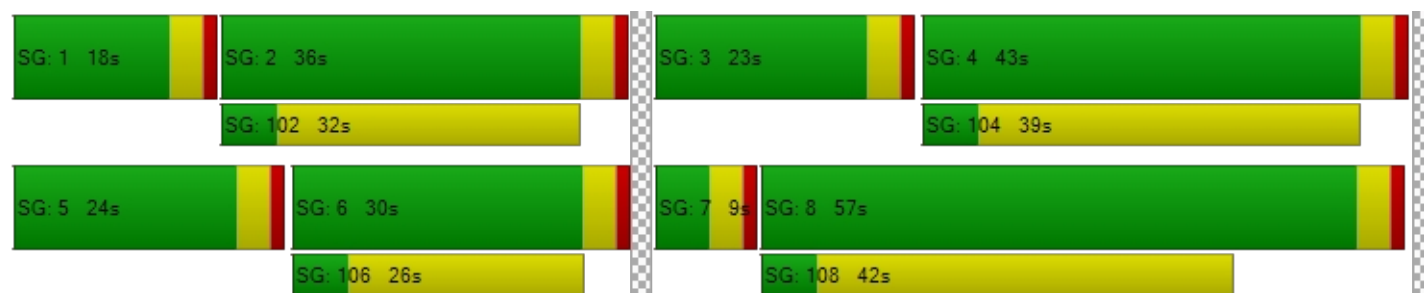
d_M, Delay for Movement [s/veh]	58.91	40.85	0.00	33.77	54.89	57.40	60.58	16.77	16.74	58.83	14.81	11.56
Movement LOS	E	D	A	C	D	E	E	B	B	E	B	B
d_A, Approach Delay [s/veh]	53.98			49.52			20.94			22.68		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	30.24											
Intersection LOS	C											
Intersection V/C	0.463											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	51.35	51.35	51.35	51.35
I_p,int, Pedestrian LOS Score for Intersection	3.287	2.683	3.484	3.325
Crosswalk LOS	C	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]	883	650	533	433
d_b, Bicycle Delay [s]	18.72	27.35	32.28	36.83
I_b,int, Bicycle LOS Score for Intersection	2.336	1.871	2.325	2.319
Bicycle LOS	B	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 12: 48th Avenue/Fultondale Street**

Control Type:	Signalized	Delay (sec / veh):	15.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.395

**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]	200.00	100.00	100.00	150.00	100.00	100.00	40.00	100.00	100.00	175.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.00	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	Fultondale Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	390	21	260	0	29	29	21	1653	100	120	1512	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	86	0	0	10	0	0	33	0	0	4
Total Hourly Volume [veh/h]	257	14	86	0	19	9	14	1091	33	79	998	3
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	4	23	0	5	2	4	296	9	21	271	1
Total Analysis Volume [veh/h]	279	15	93	0	21	10	15	1186	36	86	1085	3
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	Protect	Permis	Permis	ProtPer	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis
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]	16	46	0	9	39	0	9	35	0	10	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	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]	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
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
l2, 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]	11	17	17	21	6	71	63	63	5	66	66
g / C, Green / Cycle	0.11	0.17	0.17	0.21	0.06	0.71	0.63	0.63	0.05	0.66	0.66
(v / s)_i Volume / Saturation Flow Rate	0.09	0.01	0.07	0.00	0.02	0.03	0.26	0.03	0.03	0.22	0.22
s, saturation flow rate [veh/h]	3113	1683	1431	1201	1592	527	4584	1431	3113	3204	1681
c, Capacity [veh/h]	340	281	239	346	93	430	2872	896	143	2098	1101
d1, Uniform Delay [s]	43.61	35.03	37.13	0.00	45.25	4.76	9.41	7.16	46.84	7.67	7.67
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
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
d2, Incremental Delay [s]	4.92	0.08	1.03	0.00	2.08	0.15	0.44	0.08	4.01	0.44	0.84
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	0.82	0.05	0.39	0.00	0.33	0.03	0.41	0.04	0.60	0.34	0.34
d, Delay for Lane Group [s/veh]	48.53	35.11	38.16	0.00	47.33	4.91	9.85	7.24	50.85	8.11	8.51
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]	3.58	0.31	2.08	0.00	0.79	0.10	4.10	0.30	1.12	3.20	3.48
50th-Percentile Queue Length [ft/ln]	89.61	7.82	52.12	0.00	19.75	2.38	102.55	7.42	28.12	79.95	86.92
95th-Percentile Queue Length [veh/ln]	6.45	0.56	3.75	0.00	1.42	0.17	7.38	0.53	2.02	5.76	6.26
95th-Percentile Queue Length [ft/ln]	161.30	14.08	93.81	0.00	35.55	4.28	184.60	13.36	50.62	143.90	156.45

**Movement, Approach, & Intersection Results**

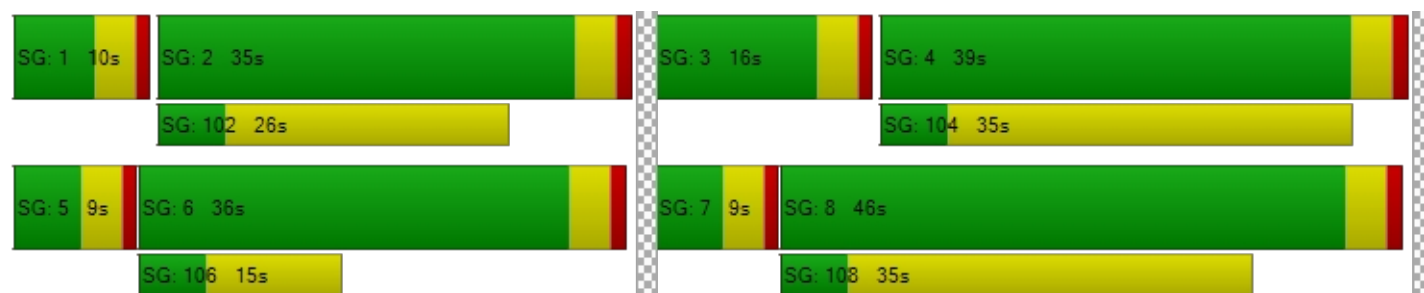
d_M, Delay for Movement [s/veh]	48.53	35.11	38.16	0.00	47.33	47.33	4.91	9.85	7.24	50.85	8.25	8.51
Movement LOS	D	D	D	A	D	D	A	A	A	D	A	A
d_A, Approach Delay [s/veh]	45.52			47.33			9.72			11.37		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	15.71											
Intersection LOS	B											
Intersection V/C	0.395											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	2.687			2.001			3.102			3.048		
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]	840			700			620			640		
d_b, Bicycle Delay [s]	16.83			21.14			23.82			23.14		
I_b,int, Bicycle LOS Score for Intersection	2.340			1.627			2.258			2.208		
Bicycle LOS	B			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 16: 42nd Avenue/Denali Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

#### 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	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	1350	0	0	1173	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	891	0	0	774	0	0	0	0	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	242	0	0	210	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	968	0	0	841	0	0	0	0	0	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	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.56	0.00	0.00	10.09	0.00	0.00	36.65	51.16	11.19	40.28	51.16	11.81
Movement LOS	A	A	A	B	A	A	E	F	B	E	F	B
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
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
d_A, Approach Delay [s/veh]	0.00			0.00			33.00			34.42		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	0.00											
Intersection LOS	A											



### Intersection Level Of Service Report

#### Intersection 17: 42nd Avenue/Fultondale Street

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

#### 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	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	671	0	0	249	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	443	0	0	164	0	0	0	0	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	120	0	0	45	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	482	0	0	178	0	0	0	0	0	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	0.00	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]	7.58	0.00	0.00	8.33	0.00	0.00	14.56	14.40	9.16	14.56	14.40	11.16
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	B
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
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
d_A, Approach Delay [s/veh]	0.00			0.00			12.71			13.37		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	0.00											
Intersection LOS	A											



### Intersection Level Of Service Report

#### Intersection 20: 42nd Avenue/Main Street

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

#### 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	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Main Street		Main Street		42nd Avenue	
Base Volume Input [veh/h]	661	0	0	849	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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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
Total Hourly Volume [veh/h]	436	0	0	560	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]	118	0	0	152	0	0
Total Analysis Volume [veh/h]	474	0	0	609	0	0
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
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	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	8.32	0.00	15.82	9.71
Movement LOS	A	A	A	A	C	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]	0.00		0.00		12.76	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					



### Intersection Level Of Service Report

#### Intersection 46: 48th Avenue/Harvest Road

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.460

#### 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	1	0	1	0	0
Exit Pocket Length [ft]	0.00	300.00	0.00	400.00	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	Harvest Road		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	1162	675	850	1073	966	1407
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	446	0	0	0	929
Total Hourly Volume [veh/h]	767	0	561	708	638	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]	208	0	152	192	173	0
Total Analysis Volume [veh/h]	834	0	610	770	693	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	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street	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]	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	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	18	54	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	C	R	L	C	C	R
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	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
g_i, Effective Green Time [s]	21	21	21	14	71	53	53
g / C, Green / Cycle	0.21	0.21	0.21	0.14	0.71	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.18	0.17	0.00	0.13	0.17	0.15	0.00
s, saturation flow rate [veh/h]	3113	1603	1431	4669	4584	4584	1431
c, Capacity [veh/h]	668	344	307	657	3234	2406	751
d1, Uniform Delay [s]	37.55	37.32	0.00	42.48	5.22	13.30	0.00
k, delay calibration	0.11	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	1.00
d2, Incremental Delay [s]	2.79	4.53	0.00	6.46	0.17	0.30	0.00
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.81	0.00	0.93	0.24	0.29	0.00
d, Delay for Lane Group [s/veh]	40.34	41.85	0.00	48.94	5.39	13.60	0.00
Lane Group LOS	D	D	A	D	A	B	A
Critical Lane Group	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.67	6.80	0.00	5.30	1.69	2.87	0.00
50th-Percentile Queue Length [ft/ln]	166.68	170.02	0.00	132.59	42.16	71.81	0.00
95th-Percentile Queue Length [veh/ln]	10.90	11.08	0.00	9.08	3.04	5.17	0.00
95th-Percentile Queue Length [ft/ln]	272.54	276.95	0.00	227.02	75.89	129.25	0.00



**Movement, Approach, & Intersection Results**

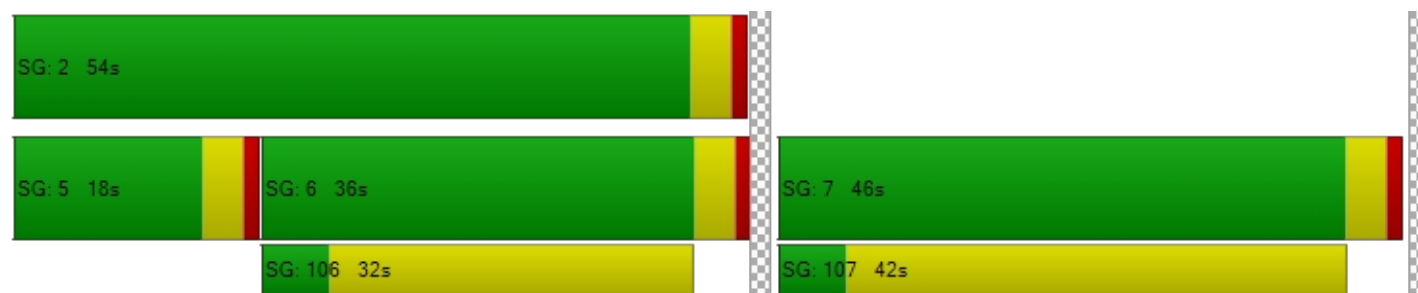
d_M, Delay for Movement [s/veh]	40.84	20.92	48.94	5.39	13.60	0.00
Movement LOS	D	C	D	A	B	A
d_A, Approach Delay [s/veh]	40.84		24.64		13.60	
Approach LOS	D		C		B	
d_I, Intersection Delay [s/veh]	26.66					
Intersection LOS	C					
Intersection V/C	0.460					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	41.41	41.41	41.41
I_p,int, Pedestrian LOS Score for Intersection	3.710	3.219	4.371
Crosswalk LOS	D	C	E
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	840	1000	640
d_b, Bicycle Delay [s]	16.82	12.50	23.12
I_b,int, Bicycle LOS Score for Intersection	3.672	2.319	2.452
Bicycle LOS	D	B	B

**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):	46.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.622

#### 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]	200.00	100.00	100.00	200.00	100.00	200.00	200.00	100.00	100.00	200.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	300.00	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	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	843	531	511	417	422	60	140	617	910	210	272	149
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
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	256	0	0	30	0	0	910	0	0	75
Total Hourly Volume [veh/h]	843	531	255	417	422	30	140	617	0	210	272	74
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	229	144	69	113	115	8	38	168	0	57	74	20
Total Analysis Volume [veh/h]	916	577	277	453	459	33	152	671	0	228	296	80
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	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	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	34	36	0	37	39	0	21	40	0	17	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]	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]	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]	28	51	51	22	45	45	9	30	30	12	33	33
g / C, Green / Cycle	0.22	0.39	0.39	0.17	0.34	0.34	0.07	0.23	0.23	0.09	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.20	0.18	0.19	0.15	0.14	0.02	0.05	0.21	0.00	0.07	0.09	0.06
s, saturation flow rate [veh/h]	4669	3204	1431	3113	3204	1431	3113	3204	1431	3113	3204	1431
c, Capacity [veh/h]	1007	1258	562	518	1101	491	205	733	327	277	807	360
d1, Uniform Delay [s]	49.77	29.25	29.74	52.88	32.71	28.69	59.65	48.91	0.00	58.22	40.08	38.54
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]	3.59	1.21	3.08	4.83	1.16	0.26	5.19	5.04	0.00	6.05	0.28	0.31
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	0.46	0.49	0.87	0.42	0.07	0.74	0.91	0.00	0.82	0.37	0.22
d, Delay for Lane Group [s/veh]	53.36	30.45	32.82	57.72	33.88	28.95	64.83	53.95	0.00	64.28	40.36	38.84
Lane Group LOS	D	C	C	E	C	C	E	D	A	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	10.00	6.91	7.02	7.57	5.76	0.74	2.61	11.10	0.00	3.93	3.96	2.07
50th-Percentile Queue Length [ft/ln]	250.04	172.76	175.52	189.14	143.89	18.48	65.36	277.60	0.00	98.18	99.10	51.86
95th-Percentile Queue Length [veh/ln]	15.19	11.22	11.37	12.08	9.69	1.33	4.71	16.57	0.00	7.07	7.14	3.73
95th-Percentile Queue Length [ft/ln]	379.70	280.54	284.16	301.92	242.25	33.27	117.65	414.22	0.00	176.73	178.38	93.35



**Movement, Approach, & Intersection Results**

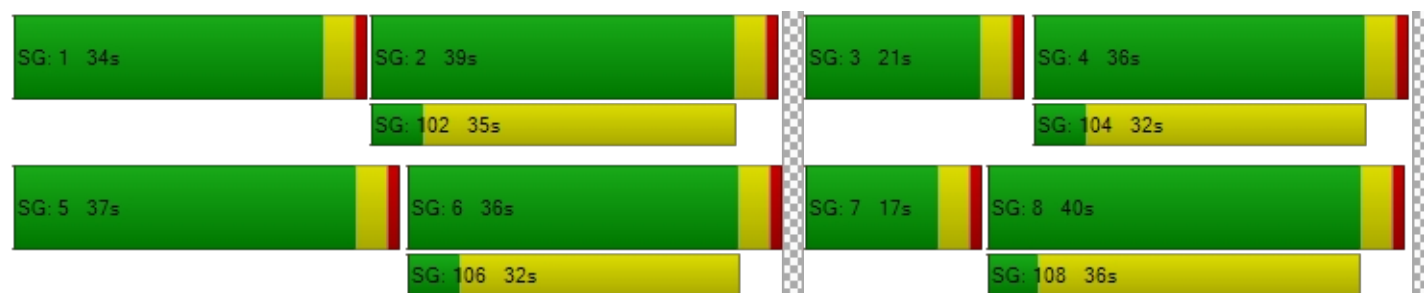
d_M, Delay for Movement [s/veh]	53.36	30.45	32.82	57.72	33.88	28.95	64.83	53.95	0.00	64.28	40.36	38.84
Movement LOS	D	C	C	E	C	C	E	D	A	E	D	D
d_A, Approach Delay [s/veh]	42.68			45.13			55.96			49.19		
Approach LOS	D			D			E			D		
d_I, Intersection Delay [s/veh]	46.83											
Intersection LOS	D											
Intersection V/C	0.622											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	56.32	56.32	56.32	56.32
I_p,int, Pedestrian LOS Score for Intersection	3.548	3.014	4.346	3.045
Crosswalk LOS	D	C	E	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]	492	538	554	492
d_b, Bicycle Delay [s]	36.95	34.72	34.00	36.95
I_b,int, Bicycle LOS Score for Intersection	3.231	2.364	2.989	2.120
Bicycle LOS	C	B	C	B

**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):	26.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

#### 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]	150.00	100.00	150.00	150.00	100.00	150.00	200.00	100.00	200.00	200.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	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	1449	614	518	996	24	66	113	132	151	31	127
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
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	12	0	0	66	0	0	64
Total Hourly Volume [veh/h]	73	1449	307	518	996	12	66	113	66	151	31	63
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	394	83	141	271	3	18	31	18	41	8	17
Total Analysis Volume [veh/h]	79	1575	334	563	1083	13	72	123	72	164	34	68
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	ProtPer	Permis	Permis	Protect	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis
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]	10	30	0	25	45	0	10	43	0	12	45	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]	80	55	55	21	71	71	22	10	10	8	13	13
g / C, Green / Cycle	0.73	0.50	0.50	0.19	0.65	0.65	0.20	0.10	0.10	0.07	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.14	0.34	0.23	0.18	0.24	0.01	0.05	0.07	0.05	0.05	0.02	0.05
s, saturation flow rate [veh/h]	558	4584	1431	3113	4584	1431	1312	1683	1431	3113	1683	1431
c, Capacity [veh/h]	444	2282	712	595	2964	925	341	161	137	219	194	165
d1, Uniform Delay [s]	5.33	21.15	18.11	43.98	9.01	6.94	36.71	48.59	47.43	50.22	43.95	45.21
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]	0.19	1.74	2.21	8.56	0.35	0.03	0.30	7.39	3.13	5.07	0.42	1.63
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	0.18	0.69	0.47	0.95	0.37	0.01	0.21	0.77	0.53	0.75	0.17	0.41
d, Delay for Lane Group [s/veh]	5.52	22.89	20.33	52.54	9.35	6.97	37.01	55.98	50.56	55.29	44.38	46.85
Lane Group LOS	A	C	C	D	A	A	D	E	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.48	10.32	5.86	8.22	3.82	0.11	1.65	3.62	2.00	2.37	0.86	1.80
50th-Percentile Queue Length [ft/ln]	12.00	258.00	146.52	205.38	95.59	2.76	41.29	90.44	49.93	59.14	21.54	45.01
95th-Percentile Queue Length [veh/ln]	0.86	15.59	9.83	12.92	6.88	0.20	2.97	6.51	3.60	4.26	1.55	3.24
95th-Percentile Queue Length [ft/ln]	21.61	389.72	245.77	322.89	172.06	4.98	74.33	162.79	89.88	106.44	38.76	81.01

**Movement, Approach, & Intersection Results**

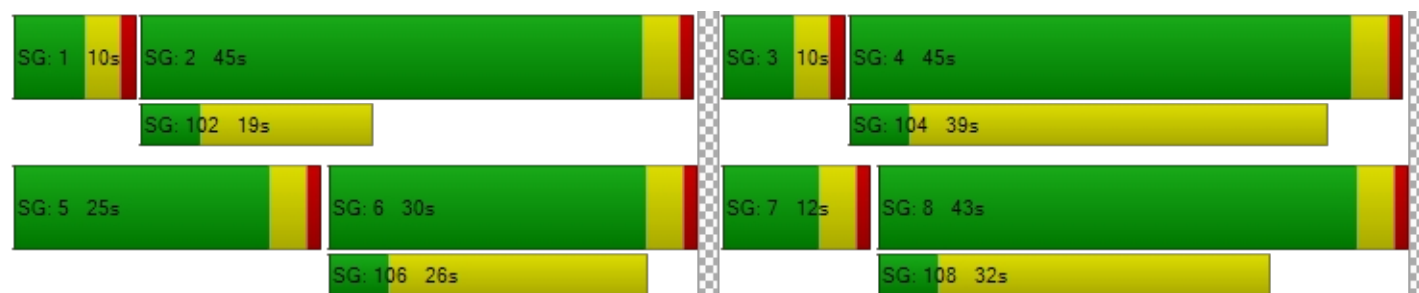
d_M, Delay for Movement [s/veh]	5.52	22.89	20.33	52.54	9.35	6.97	37.01	55.98	50.56	55.29	44.38	46.85
Movement LOS	A	C	C	D	A	A	D	E	D	E	D	D
d_A, Approach Delay [s/veh]	21.77			23.99			49.40			51.74		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	26.32											
Intersection LOS	C											
Intersection V/C	0.650											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	3.622			3.345			2.426			2.824		
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]	473			745			709			745		
d_b, Bicycle Delay [s]	32.10			21.66			22.94			21.66		
I_b,int, Bicycle LOS Score for Intersection	2.822			2.479			2.109			2.104		
Bicycle LOS	C			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 1: 48th Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	43.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.539

#### Intersection Setup

Name	Main Street						48th Avenue			48th Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T L T			T L T			T L T L T			T L T L 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	2	0	1	2	0	1	2	0	1
Entry Pocket Length [ft]	325.00	100.00	400.00	250.00	100.00	250.00	300.00	100.00	400.00	150.00	100.00	400.00
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	400.00	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	Main Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	350	32	400	409	26	155	465	1793	440	230	1519	366
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	132	0	0	102	0	0	145	0	0	121
Total Hourly Volume [veh/h]	231	21	132	270	17	0	307	1183	145	152	1003	121
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	6	36	73	5	0	83	321	39	41	273	33
Total Analysis Volume [veh/h]	251	23	143	293	18	0	334	1286	158	165	1090	132
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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	43	0	16	43	0	19	39	0	12	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	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]	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	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	40	40	12	41	41	14	34	34	8	28	28
g / C, Green / Cycle	0.10	0.36	0.36	0.11	0.37	0.37	0.13	0.31	0.31	0.07	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.08	0.01	0.10	0.09	0.01	0.00	0.11	0.28	0.11	0.05	0.24	0.09
s, saturation flow rate [veh/h]	3113	1683	1431	3113	1683	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	307	611	520	340	630	535	390	1429	446	219	1177	367
d1, Uniform Delay [s]	48.64	22.62	24.79	48.18	21.79	0.00	47.17	36.23	29.31	50.22	39.87	33.48
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]	5.38	0.12	1.31	6.41	0.08	0.00	5.52	2.33	0.48	5.21	3.71	0.59
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	0.82	0.04	0.28	0.86	0.03	0.00	0.86	0.90	0.35	0.75	0.93	0.36
d, Delay for Lane Group [s/veh]	54.02	22.73	26.10	54.59	21.87	0.00	52.69	38.56	29.78	55.43	43.58	34.07
Lane Group LOS	D	C	C	D	C	A	D	D	C	E	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.60	0.41	2.82	4.24	0.31	0.00	4.76	11.11	3.28	2.38	9.85	2.94
50th-Percentile Queue Length [ft/ln]	89.93	10.16	70.62	105.98	7.76	0.00	119.05	277.76	81.99	59.57	246.17	73.53
95th-Percentile Queue Length [veh/ln]	6.47	0.73	5.08	7.62	0.56	0.00	8.34	16.58	5.90	4.29	14.99	5.29
95th-Percentile Queue Length [ft/ln]	161.87	18.29	127.11	190.40	13.97	0.00	208.52	414.42	147.58	107.23	374.83	132.35

**Movement, Approach, & Intersection Results**

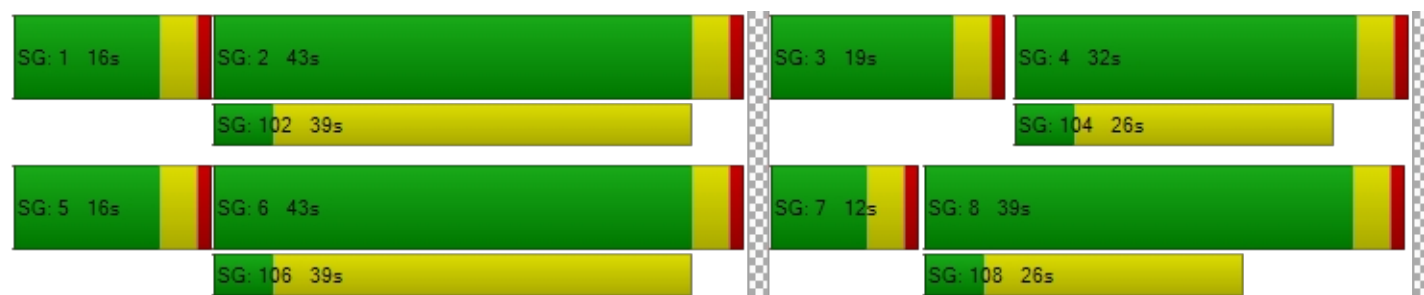
d_M, Delay for Movement [s/veh]	54.02	22.73	26.10	54.59	21.87	0.00	52.69	38.56	29.78	55.43	43.58	34.07
Movement LOS	D	C	C	D	C	A	D	D	C	E	D	C
d_A, Approach Delay [s/veh]	42.72			52.70			40.44			44.09		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	42.96											
Intersection LOS	D											
Intersection V/C	0.539											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	46.38			46.38			46.38			46.38		
I_p,int, Pedestrian LOS Score for Intersection	2.820			2.775			3.512			3.397		
Crosswalk LOS	C			C			D			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]	709			709			636			509		
d_b, Bicycle Delay [s]	22.92			22.92			25.58			30.58		
I_b,int, Bicycle LOS Score for Intersection	2.465			2.241			2.617			2.389		
Bicycle LOS	B			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):	53.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.571

#### 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]	350.00	100.00	250.00	350.00	100.00	300.00	250.00	100.00	450.00	400.00	100.00	200.00
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	100.00	0.00	0.00	300.00
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			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	658	284	462	223	279	257	220	1532	846	500	1195	149
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	305	0	0	85	0	0	279	0	0	49
Total Hourly Volume [veh/h]	434	187	0	147	184	85	145	1011	279	330	789	49
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	118	51	0	40	50	23	39	275	76	90	214	13
Total Analysis Volume [veh/h]	472	203	0	160	200	92	158	1099	303	359	858	53
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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]	120
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	Protect	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	17	52	0	13	48	0	20	36	0	19	35	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]	120	120	120	120	120	120	120	120	120	120	120	120
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]	13	15	15	28	11	11	8	65	65	15	72	72
g / C, Green / Cycle	0.11	0.12	0.12	0.23	0.09	0.09	0.07	0.54	0.54	0.13	0.60	0.60
(v / s)_i Volume / Saturation Flow Rate	0.15	0.06	0.00	0.13	0.06	0.06	0.05	0.24	0.21	0.12	0.19	0.04
s, saturation flow rate [veh/h]	3113	3204	1431	1278	3204	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	339	389	174	320	283	126	214	2495	778	390	2755	860
d1, Uniform Delay [s]	53.50	49.46	0.00	39.72	53.22	53.32	54.85	16.41	15.83	51.90	11.76	9.93
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]	180.98	1.08	0.00	1.20	3.23	7.75	4.94	0.57	1.47	9.10	0.30	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	1.39	0.52	0.00	0.50	0.71	0.73	0.74	0.44	0.39	0.92	0.31	0.06
d, Delay for Lane Group [s/veh]	234.47	50.54	0.00	40.93	56.45	61.08	59.80	16.97	17.29	61.00	12.06	10.07
Lane Group LOS	F	D	A	D	E	E	E	B	B	E	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	13.62	2.92	0.00	4.16	3.06	2.98	2.49	6.05	5.04	5.83	3.73	0.61
50th-Percentile Queue Length [ft/ln]	340.39	73.02	0.00	103.95	76.56	74.45	62.30	151.34	126.05	145.66	93.33	15.13
95th-Percentile Queue Length [veh/ln]	22.08	5.26	0.00	7.48	5.51	5.36	4.49	10.09	8.72	9.78	6.72	1.09
95th-Percentile Queue Length [ft/ln]	551.88	131.43	0.00	187.11	137.81	134.01	112.13	252.21	218.12	244.62	168.00	27.23

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	234.47	50.54	0.00	40.93	56.45	61.08	59.80	16.97	17.29	61.00	12.06	10.07
Movement LOS	F	D	A	D	E	E	E	B	B	E	B	B
d_A, Approach Delay [s/veh]	179.16			51.89			21.37			25.81		
Approach LOS	F			D			C			C		
d_I, Intersection Delay [s/veh]	53.20											
Intersection LOS	D											
Intersection V/C	0.571											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	51.35			51.35			51.35			51.35		
I_p,int, Pedestrian LOS Score for Intersection	3.338			2.752			3.624			3.364		
Crosswalk LOS	C			C			D			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			733			533			517		
d_b, Bicycle Delay [s]	21.61			24.08			32.28			33.02		
I_b,int, Bicycle LOS Score for Intersection	2.368			2.003			2.571			2.285		
Bicycle LOS	B			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):	13.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.416

#### 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]	200.00	100.00	100.00	150.00	100.00	100.00	40.00	100.00	100.00	175.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.00	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	Fultondale Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	180	32	130	10	26	26	32	1825	360	310	1638	55
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	9	0	0	119	0	0	18
Total Hourly Volume [veh/h]	119	21	43	7	17	8	21	1205	119	205	1081	18
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	6	12	2	5	2	6	327	32	56	294	5
Total Analysis Volume [veh/h]	129	23	47	8	18	9	23	1310	129	223	1175	20
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	Protect	Permis	Permis	ProtPer	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis
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	30	0	12	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
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
l2, 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]	5	9	9	14	5	68	56	56	8	62	62
g / C, Green / Cycle	0.06	0.10	0.10	0.16	0.06	0.76	0.62	0.62	0.09	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.04	0.01	0.03	0.01	0.02	0.05	0.29	0.09	0.07	0.25	0.25
s, saturation flow rate [veh/h]	3113	1683	1431	1284	1589	496	4584	1431	3113	3204	1669
c, Capacity [veh/h]	176	170	145	306	89	441	2844	887	279	2193	1142
d1, Uniform Delay [s]	41.87	36.94	37.67	32.21	40.87	3.41	9.10	7.14	40.25	5.95	5.95
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
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
d2, Incremental Delay [s]	5.79	0.36	1.29	0.03	1.89	0.22	0.54	0.34	5.24	0.46	0.88
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	0.73	0.14	0.32	0.03	0.30	0.05	0.46	0.15	0.80	0.36	0.36
d, Delay for Lane Group [s/veh]	47.66	37.29	38.96	32.25	42.76	3.64	9.64	7.49	45.49	6.41	6.83
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]	1.54	0.47	1.01	0.15	0.62	0.10	4.17	1.02	2.59	2.73	2.97
50th-Percentile Queue Length [ft/ln]	38.43	11.86	25.13	3.74	15.42	2.58	104.14	25.45	64.85	68.21	74.36
95th-Percentile Queue Length [veh/ln]	2.77	0.85	1.81	0.27	1.11	0.19	7.50	1.83	4.67	4.91	5.35
95th-Percentile Queue Length [ft/ln]	69.17	21.35	45.24	6.73	27.76	4.64	187.45	45.82	116.72	122.77	133.86

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.66	37.29	38.96	32.25	42.76	42.76	3.64	9.64	7.49	45.49	6.55	6.83
Movement LOS	D	D	D	C	D	D	A	A	A	D	A	A
d_A, Approach Delay [s/veh]	44.41			40.36			9.35			12.68		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	13.46											
Intersection LOS	B											
Intersection V/C	0.416											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	2.634			2.019			3.250			3.101		
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]	777			777			577			644		
d_b, Bicycle Delay [s]	16.84			16.84			22.80			20.71		
I_b,int, Bicycle LOS Score for Intersection	1.959			1.632			2.429			2.349		
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 16: 42nd Avenue/Denali Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

#### 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	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	1350	0	0	1173	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	891	0	0	774	0	0	0	0	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	242	0	0	210	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	968	0	0	841	0	0	0	0	0	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	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.56	0.00	0.00	10.09	0.00	0.00	36.65	51.16	11.19	40.28	51.16	11.81
Movement LOS	A	A	A	B	A	A	E	F	B	E	F	B
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
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
d_A, Approach Delay [s/veh]	0.00			0.00			33.00			34.42		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	0.00											
Intersection LOS	A											



### Intersection Level Of Service Report

#### Intersection 17: 42nd Avenue/Fultondale Street

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

#### 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	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	671	0	0	249	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	443	0	0	164	0	0	0	0	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	120	0	0	45	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	482	0	0	178	0	0	0	0	0	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	0.00	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]	7.58	0.00	0.00	8.33	0.00	0.00	14.56	14.40	9.16	14.56	14.40	11.16
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	B
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
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
d_A, Approach Delay [s/veh]	0.00			0.00			12.71			13.37		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	0.00											
Intersection LOS	A											



### Intersection Level Of Service Report

#### Intersection 20: 42nd Avenue/Main Street

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

#### 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	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Main Street		Main Street		42nd Avenue	
Base Volume Input [veh/h]	661	0	0	849	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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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
Total Hourly Volume [veh/h]	436	0	0	560	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]	118	0	0	152	0	0
Total Analysis Volume [veh/h]	474	0	0	609	0	0
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
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	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	8.32	0.00	15.82	9.71
Movement LOS	A	A	A	A	C	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]	0.00		0.00		12.76	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					



### Intersection Level Of Service Report

#### Intersection 46: 48th Avenue/Harvest Road

Control Type:	Signalized	Delay (sec / veh):	25.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.535

#### 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	1	0	1	0	0
Exit Pocket Length [ft]	0.00	300.00	0.00	400.00	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	Harvest Road		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	1379	700	800	1166	1282	1348
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	462	0	0	0	890
Total Hourly Volume [veh/h]	910	0	528	770	846	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]	247	0	143	209	230	0
Total Analysis Volume [veh/h]	989	0	574	837	920	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	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street	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]	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	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	18	54	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	C	R	L	C	C	R
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	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
g_i, Effective Green Time [s]	25	25	25	14	67	49	49
g / C, Green / Cycle	0.25	0.25	0.25	0.14	0.67	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.00	0.12	0.18	0.20	0.00
s, saturation flow rate [veh/h]	3113	1603	1431	4669	4584	4584	1431
c, Capacity [veh/h]	778	401	358	656	3071	2244	700
d1, Uniform Delay [s]	35.68	35.41	0.00	42.12	6.66	16.30	0.00
k, delay calibration	0.11	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	1.00
d2, Incremental Delay [s]	2.67	4.27	0.00	3.89	0.22	0.56	0.00
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.82	0.00	0.88	0.27	0.41	0.00
d, Delay for Lane Group [s/veh]	38.35	39.68	0.00	46.01	6.88	16.86	0.00
Lane Group LOS	D	D	A	D	A	B	A
Critical Lane Group	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.80	7.92	0.00	4.82	2.21	4.45	0.00
50th-Percentile Queue Length [ft/ln]	194.89	198.12	0.00	120.43	55.17	111.18	0.00
95th-Percentile Queue Length [veh/ln]	12.37	12.54	0.00	8.42	3.97	7.91	0.00
95th-Percentile Queue Length [ft/ln]	309.37	313.54	0.00	210.42	99.31	197.64	0.00

**Movement, Approach, & Intersection Results**

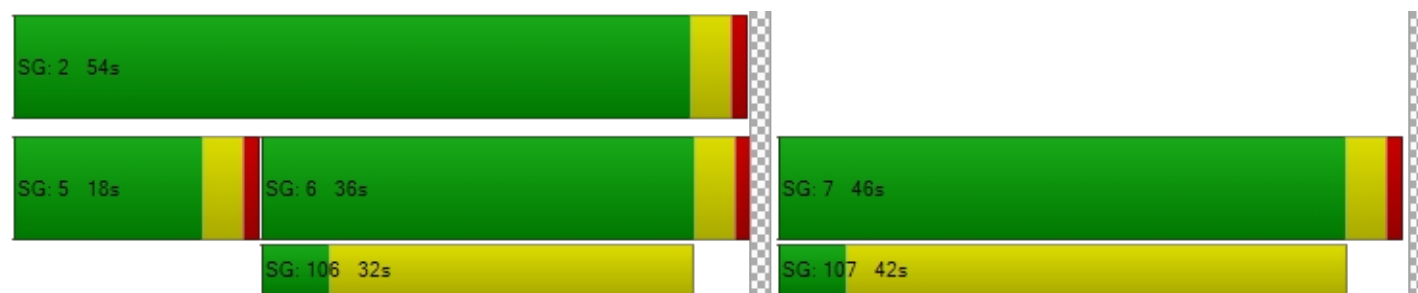
d_M, Delay for Movement [s/veh]	38.79	19.84	46.01	6.88	16.86	0.00
Movement LOS	D	B	D	A	B	A
d_A, Approach Delay [s/veh]	38.79		22.80		16.86	
Approach LOS	D		C		B	
d_I, Intersection Delay [s/veh]	25.92					
Intersection LOS	C					
Intersection V/C	0.535					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	41.41	41.41	41.41
I_p,int, Pedestrian LOS Score for Intersection	3.745	3.245	4.373
Crosswalk LOS	D	C	E
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	840	1000	640
d_b, Bicycle Delay [s]	16.82	12.50	23.12
I_b,int, Bicycle LOS Score for Intersection	3.954	2.336	2.555
Bicycle LOS	D	B	B

**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):	46.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

#### 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]	200.00	100.00	100.00	200.00	100.00	200.00	200.00	100.00	100.00	200.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	300.00	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	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	941	455	286	155	530	130	90	300	936	240	600	430
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
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	65	0	0	936	0	0	215
Total Hourly Volume [veh/h]	941	455	143	155	530	65	90	300	0	240	600	215
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	256	124	39	42	144	18	24	82	0	65	163	58
Total Analysis Volume [veh/h]	1023	495	155	168	576	71	98	326	0	261	652	234
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	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	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	33	36	0	36	39	0	22	40	0	18	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]	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]	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]	29	69	69	9	49	49	6	23	23	13	30	30
g / C, Green / Cycle	0.22	0.53	0.53	0.07	0.38	0.38	0.05	0.18	0.18	0.10	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.22	0.15	0.11	0.05	0.18	0.05	0.03	0.10	0.00	0.08	0.20	0.16
s, saturation flow rate [veh/h]	4669	3204	1431	3113	3204	1431	3113	3204	1431	3113	3204	1431
c, Capacity [veh/h]	1042	1696	757	224	1212	541	146	566	253	308	733	327
d1, Uniform Delay [s]	50.25	17.03	16.15	59.19	30.65	26.45	60.99	49.06	0.00	57.61	48.53	46.22
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]	9.46	0.44	0.61	5.01	1.34	0.50	5.30	0.93	0.00	6.39	3.93	2.91
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	0.98	0.29	0.20	0.75	0.48	0.13	0.67	0.58	0.00	0.85	0.89	0.71
d, Delay for Lane Group [s/veh]	59.71	17.47	16.76	64.20	31.98	26.95	66.29	49.99	0.00	64.00	52.46	49.12
Lane Group LOS	E	B	B	E	C	C	E	D	A	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	11.90	4.23	2.58	2.88	7.09	1.54	1.70	4.95	0.00	4.50	10.62	7.25
50th-Percentile Queue Length [ft/ln]	297.62	105.72	64.47	71.91	177.35	38.42	42.59	123.64	0.00	112.46	265.43	181.20
95th-Percentile Queue Length [veh/ln]	17.56	7.60	4.64	5.18	11.46	2.77	3.07	8.59	0.00	7.98	15.96	11.66
95th-Percentile Queue Length [ft/ln]	439.08	190.03	116.04	129.44	286.55	69.16	76.66	214.82	0.00	199.43	399.03	291.58

**Movement, Approach, & Intersection Results**

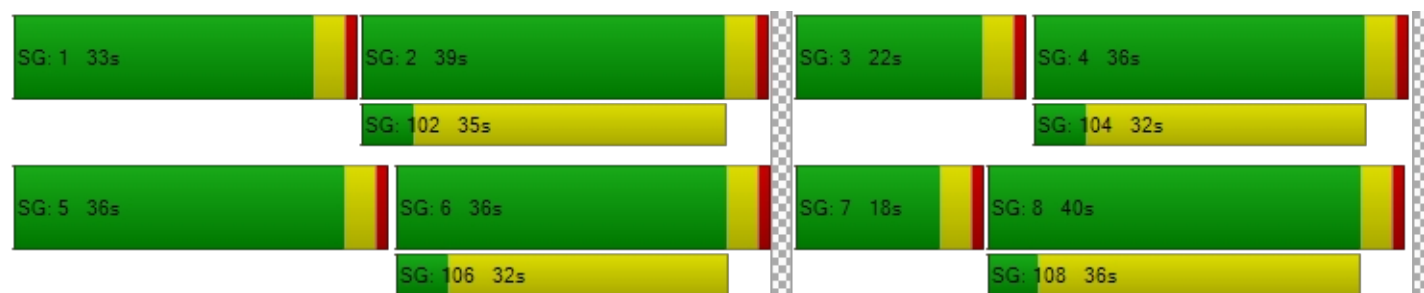
d_M, Delay for Movement [s/veh]	59.71	17.47	16.76	64.20	31.98	26.95	66.29	49.99	0.00	64.00	52.46	49.12
Movement LOS	E	B	B	E	C	C	E	D	A	E	D	D
d_A, Approach Delay [s/veh]	43.23			38.19			53.75			54.41		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	46.48											
Intersection LOS	D											
Intersection V/C	0.634											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	56.32			56.32			56.32			56.32		
I_p,int, Pedestrian LOS Score for Intersection	3.386			3.071			4.389			3.219		
Crosswalk LOS	C			C			E			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]	492			538			554			492		
d_b, Bicycle Delay [s]	36.94			34.72			33.99			36.94		
I_b,int, Bicycle LOS Score for Intersection	3.058			2.286			2.682			2.683		
Bicycle LOS	C			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 48: 38th Parkway/Powhatan Road

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.671

#### 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]	150.00	100.00	150.00	150.00	100.00	150.00	200.00	100.00	200.00	200.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	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]	152	1180	168	138	1529	65	24	78	83	597	111	492
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
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	33	0	0	42	0	0	246
Total Hourly Volume [veh/h]	152	1180	84	138	1529	32	24	78	41	597	111	246
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	321	23	38	415	9	7	21	11	162	30	67
Total Analysis Volume [veh/h]	165	1283	91	150	1662	35	26	85	45	649	121	267
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	ProtPer	Permis	Permis	Protect	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis
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	16	37	0	9	36	0	28	55	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]	64	53	53	7	55	55	38	10	10	24	31	31
g / C, Green / Cycle	0.58	0.48	0.48	0.07	0.50	0.50	0.34	0.09	0.09	0.22	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.40	0.28	0.06	0.05	0.36	0.02	0.03	0.05	0.03	0.21	0.07	0.19
s, saturation flow rate [veh/h]	409	4584	1431	3113	4584	1431	986	1683	1431	3113	1683	1431
c, Capacity [veh/h]	256	2199	686	208	2294	716	384	151	129	679	475	404
d1, Uniform Delay [s]	21.09	20.69	15.91	50.36	21.56	14.09	24.23	48.03	47.08	42.51	30.57	34.88
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]	11.82	1.14	0.40	4.64	2.03	0.13	0.07	3.25	1.62	8.61	0.28	1.86
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	0.64	0.58	0.13	0.72	0.72	0.05	0.07	0.56	0.35	0.96	0.25	0.66
d, Delay for Lane Group [s/veh]	32.91	21.83	16.31	55.00	23.59	14.22	24.30	51.27	48.70	51.12	30.85	36.74
Lane Group LOS	C	C	B	D	C	B	C	D	D	D	C	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.65	7.95	1.34	2.16	11.18	0.47	0.46	2.37	1.22	9.43	2.52	6.46
50th-Percentile Queue Length [ft/ln]	66.36	198.81	33.49	53.89	279.54	11.74	11.54	59.24	30.42	235.70	63.03	161.61
95th-Percentile Queue Length [veh/ln]	4.78	12.58	2.41	3.88	16.67	0.85	0.83	4.27	2.19	14.46	4.54	10.63
95th-Percentile Queue Length [ft/ln]	119.45	314.43	60.29	97.00	416.64	21.13	20.77	106.64	54.76	361.59	113.46	265.85

**Movement, Approach, & Intersection Results**

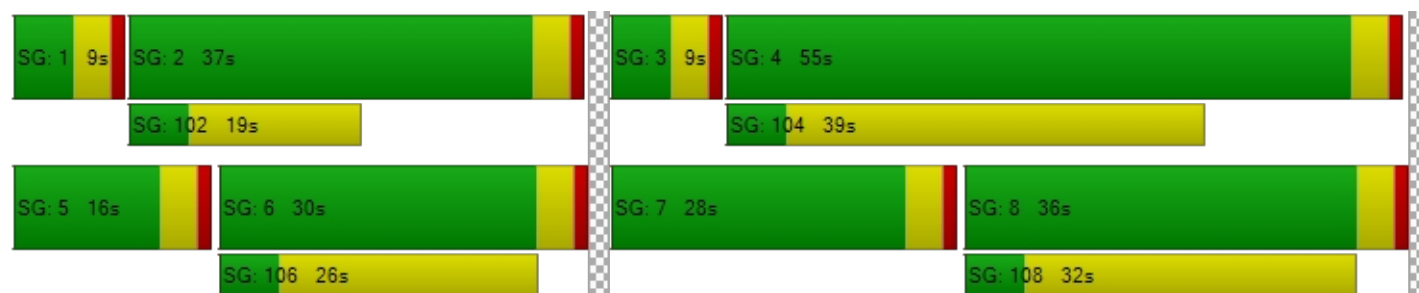
d_M, Delay for Movement [s/veh]	32.91	21.83	16.31	55.00	23.59	14.22	24.30	51.27	48.70	51.12	30.85	36.74
Movement LOS	C	C	B	D	C	B	C	D	D	D	C	D
d_A, Approach Delay [s/veh]	22.69			25.97			46.04			45.05		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	29.87											
Intersection LOS	C											
Intersection V/C	0.671											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	3.346			3.397			2.458			3.089		
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			600			582			927		
d_b, Bicycle Delay [s]	32.10			26.97			27.68			15.84		
I_b,int, Bicycle LOS Score for Intersection	2.452			2.594			1.886			3.677		
Bicycle LOS	B			B			A			D		

**Sequence**

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





## **Appendix D – Horizon With Project Analyses**



### Intersection Level Of Service Report

#### Intersection 1: 48th Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	49.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.502

#### 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]	325.00	100.00	400.00	250.00	100.00	250.00	300.00	100.00	400.00
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	400.00
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						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	390	21	250	260	29	79	188	1452	400	420	1744	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	42	0	6	0	0	0	0	93	13	5	260	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	86	0	0	52	0	0	139	0	0	46
Total Hourly Volume [veh/h]	299	14	85	172	19	0	124	1051	138	282	1411	46
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	81	4	23	47	5	0	34	286	38	77	383	13
Total Analysis Volume [veh/h]	325	15	92	187	21	0	135	1142	150	307	1534	50
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	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	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	21	43	0	21	43	0	11	54	0	22	65	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]	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]	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]	16	54	54	11	48	48	7	44	44	16	53	53
g / C, Green / Cycle	0.12	0.38	0.38	0.08	0.34	0.34	0.05	0.31	0.31	0.11	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.10	0.01	0.06	0.06	0.01	0.00	0.04	0.25	0.10	0.10	0.33	0.03
s, saturation flow rate [veh/h]	3113	1683	1431	3113	1683	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	367	644	548	235	573	487	158	1440	449	352	1727	539
d1, Uniform Delay [s]	60.83	26.90	28.49	63.65	30.82	0.00	65.94	43.84	36.77	61.08	40.87	28.18
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]	7.26	0.07	0.66	6.05	0.12	0.00	12.35	1.02	0.43	6.73	1.73	0.07
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	0.89	0.02	0.17	0.80	0.04	0.00	0.86	0.79	0.33	0.87	0.89	0.09
d, Delay for Lane Group [s/veh]	68.09	26.96	29.15	69.70	30.94	0.00	78.29	44.86	37.21	67.81	42.60	28.25
Lane Group LOS	E	C	C	E	C	A	E	D	D	E	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.07	0.33	2.18	3.49	0.50	0.00	2.67	12.19	4.04	5.71	16.68	1.12
50th-Percentile Queue Length [ft/ln]	151.79	8.28	54.41	87.19	12.57	0.00	66.81	304.77	100.97	142.80	416.91	27.92
95th-Percentile Queue Length [veh/ln]	10.11	0.60	3.92	6.28	0.91	0.00	4.81	17.92	7.27	9.63	23.37	2.01
95th-Percentile Queue Length [ft/ln]	252.82	14.91	97.93	156.93	22.63	0.00	120.27	447.93	181.74	240.78	584.34	50.25

**Movement, Approach, & Intersection Results**

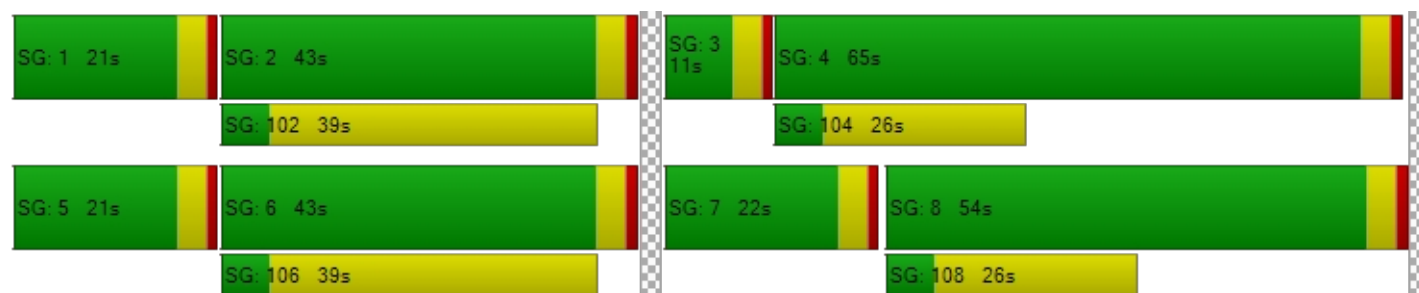
d_M, Delay for Movement [s/veh]	68.09	26.96	29.15	69.70	30.94	0.00	78.29	44.86	37.21	67.81	42.60	28.25
Movement LOS	E	C	C	E	C	A	E	D	D	E	D	C
d_A, Approach Delay [s/veh]	58.37			65.78			47.22			46.31		
Approach LOS	E			E			D			D		
d_I, Intersection Delay [s/veh]	48.98											
Intersection LOS	D											
Intersection V/C	0.502											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	2.782			2.631			3.526			3.310		
Crosswalk LOS	C			B			D			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]	557			557			714			871		
d_b, Bicycle Delay [s]	36.43			36.43			28.93			22.29		
I_b,int, Bicycle LOS Score for Intersection	2.414			1.989			2.421			2.625		
Bicycle LOS	B			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):	34.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.539

#### 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]	350.00	100.00	250.00	350.00	100.00	300.00	250.00	100.00	450.00	400.00	100.00	200.00
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	100.00	0.00	0.00	300.00
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			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	646	243	461	123	217	195	157	1190	616	340	1463	128
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	96	26	16	12	9	0	0	70	41	9	168	30
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	320	0	0	65	0	0	224	0	0	57
Total Hourly Volume [veh/h]	522	186	0	93	152	64	104	855	224	233	1134	57
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	142	51	0	25	41	17	28	232	61	63	308	15
Total Analysis Volume [veh/h]	567	202	0	101	165	70	113	929	243	253	1233	62
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	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	Protect	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	43	77	0	9	43	0	11	36	0	18	43	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]	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]	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]	28	33	33	42	10	10	7	72	72	13	79	79
g / C, Green / Cycle	0.20	0.24	0.24	0.30	0.07	0.07	0.05	0.52	0.52	0.09	0.56	0.56
(v / s)_i Volume / Saturation Flow Rate	0.18	0.06	0.00	0.09	0.05	0.05	0.04	0.20	0.17	0.08	0.27	0.04
s, saturation flow rate [veh/h]	3113	3204	1431	1153	3204	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	629	762	340	369	231	103	155	2368	739	296	2574	803
d1, Uniform Delay [s]	54.47	43.40	0.00	36.52	63.55	63.38	65.55	20.52	19.71	62.39	18.40	14.06
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]	5.04	0.18	0.00	0.40	4.10	7.61	6.33	0.49	1.19	7.02	0.64	0.19
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	0.27	0.00	0.27	0.72	0.68	0.73	0.39	0.33	0.86	0.48	0.08
d, Delay for Lane Group [s/veh]	59.51	43.58	0.00	36.92	67.65	70.99	71.88	21.01	20.90	69.41	19.05	14.25
Lane Group LOS	E	D	A	D	E	E	E	C	C	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	10.19	2.90	0.00	2.65	3.02	2.66	2.13	6.28	4.90	4.74	8.11	0.96
50th-Percentile Queue Length [ft/ln]	254.87	72.58	0.00	66.34	75.51	66.56	53.35	157.09	122.48	118.44	202.64	23.96
95th-Percentile Queue Length [veh/ln]	15.43	5.23	0.00	4.78	5.44	4.79	3.84	10.39	8.53	8.31	12.77	1.73
95th-Percentile Queue Length [ft/ln]	385.78	130.65	0.00	119.41	135.92	119.81	96.04	259.87	213.24	207.67	319.37	43.14

**Movement, Approach, & Intersection Results**

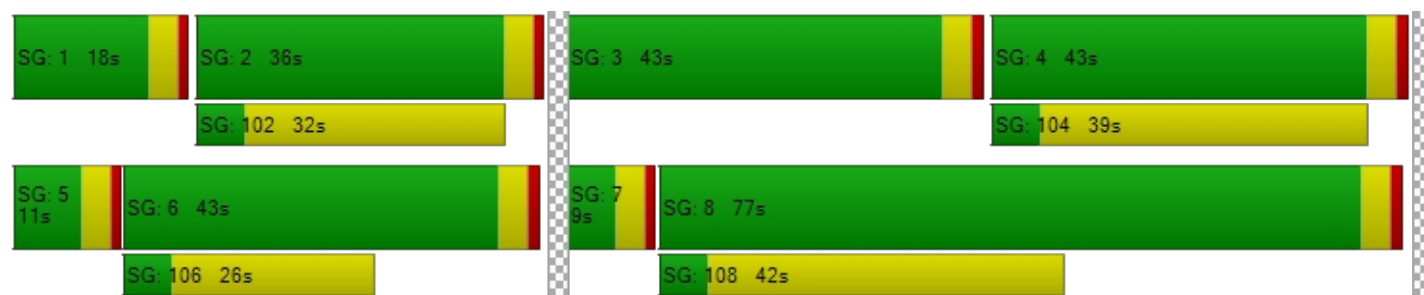
d_M, Delay for Movement [s/veh]	59.51	43.58	0.00	36.92	67.65	70.99	71.88	21.01	20.90	69.41	19.05	14.25
Movement LOS	E	D	A	D	E	E	E	C	C	E	B	B
d_A, Approach Delay [s/veh]	55.33			59.11			25.46			27.09		
Approach LOS	E			E			C			C		
d_I, Intersection Delay [s/veh]	34.80											
Intersection LOS	C											
Intersection V/C	0.539											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	3.346	2.703	3.563	3.394
Crosswalk LOS	C	B	D	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]	1043	557	457	557
d_b, Bicycle Delay [s]	16.03	36.43	41.65	36.43
I_b,int, Bicycle LOS Score for Intersection	2.458	1.890	2.390	2.442
Bicycle LOS	B	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 12: 48th Avenue/Fultondale Street

Control Type:	Signalized	Delay (sec / veh):	19.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

#### 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]	200.00	100.00	100.00	150.00	100.00	100.00	40.00	100.00	100.00	175.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.00	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	Fultondale Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	390	21	260	0	29	29	21	1653	100	120	1512	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	82	0	59	0	0	0	0	76	45	24	125	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	116	0	0	10	0	0	56	0	0	4
Total Hourly Volume [veh/h]	339	14	115	0	19	9	14	1167	55	103	1123	3
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	92	4	31	0	5	2	4	317	15	28	305	1
Total Analysis Volume [veh/h]	368	15	125	0	21	10	15	1268	60	112	1221	3
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	Protect	Permis	Permis	ProtPer	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis
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]	16	46	0	9	39	0	9	35	0	10	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	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]	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
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
l2, 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]	12	18	18	22	6	70	61	61	5	64	64
g / C, Green / Cycle	0.12	0.18	0.18	0.22	0.06	0.70	0.61	0.61	0.05	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.12	0.01	0.09	0.00	0.02	0.03	0.28	0.04	0.04	0.25	0.25
s, saturation flow rate [veh/h]	3113	1683	1431	1170	1592	475	4584	1431	3113	3204	1681
c, Capacity [veh/h]	375	300	255	354	94	383	2781	868	168	2059	1080
d1, Uniform Delay [s]	43.92	34.11	37.04	0.00	45.22	5.43	10.71	8.08	46.48	8.54	8.54
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
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
d2, Incremental Delay [s]	17.51	0.07	1.46	0.00	2.03	0.19	0.54	0.15	4.48	0.56	1.06
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	0.98	0.05	0.49	0.00	0.33	0.04	0.46	0.07	0.67	0.39	0.39
d, Delay for Lane Group [s/veh]	61.43	34.18	38.50	0.00	47.25	5.62	11.25	8.24	50.95	9.10	9.60
Lane Group LOS	E	C	D	A	D	A	B	A	D	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.41	0.31	2.84	0.00	0.79	0.10	4.82	0.54	1.47	3.92	4.26
50th-Percentile Queue Length [ft/ln]	135.34	7.70	70.94	0.00	19.73	2.56	120.53	13.47	36.63	97.94	106.53
95th-Percentile Queue Length [veh/ln]	9.23	0.55	5.11	0.00	1.42	0.18	8.42	0.97	2.64	7.05	7.65
95th-Percentile Queue Length [ft/ln]	230.73	13.85	127.69	0.00	35.52	4.61	210.56	24.25	65.94	176.30	191.17

**Movement, Approach, & Intersection Results**

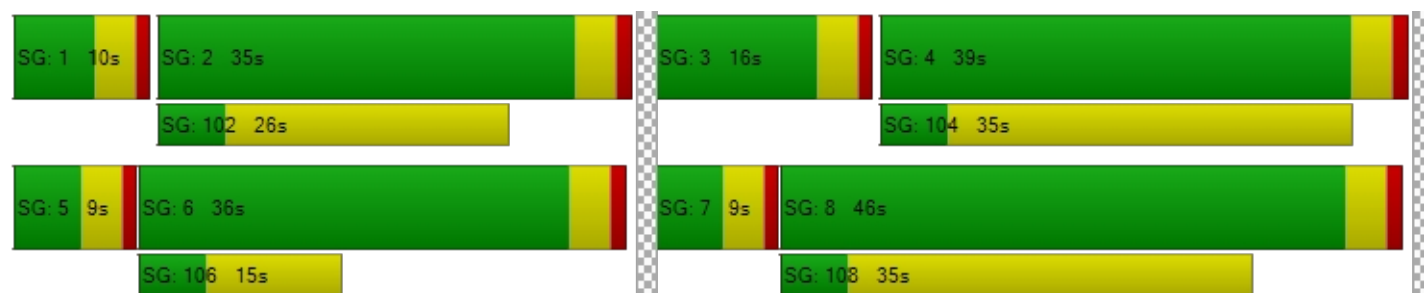
d_M, Delay for Movement [s/veh]	61.43	34.18	38.50	0.00	47.25	47.25	5.62	11.25	8.24	50.95	9.27	9.60
Movement LOS	E	C	D	A	D	D	A	B	A	D	A	A
d_A, Approach Delay [s/veh]	54.98			47.25			11.05			12.76		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	19.05											
Intersection LOS	B											
Intersection V/C	0.450											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	2.766	2.001	3.178	3.085
Crosswalk LOS	C	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]	839	700	620	640
d_b, Bicycle Delay [s]	16.85	21.16	23.84	23.15
I_b,int, Bicycle LOS Score for Intersection	2.589	1.627	2.329	2.297
Bicycle LOS	B	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 16: 42nd Avenue/Denali Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	988.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.692

#### 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	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	1350	0	0	1173	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	74	0	4	1	44	0	0	135	107
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	891	0	74	774	4	1	44	0	0	135	107
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	242	0	20	210	1	0	12	0	0	37	29
Total Analysis Volume [veh/h]	0	968	0	80	841	4	1	48	0	0	147	116
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	0.00	0.01	0.00	0.11	0.01	0.00	0.00	0.87	0.00	0.00	2.69	0.22
d_M, Delay for Movement [s/veh]	9.57	0.00	0.00	10.74	0.00	0.00	12.74	205.26	145.89	395.48	988.09	928.97
Movement LOS	A	A	A	B	A	A	B	F	F	F	F	F
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.38	0.00	0.00	0.01	3.83	3.83	0.00	25.46	25.46
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	9.52	0.00	0.00	0.16	95.80	95.80	0.00	636.45	636.45
d_A, Approach Delay [s/veh]	0.00			0.93			201.33			962.01		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	119.61											
Intersection LOS	F											



### Intersection Level Of Service Report

#### Intersection 17: 42nd Avenue/Fultondale Street

Control Type:	Two-way stop	Delay (sec / veh):	1,761.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.866

#### 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	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	671	0	0	249	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	112	0	32	8	111	0	0	210	49
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	443	0	112	164	32	8	111	0	0	210	49
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	120	0	30	45	9	2	30	0	0	57	13
Total Analysis Volume [veh/h]	0	482	0	122	178	35	9	121	0	0	228	53
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	0.00	0.00	0.00	0.11	0.00	0.00	1.87	0.50	0.00	0.00	0.97	0.09
d_M, Delay for Movement [s/veh]	7.65	0.00	0.00	8.76	0.00	0.00	1761.9	34.38	23.62	38.85	116.93	107.71
Movement LOS	A	A	A	A	A	A	F	D	C	E	F	F
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.38	0.00	0.00	2.12	2.60	2.60	0.00	11.38	11.38
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	9.51	0.00	0.00	52.92	65.01	65.01	0.00	284.51	284.51
d_A, Approach Delay [s/veh]	0.00			3.19			153.98			115.19		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	43.53											
Intersection LOS	F											



### Intersection Level Of Service Report

#### Intersection 20: 42nd Avenue/Main Street

Control Type:	Two-way stop	Delay (sec / veh):	24.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.386

#### 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	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Main Street		Main Street		42nd Avenue	
Base Volume Input [veh/h]	661	0	0	849	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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	35	11	17	107	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
Total Hourly Volume [veh/h]	445	35	11	577	107	31
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]	121	10	3	157	29	8
Total Analysis Volume [veh/h]	484	38	12	627	116	34
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
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	0.00	0.01	0.01	0.39	0.05
d_M, Delay for Movement [s/veh]	0.00	0.00	8.50	0.00	24.34	10.12
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.03	0.00	1.76	0.14
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.87	0.00	43.88	3.62
d_A, Approach Delay [s/veh]	0.00		0.16		21.12	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.49					
Intersection LOS	C					

**Intersection Level Of Service Report****Intersection 23:**

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

Delay (sec / veh): 12.2  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.021

**Intersection Setup**

Name			42nd Avenue		42nd 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	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			42nd Avenue		42nd Avenue	
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	10	4	220	249	4
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]	10	10	4	220	249	4
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]	3	3	1	60	68	1
Total Analysis Volume [veh/h]	11	11	4	239	271	4
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	0.02	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	12.21	9.92	7.80	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.11	0.11	0.01	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.78	2.78	0.23	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	11.06		0.13		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.51					
Intersection LOS	B					





### Intersection Level Of Service Report

#### Intersection 24:

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

Delay (sec / veh): 20.2  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.078

#### 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	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			48th Avenue		48th Avenue	
Base Volume Input [veh/h]	0	0	2235	0	0	2373
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	30	18	98	13	8	134
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	18	1573	13	8	1700
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	427	4	2	462
Total Analysis Volume [veh/h]	33	20	1710	14	9	1848
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	0.08	0.02	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	20.24	0.00	0.00	0.00	0.00
Movement LOS		C	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.25	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	6.30	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	20.24		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.11					
Intersection LOS	C					



### Intersection Level Of Service Report

#### Intersection 25: 48th Avenue/PA-31 Street

Control Type:	Two-way stop	Delay (sec / veh):	908.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.602

#### 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	0	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]	0	0	2235	0	0	2373
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	114	46	72	44	18	28
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]	114	46	1547	44	18	1594
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]	31	13	420	12	5	433
Total Analysis Volume [veh/h]	124	50	1682	48	20	1733
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	2.60	0.20	0.02	0.00	0.12	0.02
d_M, Delay for Movement [s/veh]	908.18	22.53	0.00	0.00	28.80	0.00
Movement LOS	F	C	A	A	D	A
95th-Percentile Queue Length [veh/ln]	13.09	0.71	0.00	0.00	0.39	0.00
95th-Percentile Queue Length [ft/ln]	327.34	17.80	0.00	0.00	9.73	0.00
d_A, Approach Delay [s/veh]	653.68		0.00		0.33	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	31.26					
Intersection LOS	F					






### Intersection Level Of Service Report

#### Intersection 26: Reserve Loop/PA-31 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):	0.049

#### 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	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	PA-31 Street		Reserve Loop		Reserve Loop	
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	31	32	77	24	6	83
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]	31	32	77	24	6	83
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	9	21	7	2	23
Total Analysis Volume [veh/h]	34	35	84	26	7	90
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	0.03	0.06	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.40	8.67	7.50	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.15	0.11	0.15	0.15	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.82	2.67	3.67	3.67	0.00	0.00
d_A, Approach Delay [s/veh]	9.52		5.73		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.66					
Intersection LOS	B					



### Intersection Level Of Service Report Intersection 27:

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	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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	1	101	38	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	101	38	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	27	10	0
Total Analysis Volume [veh/h]	0	13	1	110	41	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]	9.34	8.54	7.30	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]	0.96	0.96	0.04	0.04	0.00	0.00
d_A, Approach Delay [s/veh]	8.54		0.07		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.72					
Intersection LOS	A					



**Intersection Level Of Service Report****Intersection 28:**

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

Delay (sec / veh): 9.9  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.034

**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	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	28	8	17	20	13	24	0	18	21	0	50
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	28	8	17	20	13	24	0	18	21	0	50
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	8	2	5	5	4	7	0	5	6	0	14
Total Analysis Volume [veh/h]	9	30	9	18	22	14	26	0	20	23	0	54
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	0.01	0.00	0.00	0.03	0.00	0.02	0.03	0.00	0.05
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.32	0.00	0.00	9.92	10.00	8.67	9.74	10.11	8.79
Movement LOS	A	A	A	A	A	A	A	B	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	0.03	0.03	0.03	0.17	0.17	0.17	0.26	0.26	0.26
95th-Percentile Queue Length [ft/ln]	0.39	0.39	0.39	0.82	0.82	0.82	4.19	4.19	4.19	6.53	6.53	6.53
d_A, Approach Delay [s/veh]	1.37			2.44			9.38			9.08		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.90											
Intersection LOS	A											

**Intersection Level Of Service Report****Intersection 29:**

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

Delay (sec / veh): 10.1  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.047

**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	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	31	11	1	58	0	12	0	50	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	31	11	1	58	0	12	0	50	32	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	8	3	0	16	0	3	0	14	9	0	0
Total Analysis Volume [veh/h]	17	34	12	1	63	0	13	0	54	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	7.31	0.00	0.00	9.66	10.16	8.87	10.06	10.08	8.73
Movement LOS	A	A	A	A	A	A	A	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.03	0.03	0.03	0.00	0.00	0.00	0.22	0.22	0.22	0.15	0.15	0.15
95th-Percentile Queue Length [ft/ln]	0.75	0.75	0.75	0.04	0.04	0.04	5.61	5.61	5.61	3.68	3.68	3.68
d_A, Approach Delay [s/veh]	1.99			0.11			9.03			10.06		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	4.76											
Intersection LOS	B											



### Intersection Level Of Service Report

#### Intersection 30: 42nd Avenue/Reserve Loop

Control Type:	Two-way stop	Delay (sec / veh):	14.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.057

#### 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	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	Reserve Loop		Reserve Loop		42nd Avenue	
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	195	37	82	58	21	209
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]	195	37	82	58	21	209
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]	53	10	22	16	6	57
Total Analysis Volume [veh/h]	212	40	89	63	23	227
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
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	0.15	0.00	0.00	0.00	0.06	0.24
d_M, Delay for Movement [s/veh]	7.84	0.00	0.00	0.00	14.50	10.11
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.44	0.44	0.00	0.00	0.18	0.96
95th-Percentile Queue Length [ft/ln]	10.95	10.95	0.00	0.00	4.54	23.93
d_A, Approach Delay [s/veh]	6.59		0.00		10.51	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	6.56					
Intersection LOS	B					



### Intersection Level Of Service Report

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

Control Type:	Two-way stop	Delay (sec / veh):	13.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.263

#### 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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	166	131	48	20	56	165
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]	166	131	48	20	56	165
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]	45	36	13	5	15	45
Total Analysis Volume [veh/h]	180	142	52	22	61	179
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	0.26	0.16	0.04	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.64	12.40	7.82	0.00	0.00	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.10	2.10	0.12	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	52.57	52.57	3.06	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.09		5.50		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	7.27					
Intersection LOS	B					



**Intersection Level Of Service Report****Intersection 41:**

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

Delay (sec / veh): 10.2  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.024

**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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	67	6	0	187
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]	16	0	67	6	0	187
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]	4	0	18	2	0	51
Total Analysis Volume [veh/h]	17	0	73	7	0	203
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	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.19	8.78	0.00	0.00	7.37	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.84	1.84	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.19		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.58					
Intersection LOS	B					

**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):	0.073

**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	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	194	0	0	0	0	0	0	73
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	194	0	0	0	0	0	0	73
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	2	53	0	0	0	0	0	0	20
Total Analysis Volume [veh/h]	0	0	0	10	211	0	0	0	0	0	0	79
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
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	0.07	
d_M, Delay for Movement [s/veh]	7.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.83	10.38	8.58
Movement LOS	A	A				A	A				A	B	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	0.12	0.24
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	2.94	5.88
d_A, Approach Delay [s/veh]	3.82			0.00			0.00			8.58			
Approach LOS	A			A			A			A			
d_I, Intersection Delay [s/veh]	2.34												
Intersection LOS	A												

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

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.206

**Intersection Setup**

Name	38th Parkway		The Aurora Highlands 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	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		The Aurora Highlands 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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	194	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]	194	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]	53	0	0	0	0	0
Total Analysis Volume [veh/h]	211	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	0.21	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.43	0.00	0.00	0.00	0.00	0.00
Movement LOS	A		A	A		
95th-Percentile Queue Length [veh/ln]	0.77	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	19.35	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.43		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]			9.43			
Intersection LOS			A			



### Intersection Level Of Service Report

#### Intersection 46: 48th Avenue/Harvest Road

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.503

#### 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	1	0	1	0	0
Exit Pocket Length [ft]	0.00	300.00	0.00	400.00	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	Harvest Road		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	1162	675	850	1073	966	1407
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	13	15	42	97	126	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
Right Turn on Red Volume [veh/h]	0	461	0	0	0	967
Total Hourly Volume [veh/h]	780	0	603	805	764	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]	212	0	164	219	208	0
Total Analysis Volume [veh/h]	848	0	655	875	830	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	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street	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]	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	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	18	54	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	C	R	L	C	C	R
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	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
g_i, Effective Green Time [s]	22	22	22	14	70	52	52
g / C, Green / Cycle	0.22	0.22	0.22	0.14	0.70	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.18	0.18	0.00	0.14	0.19	0.18	0.00
s, saturation flow rate [veh/h]	3113	1603	1431	4669	4584	4584	1431
c, Capacity [veh/h]	678	349	312	657	3219	2391	746
d1, Uniform Delay [s]	37.38	37.14	0.00	42.96	5.48	13.98	0.00
k, delay calibration	0.11	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	1.00
d2, Incremental Delay [s]	2.78	4.50	0.00	15.79	0.21	0.40	0.00
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.81	0.00	1.00	0.27	0.35	0.00
d, Delay for Lane Group [s/veh]	40.16	41.65	0.00	58.75	5.69	14.37	0.00
Lane Group LOS	D	D	A	E	A	B	A
Critical Lane Group	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.77	6.90	0.00	6.29	2.00	3.60	0.00
50th-Percentile Queue Length [ft/ln]	169.26	172.60	0.00	157.31	50.11	90.02	0.00
95th-Percentile Queue Length [veh/ln]	11.04	11.21	0.00	10.41	3.61	6.48	0.00
95th-Percentile Queue Length [ft/ln]	275.94	280.33	0.00	260.15	90.19	162.03	0.00

**Movement, Approach, & Intersection Results**

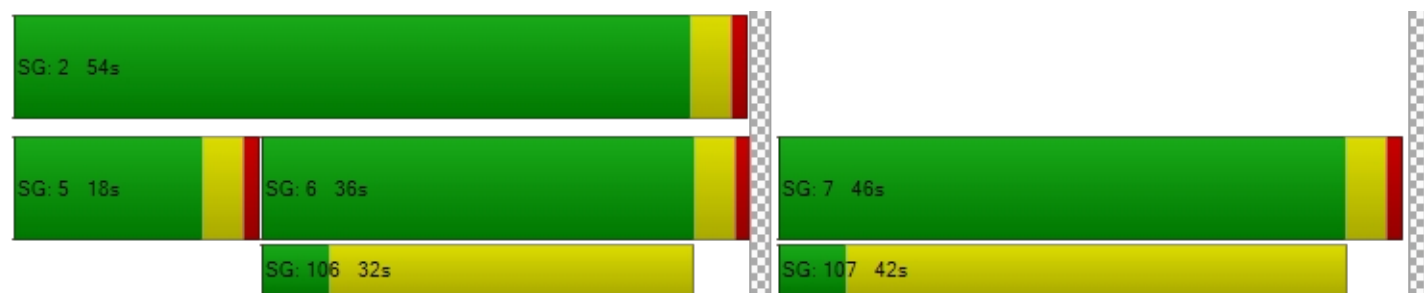
d_M, Delay for Movement [s/veh]	40.65	20.82	58.75	5.69	14.37	0.00
Movement LOS	D	C	E	A	B	A
d_A, Approach Delay [s/veh]	40.65		28.40		14.37	
Approach LOS	D		C		B	
d_I, Intersection Delay [s/veh]	28.01					
Intersection LOS	C					
Intersection V/C	0.503					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	41.41	41.41	41.41
I_p,int, Pedestrian LOS Score for Intersection	3.745	3.248	4.466
Crosswalk LOS	D	C	E
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	840	1000	640
d_b, Bicycle Delay [s]	16.82	12.50	23.12
I_b,int, Bicycle LOS Score for Intersection	3.719	2.401	2.548
Bicycle LOS	D	B	B

**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):	47.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.652

#### 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]	200.00	100.00	100.00	200.00	100.00	200.00	200.00	100.00	100.00	200.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	300.00	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	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	843	531	511	417	422	60	140	617	910	210	272	149
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	12	17	0	4	17	44	62	12	6	22	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	264	0	0	39	0	0	922	0	0	75
Total Hourly Volume [veh/h]	850	543	264	417	426	38	184	679	0	216	294	74
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	231	148	72	113	116	10	50	185	0	59	80	20
Total Analysis Volume [veh/h]	924	590	287	453	463	41	200	738	0	235	320	80
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	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	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	34	36	0	37	39	0	21	40	0	17	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]	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]	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]	28	48	48	22	42	42	11	32	32	12	34	34
g / C, Green / Cycle	0.22	0.37	0.37	0.17	0.32	0.32	0.08	0.25	0.25	0.09	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.20	0.18	0.20	0.15	0.14	0.03	0.06	0.23	0.00	0.08	0.10	0.06
s, saturation flow rate [veh/h]	4669	3204	1431	3113	3204	1431	3113	3204	1431	3113	3204	1431
c, Capacity [veh/h]	1012	1191	532	517	1029	459	252	796	355	282	827	369
d1, Uniform Delay [s]	49.71	31.46	32.11	52.89	35.03	30.86	58.67	47.72	0.00	58.14	39.76	37.91
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]	3.67	1.47	3.90	4.87	1.42	0.38	5.56	5.36	0.00	6.30	0.30	0.29
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	0.50	0.54	0.88	0.45	0.09	0.79	0.93	0.00	0.83	0.39	0.22
d, Delay for Lane Group [s/veh]	53.39	32.94	36.01	57.76	36.46	31.24	64.23	53.07	0.00	64.44	40.06	38.20
Lane Group LOS	D	C	D	E	D	C	E	D	A	E	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	10.10	7.41	7.69	7.57	6.06	0.96	3.43	12.21	0.00	4.05	4.28	2.05
50th-Percentile Queue Length [ft/ln]	252.45	185.24	192.27	189.20	151.53	24.07	85.85	305.35	0.00	101.37	107.02	51.36
95th-Percentile Queue Length [veh/ln]	15.31	11.87	12.24	12.08	10.10	1.73	6.18	17.95	0.00	7.30	7.67	3.70
95th-Percentile Queue Length [ft/ln]	382.74	296.84	305.98	301.99	252.47	43.32	154.53	448.64	0.00	182.47	191.85	92.45

**Movement, Approach, & Intersection Results**

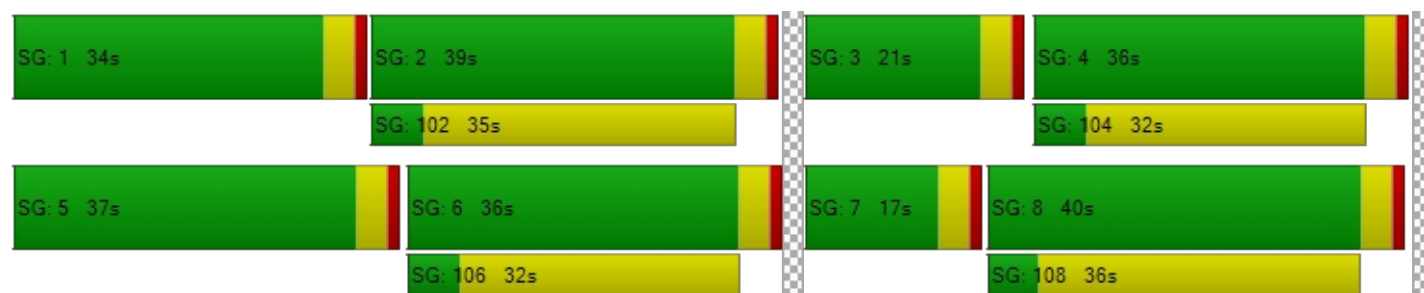
d_M, Delay for Movement [s/veh]	53.39	32.94	36.01	57.76	36.46	31.24	64.23	53.07	0.00	64.44	40.06	38.20
Movement LOS	D	C	D	E	D	C	E	D	A	E	D	D
d_A, Approach Delay [s/veh]	43.92			46.32			55.45			48.85		
Approach LOS	D			D			E			D		
d_I, Intersection Delay [s/veh]	47.67											
Intersection LOS	D											
Intersection V/C	0.652											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	56.32			56.32			56.32			56.32		
I_p,int, Pedestrian LOS Score for Intersection	3.561			3.036			4.370			3.061		
Crosswalk LOS	D			C			E			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]	492			538			554			492		
d_b, Bicycle Delay [s]	36.94			34.72			33.99			36.94		
I_b,int, Bicycle LOS Score for Intersection	3.263			2.381			3.094			2.145		
Bicycle LOS	C			B			C			B		

**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):	30.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

#### 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]	150.00	100.00	150.00	150.00	100.00	150.00	200.00	100.00	200.00	200.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	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	1449	614	518	996	24	66	113	132	151	31	127
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	78	7	0	0	12	10	29	0	225	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	17	0	0	179	0	0	64
Total Hourly Volume [veh/h]	151	1456	307	518	1008	17	95	113	178	151	31	63
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	396	83	141	274	5	26	31	48	41	8	17
Total Analysis Volume [veh/h]	164	1583	334	563	1096	18	103	123	193	164	34	68
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	ProtPer	Permis	Permis	Protect	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis
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]	10	30	0	25	45	0	10	43	0	12	45	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]	73	48	48	21	63	63	29	17	17	8	19	19
g / C, Green / Cycle	0.66	0.43	0.43	0.19	0.57	0.57	0.27	0.16	0.16	0.07	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.28	0.35	0.23	0.18	0.24	0.01	0.08	0.07	0.13	0.05	0.02	0.05
s, saturation flow rate [veh/h]	583	4584	1431	3113	4584	1431	1285	1683	1431	3113	1683	1431
c, Capacity [veh/h]	414	1991	621	595	2613	815	418	268	228	219	293	249
d1, Uniform Delay [s]	8.81	26.92	22.99	43.98	13.38	10.31	31.73	42.00	45.00	50.22	38.33	39.43
k, delay calibration	0.48	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]	2.68	3.39	3.32	8.56	0.50	0.05	0.30	1.23	8.50	5.07	0.17	0.59
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	0.40	0.80	0.54	0.95	0.42	0.02	0.25	0.46	0.85	0.75	0.12	0.27
d, Delay for Lane Group [s/veh]	11.48	30.30	26.31	52.54	13.88	10.36	32.04	43.23	53.51	55.29	38.50	40.01
Lane Group LOS	B	C	C	D	B	B	C	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.67	12.22	6.84	8.22	5.03	0.20	2.19	3.12	5.63	2.37	0.79	1.64
50th-Percentile Queue Length [ft/ln]	41.69	305.57	171.08	205.38	125.82	4.95	54.77	78.03	140.78	59.14	19.76	40.94
95th-Percentile Queue Length [veh/ln]	3.00	17.96	11.13	12.92	8.71	0.36	3.94	5.62	9.52	4.26	1.42	2.95
95th-Percentile Queue Length [ft/ln]	75.05	448.91	278.33	322.89	217.81	8.90	98.58	140.45	238.07	106.44	35.57	73.70

**Movement, Approach, & Intersection Results**

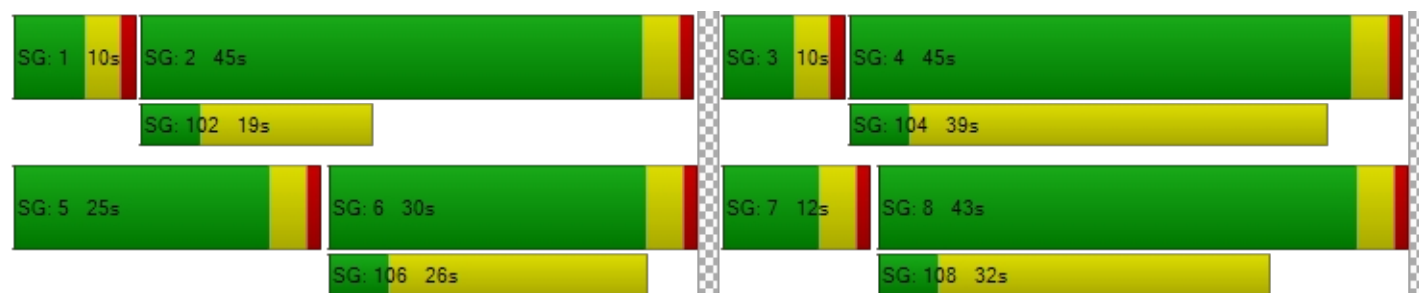
d_M, Delay for Movement [s/veh]	11.48	30.30	26.31	52.54	13.88	10.36	32.04	43.23	53.51	55.29	38.50	40.01
Movement LOS	B	C	C	D	B	B	C	D	D	E	D	D
d_A, Approach Delay [s/veh]	28.18			26.82			45.21			49.24		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.53											
Intersection LOS	C											
Intersection V/C	0.714											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	3.663			3.372			2.737			2.824		
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]	473			745			709			745		
d_b, Bicycle Delay [s]	32.10			21.66			22.94			21.66		
I_b,int, Bicycle LOS Score for Intersection	2.873			2.491			2.546			2.104		
Bicycle LOS	C			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 1: 48th Avenue/Main Street

Control Type:	Signalized	Delay (sec / veh):	45.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.613

#### 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]	325.00	100.00	400.00	250.00	100.00	250.00	300.00	100.00	400.00
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	400.00
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						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	350	32	400	409	26	155	465	1793	440	230	1519	366
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	0	19	0	0	0	0	325	14	4	179	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	142	0	0	102	0	0	152	0	0	121
Total Hourly Volume [veh/h]	249	21	141	270	17	0	307	1508	152	156	1182	121
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	6	38	73	5	0	83	410	41	42	321	33
Total Analysis Volume [veh/h]	271	23	153	293	18	0	334	1639	165	170	1285	132
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	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	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	18	43	0	18	43	0	20	55	0	14	49	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]	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]	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]	13	41	41	14	41	41	16	50	50	9	44	44
g / C, Green / Cycle	0.10	0.31	0.31	0.11	0.32	0.32	0.12	0.39	0.39	0.07	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.09	0.01	0.11	0.09	0.01	0.00	0.11	0.36	0.12	0.05	0.28	0.09
s, saturation flow rate [veh/h]	3113	1683	1431	3113	1683	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	317	527	448	336	537	457	378	1772	553	217	1534	479
d1, Uniform Delay [s]	57.45	31.10	34.35	57.11	30.46	0.00	56.21	38.09	27.66	59.53	39.99	31.71
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]	6.59	0.16	2.07	7.05	0.12	0.00	6.92	2.52	0.30	6.17	1.29	0.31
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	0.04	0.34	0.87	0.03	0.00	0.88	0.93	0.30	0.79	0.84	0.28
d, Delay for Lane Group [s/veh]	64.04	31.26	36.42	64.16	30.58	0.00	63.14	40.61	27.96	65.70	41.27	32.01
Lane Group LOS	E	C	D	E	C	A	E	D	C	E	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.68	0.53	4.02	5.07	0.41	0.00	5.76	16.79	3.64	2.95	12.76	3.11
50th-Percentile Queue Length [ft/ln]	116.92	13.36	100.40	126.83	10.31	0.00	144.00	419.63	90.92	73.69	318.89	77.83
95th-Percentile Queue Length [veh/ln]	8.22	0.96	7.23	8.77	0.74	0.00	9.70	23.50	6.55	5.31	18.61	5.60
95th-Percentile Queue Length [ft/ln]	205.58	24.05	180.72	219.18	18.56	0.00	242.40	587.60	163.65	132.64	465.32	140.09

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	64.04	31.26	36.42	64.16	30.58	0.00	63.14	40.61	27.96	65.70	41.27	32.01
Movement LOS	E	C	D	E	C	A	E	D	C	E	D	C
d_A, Approach Delay [s/veh]	52.90			62.22			43.15			43.12		
Approach LOS	D			E			D			D		
d_I, Intersection Delay [s/veh]	45.44											
Intersection LOS	D											
Intersection V/C	0.613											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	2.852			2.783			3.587			3.467		
Crosswalk LOS	C			C			D			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]	600			600			785			692		
d_b, Bicycle Delay [s]	31.85			31.85			24.01			27.79		
I_b,int, Bicycle LOS Score for Intersection	2.531			2.241			2.819			2.499		
Bicycle LOS	B			B			C			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):	44.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

#### 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]	350.00	100.00	250.00	350.00	100.00	300.00	250.00	100.00	450.00	400.00	100.00	200.00
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	100.00	0.00	0.00	300.00
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			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	658	284	462	223	279	257	220	1532	846	500	1195	149
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	73	17	12	38	28	0	0	208	135	19	109	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
Right Turn on Red Volume [veh/h]	0	0	317	0	0	85	0	0	347	0	0	60
Total Hourly Volume [veh/h]	507	204	0	185	212	85	145	1219	346	349	898	59
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	138	55	0	50	58	23	39	331	94	95	244	16
Total Analysis Volume [veh/h]	551	222	0	201	230	92	158	1325	376	379	976	64
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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]	160
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	Protect	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	41	63	0	21	43	0	44	43	0	33	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	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]	160	160	160	160	160	160	160	160	160	160	160	160
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]	31	28	28	49	14	14	10	77	77	22	88	88
g / C, Green / Cycle	0.19	0.18	0.18	0.31	0.09	0.09	0.07	0.48	0.48	0.14	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.18	0.07	0.00	0.16	0.07	0.06	0.05	0.29	0.26	0.12	0.21	0.04
s, saturation flow rate [veh/h]	3113	3204	1431	1260	3204	1431	3113	4584	1431	3113	4584	1431
c, Capacity [veh/h]	598	564	252	389	289	129	204	2205	688	424	2530	789
d1, Uniform Delay [s]	63.35	58.31	0.00	44.17	71.24	70.67	73.52	30.27	29.20	67.87	20.39	16.80
k, delay calibration	0.11	0.11	0.11	0.14	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]	6.40	0.45	0.00	1.35	4.94	7.07	6.21	1.22	3.10	6.71	0.45	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	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	0.92	0.39	0.00	0.52	0.79	0.71	0.78	0.60	0.55	0.89	0.39	0.08
d, Delay for Lane Group [s/veh]	69.75	58.76	0.00	45.52	76.18	77.74	79.73	31.50	32.30	74.58	20.83	17.00
Lane Group LOS	E	E	A	D	E	E	E	C	C	E	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	11.57	4.05	0.00	6.55	4.85	3.94	3.39	12.79	10.89	8.05	7.14	1.18
50th-Percentile Queue Length [ft/ln]	289.32	101.36	0.00	163.74	121.20	98.58	84.78	319.67	272.20	201.24	178.46	29.61
95th-Percentile Queue Length [veh/ln]	17.15	7.30	0.00	10.75	8.46	7.10	6.10	18.65	16.30	12.70	11.52	2.13
95th-Percentile Queue Length [ft/ln]	428.80	182.45	0.00	268.67	211.47	177.45	152.61	466.28	407.48	317.56	288.00	53.29

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	69.75	58.76	0.00	45.52	76.18	77.74	79.73	31.50	32.30	74.58	20.83	17.00
Movement LOS	E	E	A	D	E	E	E	C	C	E	C	B
d_A, Approach Delay [s/veh]	66.59			64.67			35.76			35.01		
Approach LOS	E			E			D			D		
d_I, Intersection Delay [s/veh]	44.05											
Intersection LOS	D											
Intersection V/C	0.660											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	71.21			71.21			71.21			71.21		
I_p,int, Pedestrian LOS Score for Intersection	3.411			2.783			3.795			3.458		
Crosswalk LOS	C			C			D			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]	738			488			488			350		
d_b, Bicycle Delay [s]	31.84			45.71			45.71			54.40		
I_b,int, Bicycle LOS Score for Intersection	2.459			2.061			2.773			2.373		
Bicycle LOS	B			B			C			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):	26.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.510

#### 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]	200.00	100.00	100.00	150.00	100.00	100.00	40.00	100.00	100.00	175.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	100.00	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	Fultondale Street						48th Avenue			48th Avenue		
Base Volume Input [veh/h]	180	32	130	10	26	26	32	1825	360	310	1638	55
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	89	0	44	0	0	0	0	167	89	66	113	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	65	0	0	9	0	0	164	0	0	18
Total Hourly Volume [veh/h]	208	21	65	7	17	8	21	1372	163	271	1194	18
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	6	18	2	5	2	6	373	44	74	324	5
Total Analysis Volume [veh/h]	226	23	71	8	18	9	23	1491	177	295	1298	20
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	Protect	Permis	Permis	ProtPer	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis
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	30	0	12	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
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
l2, 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]	5	9	9	14	5	68	56	56	8	62	62
g / C, Green / Cycle	0.06	0.10	0.10	0.16	0.06	0.75	0.62	0.62	0.09	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.07	0.01	0.05	0.01	0.02	0.05	0.33	0.12	0.09	0.27	0.27
s, saturation flow rate [veh/h]	3113	1683	1431	1264	1589	453	4584	1431	3113	3204	1670
c, Capacity [veh/h]	176	171	145	303	90	407	2842	887	279	2191	1142
d1, Uniform Delay [s]	42.54	36.90	38.30	32.18	40.84	3.61	9.65	7.43	41.05	6.18	6.18
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
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
d2, Incremental Delay [s]	137.29	0.35	2.53	0.03	1.85	0.26	0.70	0.51	41.58	0.54	1.03
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	1.28	0.13	0.49	0.03	0.30	0.06	0.52	0.20	1.06	0.40	0.40
d, Delay for Lane Group [s/veh]	179.84	37.25	40.83	32.22	42.69	3.88	10.35	7.94	82.62	6.71	7.20
Lane Group LOS	F	D	D	C	D	A	B	A	F	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.29	0.47	1.57	0.15	0.62	0.11	5.04	1.46	4.66	3.12	3.41
50th-Percentile Queue Length [ft/ln]	132.23	11.85	39.18	3.74	15.40	2.64	125.98	36.41	116.58	78.07	85.27
95th-Percentile Queue Length [veh/ln]	9.52	0.85	2.82	0.27	1.11	0.19	8.72	2.62	8.36	5.62	6.14
95th-Percentile Queue Length [ft/ln]	238.01	21.33	70.53	6.73	27.72	4.76	218.02	65.53	208.94	140.53	153.49

**Movement, Approach, & Intersection Results**

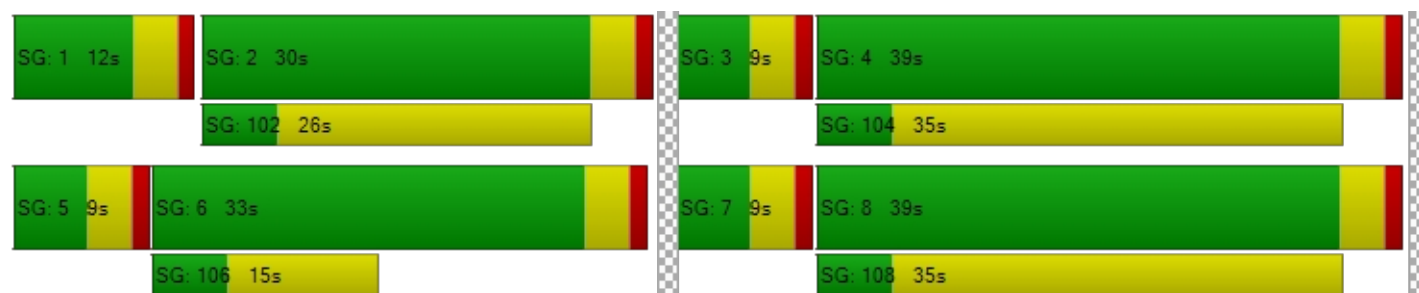
d_M, Delay for Movement [s/veh]	179.84	37.25	40.83	32.22	42.69	42.69	3.88	10.35	7.94	82.62	6.87	7.20
Movement LOS	F	D	D	C	D	D	A	B	A	F	A	A
d_A, Approach Delay [s/veh]	138.74			40.29			10.01			20.73		
Approach LOS	F			D			B			C		
d_I, Intersection Delay [s/veh]	26.28											
Intersection LOS	C											
Intersection V/C	0.510											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	2.716			2.019			3.374			3.152		
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]	777			777			577			644		
d_b, Bicycle Delay [s]	16.84			16.84			22.80			20.71		
I_b,int, Bicycle LOS Score for Intersection	2.195			1.632			2.580			2.457		
Bicycle LOS	B			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 16: 42nd Avenue/Denali Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	1,354.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.497

#### 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	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	Denali Boulevard			Denali Boulevard			42nd Avenue			42nd Avenue		
Base Volume Input [veh/h]	0	1350	0	0	1173	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	157	0	3	4	116	0	0	83	115
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	891	0	157	774	3	4	116	0	0	83	115
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	242	0	43	210	1	1	32	0	0	23	31
Total Analysis Volume [veh/h]	0	968	0	171	841	3	4	126	0	0	90	125
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	0.00	0.01	0.00	0.24	0.01	0.00	0.03	3.50	0.00	0.00	2.51	0.24
d_M, Delay for Movement [s/veh]	9.57	0.00	0.00	11.70	0.00	0.00	31.49	1354.6	1260.9	27.64	957.53	863.97
Movement LOS	A	A	A	B	A	A	D	F	F	D	F	F
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.94	0.00	0.00	0.09	14.50	14.50	0.00	20.94	20.94
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	23.58	0.00	0.00	2.20	362.61	362.61	0.00	523.43	523.43
d_A, Approach Delay [s/veh]	0.00			1.97			1313.92			903.13		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	157.64											
Intersection LOS	F											



### Intersection Level Of Service Report

#### Intersection 17: 42nd Avenue/Fultondale Street

Control Type:	Two-way stop	Delay (sec / veh):	183.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.669

#### 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	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	671	0	0	249	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	83	0	22	28	245	0	0	176	135
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	443	0	83	164	22	28	245	0	0	176	135
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	120	0	23	45	6	8	67	0	0	48	37
Total Analysis Volume [veh/h]	0	482	0	90	178	24	30	266	0	0	191	147
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	0.00	0.00	0.00	0.08	0.00	0.00	0.67	0.98	0.00	0.00	0.71	0.25
d_M, Delay for Movement [s/veh]	7.63	0.00	0.00	8.63	0.00	0.00	183.01	89.71	80.70	720.42	77.86	70.57
Movement LOS	A	A	A	A	A	A	F	F	F	F	F	F
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.27	0.00	0.00	2.55	9.62	9.62	0.00	10.52	10.52
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	6.80	0.00	0.00	63.78	240.43	240.43	0.00	262.99	262.99
d_A, Approach Delay [s/veh]	0.00			2.66			99.17			74.69		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	39.33											
Intersection LOS	F											





### Intersection Level Of Service Report

#### Intersection 20: 42nd Avenue/Main Street

Control Type:	Two-way stop	Delay (sec / veh):	23.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.286

#### 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	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Main Street		Main Street		42nd Avenue	
Base Volume Input [veh/h]	661	0	0	849	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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	28	114	6	13	74	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]	464	114	6	573	74	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]	126	31	2	156	20	3
Total Analysis Volume [veh/h]	504	124	7	623	80	13
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
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	0.01	0.00	0.01	0.01	0.29	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	8.82	0.00	22.96	10.38
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.02	0.00	1.15	0.06
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.56	0.00	28.74	1.46
d_A, Approach Delay [s/veh]	0.00		0.10		21.20	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.50					
Intersection LOS	C					

**Intersection Level Of Service Report****Intersection 23:**

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

Delay (sec / veh): 14.3  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.020

**Intersection Setup**

Name			42nd Avenue		42nd 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	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			42nd Avenue		42nd Avenue	
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	7	12	317	304	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]	7	7	12	317	304	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]	2	2	3	86	83	3
Total Analysis Volume [veh/h]	8	8	13	345	330	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	0.02	0.01	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	14.30	10.33	7.99	0.00	0.00	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.10	0.10	0.03	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.43	2.43	0.81	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	12.31		0.29		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.42					
Intersection LOS	B					



### Intersection Level Of Service Report

#### Intersection 24:

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

Delay (sec / veh): 21.1  
 Level Of Service: C  
 Volume to Capacity (v/c): 0.059

#### 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	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			48th Avenue		48th Avenue	
Base Volume Input [veh/h]	0	0	2235	0	0	2373
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	13	169	33	19	144
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]	19	13	1644	33	19	1710
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	447	9	5	465
Total Analysis Volume [veh/h]	21	14	1787	36	21	1859
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	0.06	0.02	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	21.10	0.00	0.00	0.00	0.00
Movement LOS		C	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.19	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	4.67	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	21.10		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	C					



### Intersection Level Of Service Report

#### Intersection 25: 48th Avenue/PA-31 Street

Control Type:	Two-way stop	Delay (sec / veh):	1,224.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.082

#### 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	0	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]	0	0	2235	0	0	2373
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	82	32	48	134	54	81
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]	82	32	1523	134	54	1647
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]	22	9	414	36	15	448
Total Analysis Volume [veh/h]	89	35	1655	146	59	1790
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	3.08	0.14	0.02	0.00	0.37	0.02
d_M, Delay for Movement [s/veh]	1224.64	22.41	0.00	0.00	40.89	0.00
Movement LOS	F	C	A	A	E	A
95th-Percentile Queue Length [veh/ln]	10.65	0.50	0.00	0.00	1.59	0.00
95th-Percentile Queue Length [ft/ln]	266.24	12.47	0.00	0.00	39.74	0.00
d_A, Approach Delay [s/veh]	885.30		0.00		1.30	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	29.73					
Intersection LOS	F					








### Intersection Level Of Service Report

#### Intersection 26: Reserve Loop/PA-31 Street

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.142

#### 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	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	PA-31 Street		Reserve Loop		Reserve Loop	
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	98	90	52	20	34	62
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]	98	90	52	20	34	62
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]	27	24	14	5	9	17
Total Analysis Volume [veh/h]	107	98	57	22	37	67
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	0.14	0.10	0.04	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.58	9.03	7.49	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.49	0.33	0.10	0.10	0.00	0.00
95th-Percentile Queue Length [ft/ln]	12.37	8.20	2.45	2.45	0.00	0.00
d_A, Approach Delay [s/veh]	9.84		5.40		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.30					
Intersection LOS	B					



### Intersection Level Of Service Report Intersection 27:

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	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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	24	71	124	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	71	124	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	19	34	0
Total Analysis Volume [veh/h]	0	13	26	77	135	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]	10.12	9.00	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]	9.00		1.90		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.24					
Intersection LOS	A					

**Intersection Level Of Service Report****Intersection 28:**

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

Delay (sec / veh): 11.0  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.037

**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	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	59	29	48	21	0	4	14	0	33
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	41	24	59	29	48	21	0	4	14	0	33
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	11	7	16	8	13	6	0	1	4	0	9
Total Analysis Volume [veh/h]	4	45	26	64	32	52	23	0	4	15	0	36
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	0.00	0.00	0.00	0.04	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	7.45	0.00	0.00	10.97	11.13	8.80	10.68	11.25	8.83
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	0.12	0.12	0.12	0.13	0.13	0.13	0.19	0.19	0.19
95th-Percentile Queue Length [ft/ln]	0.18	0.18	0.18	3.12	3.12	3.12	3.17	3.17	3.17	4.64	4.64	4.64
d_A, Approach Delay [s/veh]	0.39			3.22			10.65			9.37		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	4.22											
Intersection LOS	B											

**Intersection Level Of Service Report****Intersection 29:**

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

Delay (sec / veh): 11.0  
 Level Of Service: B  
 Volume to Capacity (v/c): 0.037

**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	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	55	61	36	0	46	0	8	0	34	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	61	36	0	46	0	8	0	34	21	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	17	10	0	13	0	2	0	9	6	0	0
Total Analysis Volume [veh/h]	60	66	39	0	50	0	9	0	37	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	0.01	0.00	0.04	0.04	0.00	0.00
d_M, Delay for Movement [s/veh]	7.39	0.00	0.00	7.42	0.00	0.00	10.59	11.14	8.74	10.96	11.01	8.92
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh/ln]	0.11	0.11	0.11	0.00	0.00	0.00	0.16	0.16	0.16	0.11	0.11	0.11
95th-Percentile Queue Length [ft/ln]	2.78	2.78	2.78	0.00	0.00	0.00	3.92	3.92	3.92	2.85	2.85	2.85
d_A, Approach Delay [s/veh]	2.69			0.00			9.10			10.96		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	3.92											
Intersection LOS	B											





### Intersection Level Of Service Report

#### Intersection 30: 42nd Avenue/Reserve Loop

Control Type:	Two-way stop	Delay (sec / veh):	21.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.239

#### 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	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	Reserve Loop		Reserve Loop		42nd Avenue	
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	276	89	60	40	63	261
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]	276	89	60	40	63	261
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]	75	24	16	11	17	71
Total Analysis Volume [veh/h]	300	97	65	43	68	284
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
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	0.00	0.00	0.00	0.24	0.29
d_M, Delay for Movement [s/veh]	7.83	0.00	0.00	0.00	21.57	10.22
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.60	0.60	0.00	0.00	0.91	1.22
95th-Percentile Queue Length [ft/ln]	14.95	14.95	0.00	0.00	22.77	30.52
d_A, Approach Delay [s/veh]	5.92		0.00		12.42	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	7.84					
Intersection LOS	C					



**Intersection Level Of Service Report**  
**Intersection 40: 38th Parkway/Reserve Loop (W)**

Control Type:	Two-way stop	Delay (sec / veh):	26.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.560

**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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	223	83	143	72	42	225
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]	223	83	143	72	42	225
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]	61	23	39	20	11	61
Total Analysis Volume [veh/h]	242	90	155	78	46	245
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	0.56	0.10	0.12	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	26.38	22.16	8.23	0.00	0.00	0.00
Movement LOS	D	C	A	A	A	A
95th-Percentile Queue Length [veh/ln]	4.81	4.81	0.42	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	120.27	120.27	10.39	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	25.24		5.47		0.00	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	11.28					
Intersection LOS	D					

**Intersection Level Of Service Report****Intersection 41:**

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): 0.019

**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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	0	215	19	0	124
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]	11	0	215	19	0	124
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]	3	0	58	5	0	34
Total Analysis Volume [veh/h]	12	0	234	21	0	135
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	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.90	9.65	0.00	0.00	7.75	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.06	0.06	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.47	1.47	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.90		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.33					
Intersection LOS	B					

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

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.234

**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	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
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	127	0	0	0	0	0	0	234
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	127	0	0	0	0	0	0	234
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	2	35	0	0	0	0	0	0	64
Total Analysis Volume [veh/h]	0	0	0	9	138	0	0	0	0	0	0	254
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
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	0.23
d_M, Delay for Movement [s/veh]	7.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.32	10.29	9.33
Movement LOS	A	A			A	A				A	B	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	0.45	0.91
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	11.36	22.73
d_A, Approach Delay [s/veh]	3.75			0.00			0.00			9.33		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	6.04											
Intersection LOS	A											



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

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.135

**Intersection Setup**

Name	38th Parkway		The Aurora Highlands 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	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		The Aurora Highlands 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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	127	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]	127	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]	35	0	0	0	0	0
Total Analysis Volume [veh/h]	138	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	0.13	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.07	0.00	0.00	0.00	0.00	0.00
Movement LOS	A		A	A		
95th-Percentile Queue Length [veh/ln]	0.47	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	11.65	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.07		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]			9.07			
Intersection LOS			A			

**Intersection Level Of Service Report****Intersection 45:**

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): 0.004

**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	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
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	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	368	0	0	306	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	368	0	0	306	0	0	0	0	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	100	0	0	83	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	400	0	0	333	0	0	0	0	0	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	0.00	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]	7.94	0.00	0.00	8.11	0.00	0.00	15.71	15.35	10.08	15.71	15.35	10.54
Movement LOS	A	A	A	A	A	A	C	C	B	C	C	B
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
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
d_A, Approach Delay [s/veh]	0.00			0.00			13.71			13.86		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	0.00											
Intersection LOS	A											



### Intersection Level Of Service Report

#### Intersection 46: 48th Avenue/Harvest Road

Control Type:	Signalized	Delay (sec / veh):	25.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

#### 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	1	0	1	0	0
Exit Pocket Length [ft]	0.00	300.00	0.00	400.00	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	Harvest Road		48th Avenue		48th Avenue	
Base Volume Input [veh/h]	1379	700	800	1166	1282	1348
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	0.6600	0.6600	0.6600	0.6600	0.6600	0.6600
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	43	48	29	159	138	26
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	510	0	0	0	916
Total Hourly Volume [veh/h]	953	0	557	929	984	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]	259	0	151	252	267	0
Total Analysis Volume [veh/h]	1036	0	605	1010	1070	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	0		0		0	
v_di, Inbound Pedestrian Volume crossing major street	0		0		0	
v_co, Outbound Pedestrian Volume crossing minor street	0		0		0	
v_ci, Inbound Pedestrian Volume crossing minor street	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]	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	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	18	54	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	C	R	L	C	C	R
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	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
g_i, Effective Green Time [s]	26	26	26	14	66	48	48
g / C, Green / Cycle	0.26	0.26	0.26	0.14	0.66	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.22	0.22	0.00	0.13	0.22	0.23	0.00
s, saturation flow rate [veh/h]	3113	1603	1431	4669	4584	4584	1431
c, Capacity [veh/h]	811	418	373	656	3023	2195	685
d1, Uniform Delay [s]	35.12	34.84	0.00	42.43	7.44	17.73	0.00
k, delay calibration	0.11	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	1.00
d2, Incremental Delay [s]	2.64	4.21	0.00	5.96	0.30	0.78	0.00
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.83	0.00	0.92	0.33	0.49	0.00
d, Delay for Lane Group [s/veh]	37.76	39.04	0.00	48.39	7.74	18.50	0.00
Lane Group LOS	D	D	A	D	A	B	A
Critical Lane Group	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.13	8.26	0.00	5.23	2.92	5.55	0.00
50th-Percentile Queue Length [ft/ln]	203.30	206.47	0.00	130.67	73.11	138.73	0.00
95th-Percentile Queue Length [veh/ln]	12.81	12.97	0.00	8.98	5.26	9.41	0.00
95th-Percentile Queue Length [ft/ln]	320.21	324.29	0.00	224.41	131.60	235.32	0.00



**Movement, Approach, & Intersection Results**

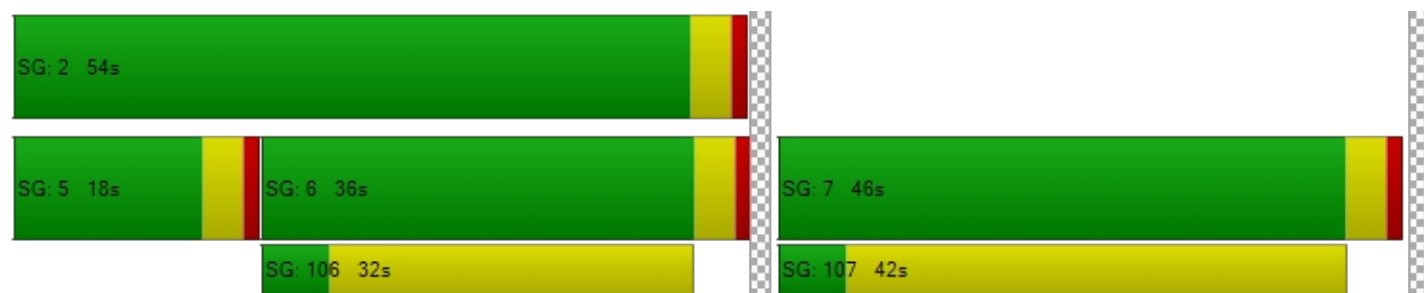
d_M, Delay for Movement [s/veh]	38.19	19.52	48.39	7.74	18.50	0.00
Movement LOS	D	B	D	A	B	A
d_A, Approach Delay [s/veh]	38.19		22.97		18.50	
Approach LOS	D		C		B	
d_I, Intersection Delay [s/veh]	25.92					
Intersection LOS	C					
Intersection V/C	0.585					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	41.41	41.41	41.41
I_p,int, Pedestrian LOS Score for Intersection	3.831	3.285	4.465
Crosswalk LOS	D	C	E
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	840	1000	640
d_b, Bicycle Delay [s]	16.82	12.50	23.12
I_b,int, Bicycle LOS Score for Intersection	4.111	2.448	2.652
Bicycle LOS	D	B	B

**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):	47.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

#### 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]	200.00	100.00	100.00	200.00	100.00	200.00	200.00	100.00	100.00	200.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	300.00	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	Powhatan Road			Powhatan Road			48th Avenue			48th Avenue		
Base Volume Input [veh/h]	941	455	286	155	530	130	90	300	936	240	600	430
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	8	11	0	14	52	30	43	7	19	72	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	149	0	0	91	0	0	943	0	0	215
Total Hourly Volume [veh/h]	952	463	148	155	544	91	120	343	0	259	672	215
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	259	126	40	42	148	25	33	93	0	70	183	58
Total Analysis Volume [veh/h]	1035	503	161	168	591	99	130	373	0	282	730	234
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	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	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
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]	33	36	0	36	39	0	22	40	0	18	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]	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]	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]	29	64	64	9	45	45	8	27	27	14	33	33
g / C, Green / Cycle	0.22	0.49	0.49	0.07	0.34	0.34	0.06	0.21	0.21	0.11	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.11	0.05	0.18	0.07	0.04	0.12	0.00	0.09	0.23	0.16
s, saturation flow rate [veh/h]	4669	3204	1431	3113	3204	1431	3113	3204	1431	3113	3204	1431
c, Capacity [veh/h]	1041	1582	706	225	1099	491	183	658	294	328	808	361
d1, Uniform Delay [s]	50.43	19.77	18.78	59.15	34.41	30.15	60.13	46.47	0.00	57.21	47.09	43.47
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]	11.60	0.53	0.75	4.86	1.89	0.92	5.07	0.77	0.00	6.52	4.11	1.97
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	0.99	0.32	0.23	0.75	0.54	0.20	0.71	0.57	0.00	0.86	0.90	0.65
d, Delay for Lane Group [s/veh]	62.03	20.30	19.53	64.01	36.30	31.07	65.20	47.24	0.00	63.72	51.20	45.44
Lane Group LOS	E	C	B	E	D	C	E	D	A	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	12.28	4.70	2.94	2.87	7.84	2.34	2.24	5.52	0.00	4.86	11.86	6.94
50th-Percentile Queue Length [ft/ln]	306.96	117.61	73.44	71.81	195.97	58.56	56.01	137.95	0.00	121.53	296.42	173.54
95th-Percentile Queue Length [veh/ln]	18.03	8.26	5.29	5.17	12.43	4.22	4.03	9.37	0.00	8.48	17.50	11.26
95th-Percentile Queue Length [ft/ln]	450.63	206.54	132.18	129.26	310.76	105.41	100.82	234.26	0.00	211.92	437.60	281.57

**Movement, Approach, & Intersection Results**

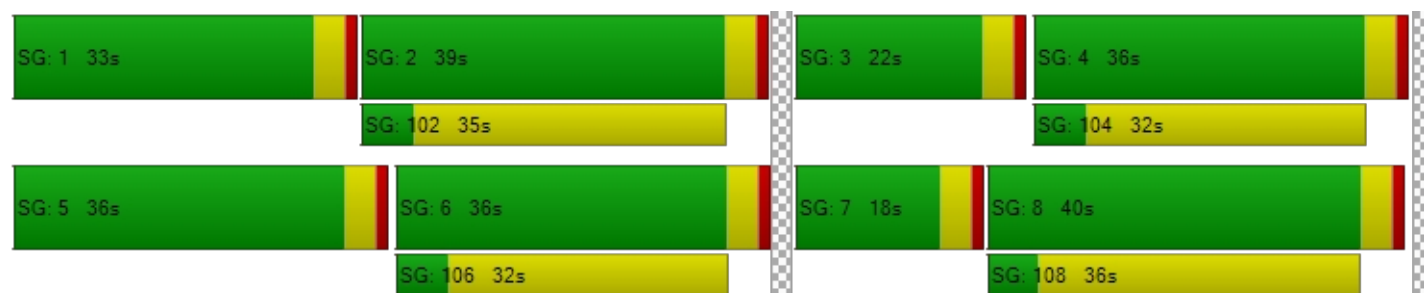
d_M, Delay for Movement [s/veh]	62.03	20.30	19.53	64.01	36.30	31.07	65.20	47.24	0.00	63.72	51.20	45.44
Movement LOS	E	C	B	E	D	C	E	D	A	E	D	D
d_A, Approach Delay [s/veh]	45.65			41.12			51.88			52.95		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	47.59											
Intersection LOS	D											
Intersection V/C	0.676											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	56.32			56.32			56.32			56.32		
I_p,int, Pedestrian LOS Score for Intersection	3.397			3.121			4.408			3.241		
Crosswalk LOS	C			C			E			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]	492			538			554			492		
d_b, Bicycle Delay [s]	36.95			34.72			34.00			36.95		
I_b,int, Bicycle LOS Score for Intersection	3.084			2.343			2.753			2.765		
Bicycle LOS	C			B			C			C		

**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):	52.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.827

#### 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]	150.00	100.00	150.00	150.00	100.00	150.00	200.00	100.00	200.00	200.00	100.00	200.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	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	1180	168	138	1529	65	24	78	83	597	111	492
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	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	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	262	11	0	0	7	33	19	0	155	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	49	0	0	119	0	0	246
Total Hourly Volume [veh/h]	414	1191	84	138	1536	49	43	78	119	597	111	246
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	113	324	23	38	417	13	12	21	32	162	30	67
Total Analysis Volume [veh/h]	450	1295	91	150	1670	53	47	85	129	649	121	267
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	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street	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	ProtPer	Permis	Permis	Protect	Permis	Permis	ProtPer	Permis	Permis	Protect	Permis	Permis
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]	22	39	0	11	28	0	11	36	0	24	49	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]	66	55	55	7	44	44	36	12	12	20	28	28
g / C, Green / Cycle	0.60	0.50	0.50	0.06	0.40	0.40	0.33	0.11	0.11	0.18	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.68	0.28	0.06	0.05	0.36	0.04	0.05	0.05	0.09	0.21	0.07	0.19
s, saturation flow rate [veh/h]	665	4584	1431	3113	4584	1431	1011	1683	1431	3113	1683	1431
c, Capacity [veh/h]	403	2275	710	200	1819	568	377	188	160	567	435	370
d1, Uniform Delay [s]	37.87	19.47	14.92	50.63	31.51	20.80	25.63	45.72	47.71	45.03	32.63	37.23
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]	80.72	1.04	0.37	5.50	8.93	0.33	0.15	1.68	9.09	70.52	0.34	2.68
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	1.12	0.57	0.13	0.75	0.92	0.09	0.12	0.45	0.81	1.15	0.28	0.72
d, Delay for Lane Group [s/veh]	118.59	20.51	15.29	56.13	40.44	21.13	25.77	47.40	56.80	115.56	32.97	39.91
Lane Group LOS	F	C	B	E	D	C	C	D	E	F	C	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	14.10	7.73	1.29	2.18	15.11	0.91	0.87	2.26	3.85	13.21	2.62	6.77
50th-Percentile Queue Length [ft/ln]	352.43	193.36	32.19	54.51	377.83	22.67	21.69	56.52	96.15	330.27	65.53	169.25
95th-Percentile Queue Length [veh/ln]	21.94	12.30	2.32	3.92	21.49	1.63	1.56	4.07	6.92	20.46	4.72	11.04
95th-Percentile Queue Length [ft/ln]	548.43	307.39	57.94	98.12	537.22	40.81	39.04	101.74	173.07	511.41	117.95	275.93

**Movement, Approach, & Intersection Results**

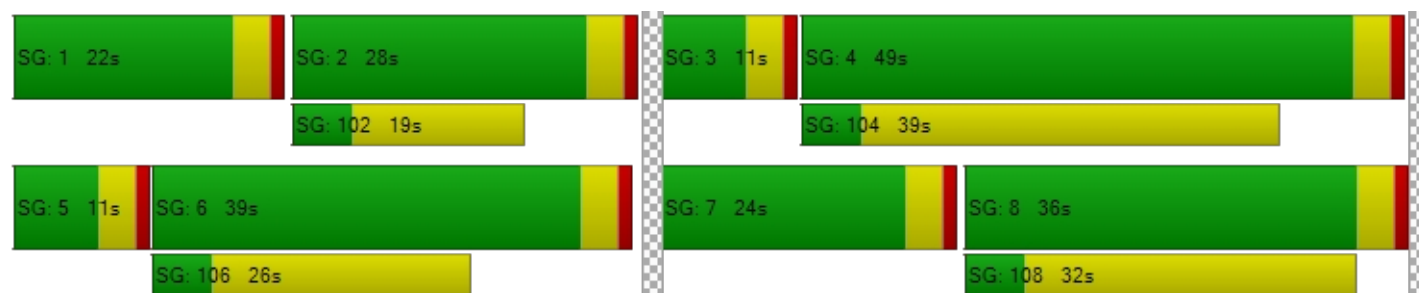
d_M, Delay for Movement [s/veh]	118.59	20.51	15.29	56.13	40.44	21.13	25.77	47.40	56.80	115.56	32.97	39.91
Movement LOS	F	C	B	E	D	C	C	D	E	F	C	D
d_A, Approach Delay [s/veh]	44.29			41.15			48.15			86.44		
Approach LOS	D			D			D			F		
d_I, Intersection Delay [s/veh]	52.05											
Intersection LOS	D											
Intersection V/C	0.827											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /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	3.403			3.434			2.834			3.089		
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]	636			436			582			818		
d_b, Bicycle Delay [s]	25.59			33.64			27.68			19.23		
I_b,int, Bicycle LOS Score for Intersection	2.616			2.617			2.187			3.677		
Bicycle LOS	B			B			B			D		

**Sequence**

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



# **DRAFT**

## **Travel Demand**

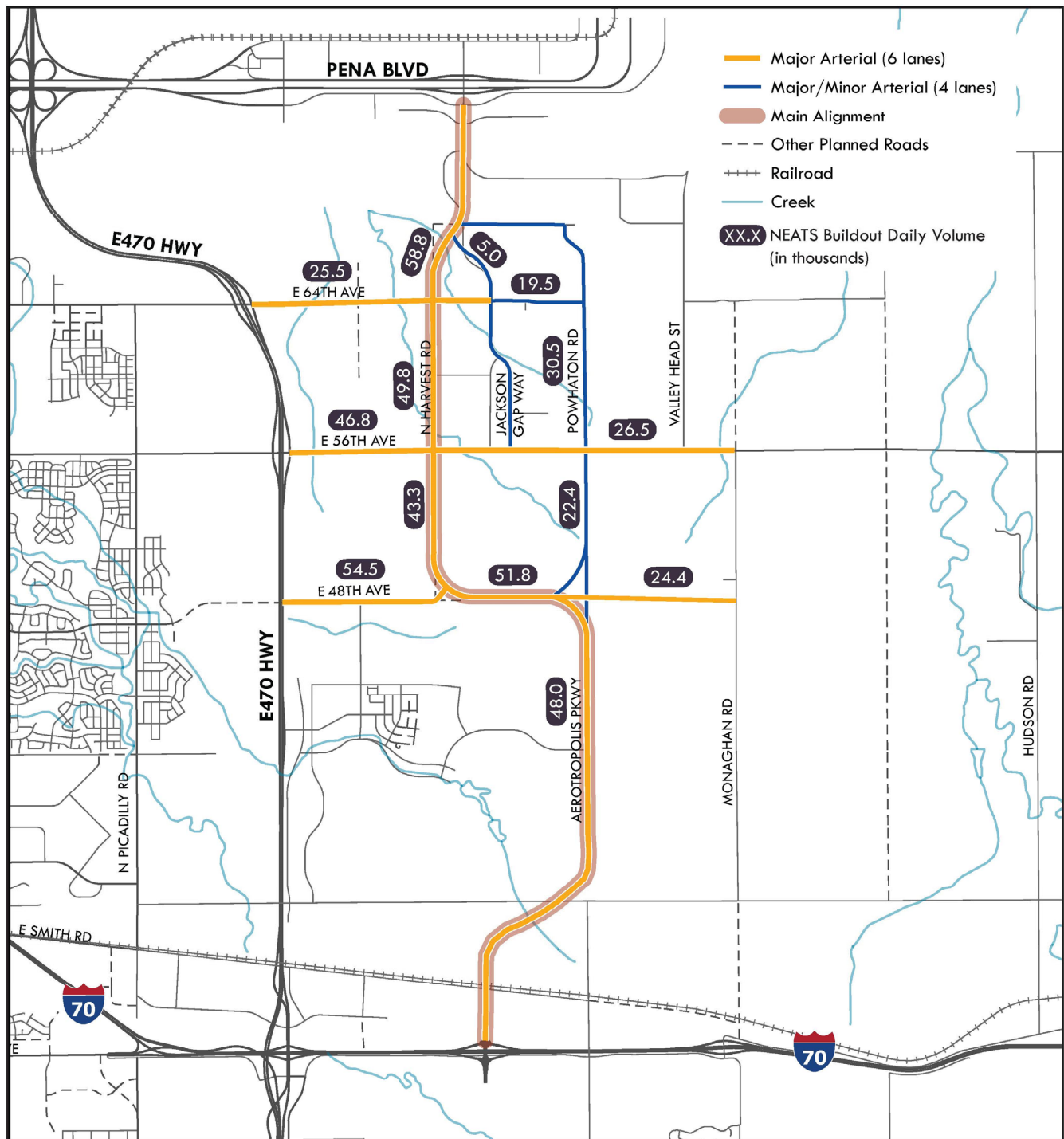
Traffic volume forecasts for the developing northeast area of Aurora were documented in the *NEATS Refresh* for the planning horizons of 2030, 2040 and Buildout. The NEATS Buildout forecasts, shown in **Figure 6**, identify projected ultimate volumes for the northeast area arterial roadway network when full development of this area is completed. Therefore, the NEATS Buildout model was utilized for this alignment study. The NEATS Buildout travel forecasts were based on the NEATS Base Alignment roadway network shown in Figure 2, with the six-lane north-south corridor alignment following Powhaton Road, 48<sup>th</sup> Avenue, and Harvest Road.

Raw Buildout traffic forecasts with the NEATS Optional Alignment were presented in a memorandum regarding the *Sun Empire Development—Effects of Optional Diagonal Connector*, dated July 12, 2021 based on a new model run by Felsburg Holt and Ullevig. With the NEATS Optional Alignment, the diagonal connection from Powhaton to Harvest Road would carry approximately 35,000 to 40,000 vehicles per day (vpd), with less volume on 48<sup>th</sup> Avenue between Harvest and Powhaton Roads than with the Base Alignment. There would also be less traffic volume on Harvest Road north of 48<sup>th</sup> Avenue, since north-south through traffic would use the new diagonal connection.

A similar Buildout forecast model run, with NEATS Buildout land use, was completed for this alignment study, with the Powhaton to Jackson Gap Way diagonal connection and corresponding roadway laneage and facility type adjustments and those raw model forecasts are shown in **Figure 7**. With the Powhaton to Jackson Gap Way Alignment, about 30,000 to 35,000 vpd would utilize the diagonal connection from Powhaton to Jackson Gap Way, so there would be less volume on Harvest Road from 48<sup>th</sup> to 68<sup>th</sup> Avenue than with the Base Alignment.

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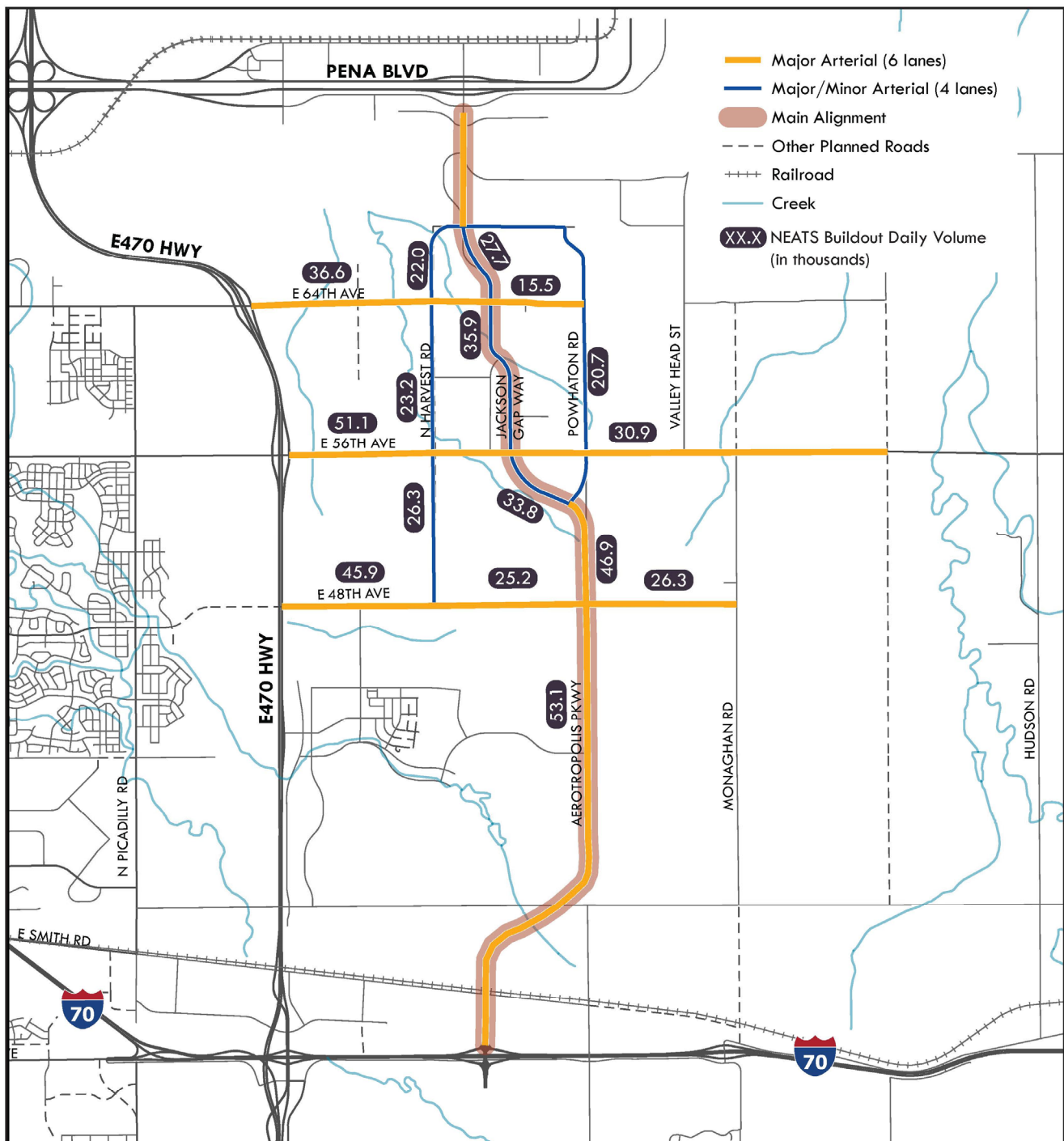
**Figure 6 | NEATS Buildout Volumes**



NEATS Refresh, October 2018.

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**Figure 7 | Buildout Volumes with  
Powhaton to Jackson Gap Way Alignment**



Source: David Evans and Associates, Inc.

## Background Volumes

Step 1) 2040 Total volumes (grey cells) were used to obtain the percentages of each movement

Step 2) It was assumed that MTIS 2040 background ADT on each leg of the intersection was distributed evenly between each bound of the traffic. Also, AM and PM peak each generates 10 percent of the total ADT (Orange cells)

Step 3) product of step 1 and step 2 was used as each movement's TMC

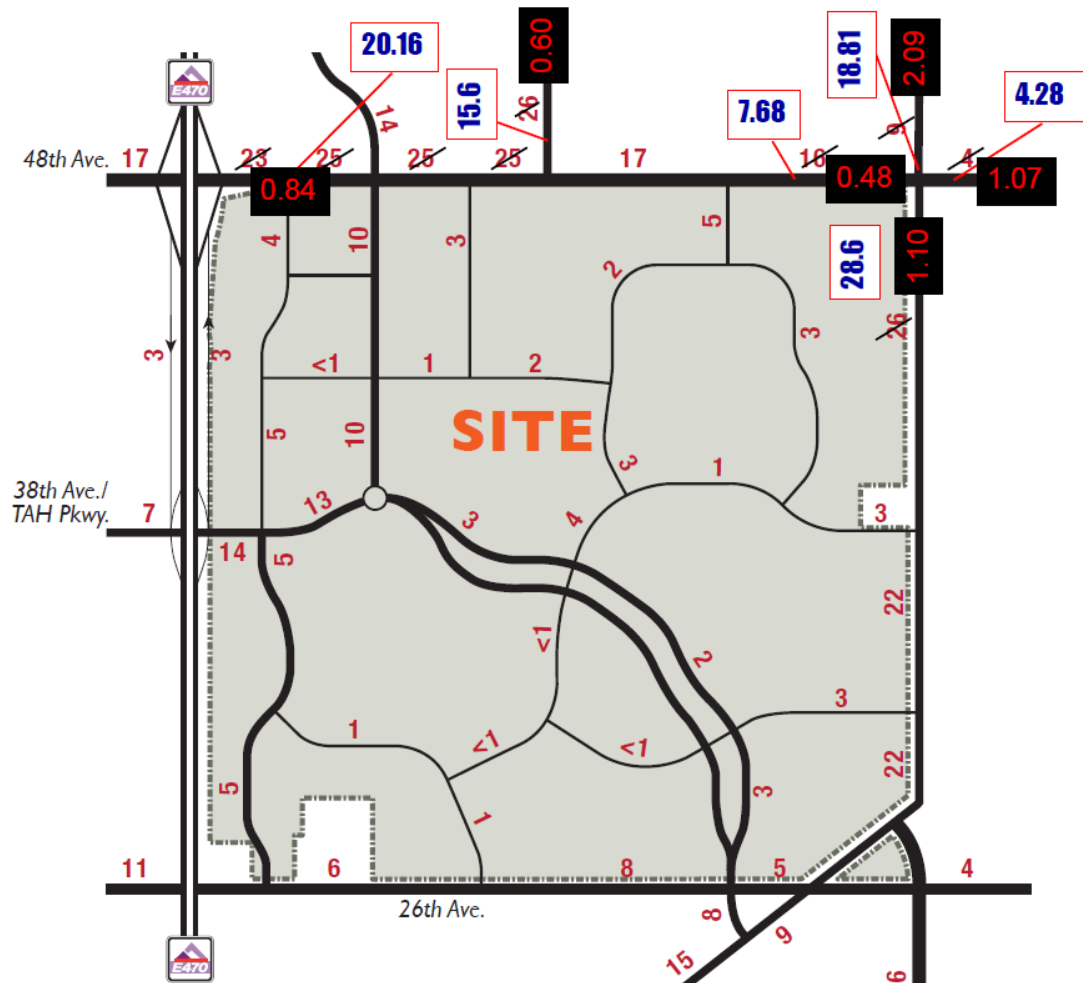
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1			<b>48th Avenue</b>																	
2					AM				PM											
3				Intersection	12				Intersection	12										
4			Main																	
5			EB	LT	188	9%	106	EB	LT	465	0.17235	198								
6			TH	1452	71%	819		TH	1793	0.664566	764									
7			RT	400	20%	225		RT	440	0.163084	188									
8			SUM	2040						2698										
9			From Previous study	FHU BG	1150															
10																				
11			NB	LT	390	0.590015	118	NB	LT	350	0.44757	90								
12			TH	21	0.03177	6		TH	32	0.040921	8									
13			RT	250	0.378215	76		RT	400	0.511509	102									
14			SUM	661						782										
15			FHU BG	200																
16																				
17			WB	LT	420	0.060356	75	WB	LT	230	0.108747	136								
18			TH	1744	0.757273	947		TH	1519	0.718203	898									
19			RT	139	0.182371	228		RT	366	0.17305	216									
20			SUM	2303						2115										
21			FHU BG	1250																
22																				
23			Previous study TMC	SB	LT	260	1.452514	260	SB	LT	409	0.69322	124							
24				TH	29	0.162011	29		TH	26	0.044068	8								
25				RT	79	0.441341	79		RT	155	0.262712	47								
26				SUM	179					590										
27				FHU BG																
28																				
29				Intersection																

## Adjusting for the new Alignment

appropriate factor was applied to each roadway and new ADTs were determined.

(the TMC obtained from the above was also adjusted based on this information)

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



## Powhatan/48<sup>th</sup>

The turning movements on this intersection were adjusted based on the new information regarding the alignment on Powhatan. Since it was impossible to obtain the exact turning movement's volume given the ADTs are known (a system of 12 unknowns and 4 equations) . A set of (near optimum) solutions was found to distribute the trips at this intersection (please see the figure below)



