

TRAFFIC IMPACT ANALYSIS

Aurora Logistics Center (ALC)

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I. INTRODUCTION

The Aurora Logistics Center (ALC) development is an approximate 1,280-acre master plan development proposal located north of Interstate 70 (I-70) in Aurora, as shown on **Figure 1**. The uses will consist primarily of commercial and industrial uses with up to 16.4 million square feet of developed space. Buildout of this Framework Development Plan (FDP) will take many years to complete, possibly beyond the 2045 horizon of this analysis.

The site is rectangular in shape and bounded on the south by 26th Avenue and 48th Avenue on the north. A future extension of Aerotropolis Parkway (along the Powhatan Road land line) will serve as the western boundary of the development, and Monaghan Road will serve as the eastern boundary of the site. **Figure 2** illustrates the proposed FDP site plan.

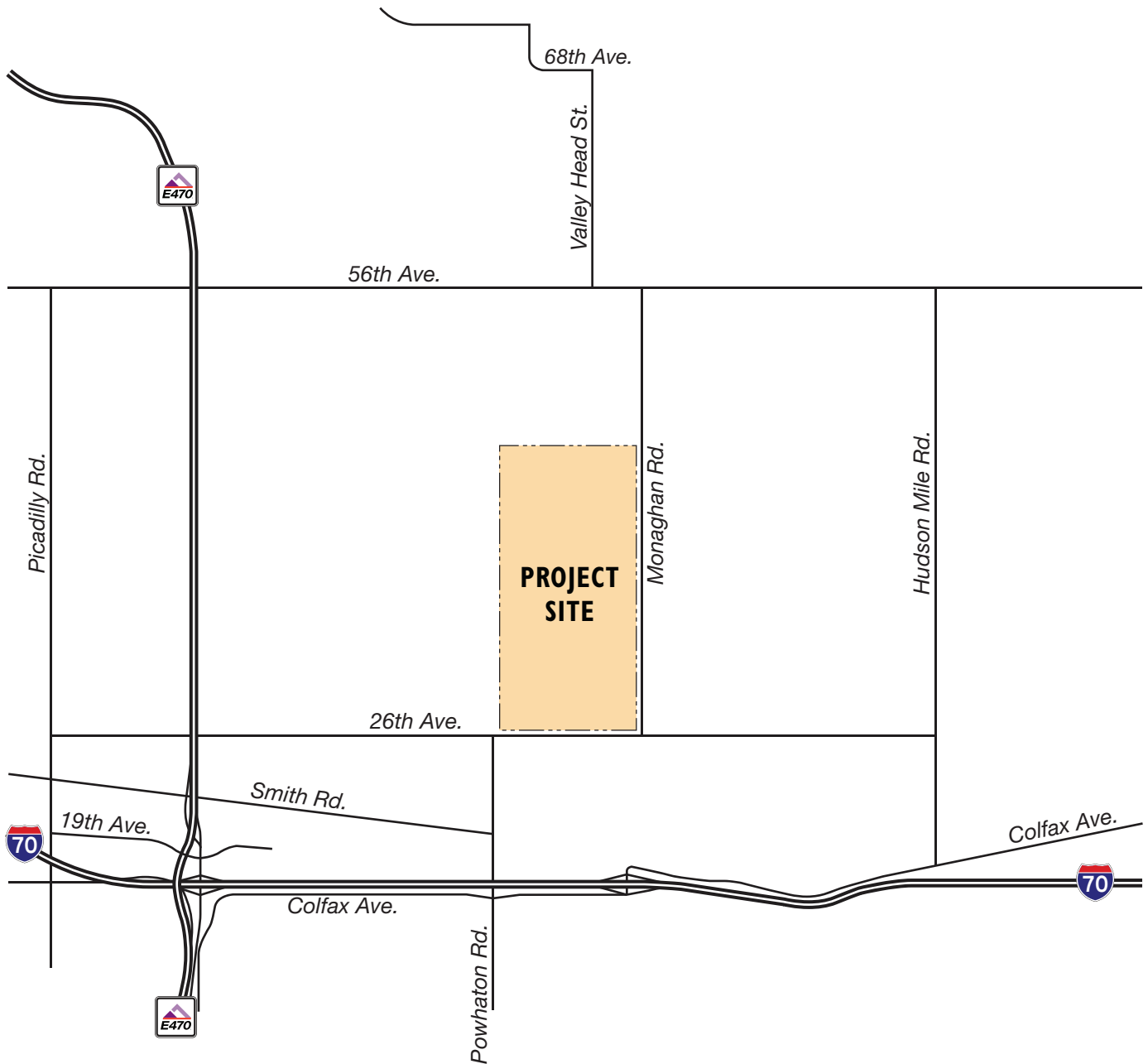
The master plan identifies a total of 25 planning areas (including open spaces parcels), bisected by an interior roadway network. Exact roadway alignments will be determined at the time of Contextual Site Plan (CSP), but roadway connection intentions are presented for the FDP's planning areas, consistent with the City's Roadway Design and Technical Criteria Manual per Section 4.04.1.

Currently, access into the area is limited. In this undeveloped area, 56th Avenue (one mile north of the site) and 26th Avenue are the primary means of access. 56th Avenue provides a direct connection to E-470 to the west. Powhatan Road provides a connection to E. Colfax Avenue to the south, which, in turn, provides a direct connection to I-70 approximately 0.9 mile to the east.

The purpose of this study is to assess the traffic impacts on the key roadways related to the proposed development to support projected traffic volumes. This report includes information on existing traffic conditions, vehicle-trips associated with the planned development, total traffic volume projections, and recommendations on future roadway needs, including supporting analysis for roadway classifications. A maximum development scenario was analyzed with respect to traffic impacts. More detailed traffic impact studies may be appropriate for individual parcels as they are developed.

This analysis focuses on the long-term timeframe, year 2045, using the *Aurora Northeast Area Transportation Study (NEATS) Refresh Transportation Plan* as a means of informing background traffic along study area roadways. More recently, traffic analysis work associated with the 26th Avenue/Powhatan Road/Aerotropolis Parkway intersection was also used as a basis for this study. That study, prepared by AECOM in June 2022, presents long-term traffic projections along the perimeter ALC arterial roadways, and these were used in developing traffic projections in this traffic impact study.

A short-term timeframe was not specifically analyzed in this study because of the many variables associated with the surrounding development and the timing of that development. This study focuses on the long-term timeframe (year 2045) realizing that a roadway improvement phasing plan (in conjunction with other development) will be needed to serve this and the adjoining FDPs.





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ALC Study DEC_23 122-279-01 12/5/23

II. EXISTING CONDITIONS

II.A. Land Use

Currently, the site is undeveloped and lies entirely within the Aurora city limits. The area that immediately surrounds these two sections is undeveloped, but the Aurora Highlands to the west is developing and numerous homes have been built. Green Valley Ranch is a nearby residential area to the west (west of Picadilly Road), and the Majestic Commerce Center is an industrial/warehouse area located immediately south of Green Valley Ranch. Various other small commercial developments exist along I-70 directly south of the master plan, but there is little development near the ALC master plan site.

II.B. Transportation Network

Roadways

Key roadways that currently serve the site include the following:

- **E-470** is a north-south four-lane tollway located 2 miles to the west of the proposed development. A grade-separated interchange is provided at 56th Avenue. An interchange is planned at 48th Avenue where the bridge over E-470 at 48th Avenue is in place. An interchange at 38th Avenue is also underway in conjunction with the development of The Aurora Highlands.
- **26th Avenue** is a minor two-lane roadway facility along the south side of the ALC development that crosses E-470 (no interchange) and extends 7 miles, from Picadilly Road to the west and Watkins Road to the east.
- **Powhaton Road** is a two-lane road that extends south from 26th Avenue as a two-lane facility, crossing the Union Pacific Railroad (UPRR) at-grade, spanning I-70, and extending south approximately 5 miles to Jewell Avenue. The northern extension of Powhaton Road north of 26th Avenue will ultimately define the west side of the development, but this road is not yet built.
- **Monaghan Road** is an existing two-lane road that serves as the eastern boundary for the proposed development. Monaghan Road extends 3 miles from 26th Avenue to 56th Avenue.

A key future roadway worth noting is Jackson Gap Way. Ultimately, Jackson Gap Way will serve as the primary entrance north into Denver International Airport (DEN), continuing south, winding east to the Aerotropolis Parkway/Powhaton Road alignment, and connecting to I-70 via an interchange as a diagonal roadway toward the southwest from the Aerotropolis/Powhaton/26th Avenue intersection. The planned roadway network through the area contains many of the elements identified in the current NEATS study with respect to arterial roads.

Traffic Volumes and Operations

Since the area in the immediate vicinity of the ALC FDP is undeveloped, there is little existing traffic on the roadway network. Traffic counts were not specifically collected since only a portion of the ultimate network exists and the surrounding area is largely rural. Roadways that do exist are thought to serve relatively light traffic. A review of existing traffic in the area in the NEATS study shows that volumes tend to be under 1,000 vehicles per day. Precise existing traffic counts are not critical in this study given the lack of network and lack of development today. Existing traffic is not being used here in developing projections.

III. FUTURE ROADWAY NETWORK

In 2018, the City of Aurora completed the *NEATS Refresh* study, and subsequently the City commissioned a Powhaton Road Alignment study that concluded in 2021. The 2021 study served as an update to the 2018 *NEATS Refresh* study with respect to Year 2040 and Regional Buildout transportation recommendations for the roadways and a multimodal transportation system. The NEATS study area encompassed a regional area extending from approximately Tower Road east to Schumaker Road, and from Jewell Avenue on the south to 72nd Avenue on the north. Recommendations with respect to the ALC FDP include:

- **26th Avenue** would be designated as a four-lane minor arterial plus turn lanes. The existing grade separation over E-470 will be maintained to the west, and 26th Avenue would continue to end at Watkins Road to the east. Signalized and roundabout intersections would be allowed at a minimum of one-eighth-mile spacing with other public or private access usually restricted to right-in/right-out intersections spaced at a minimum of 300 feet from other intersections.
- **38th Avenue** would be a collector street with turn lanes as required serving the ALC development, from Monaghan Road through ALC to Aerotropolis Parkway and into the adjacent Aurora Highlands development. Signalized, roundabout and stop-controlled intersections would be allowed at a minimum one-eighth-mile spacing, with some restrictions on other public or private access intersections.
- **48th Avenue** would be designated as a major arterial with turn lanes between Monaghan Road and Aerotropolis Parkway. West of Aerotropolis Parkway, 48th Avenue would be a six-lane major arterial with turn lanes through the interchange with E-470 to the intersection with Picadilly Road. A four-lane facility is planned east of Aerotropolis Parkway. At-grade signalized intersections would be allowed at a minimum of one-eighth-mile spacing. Public or private access would be restricted to right-in/right-out intersections spaced at a minimum of 300 feet from each other from other intersections.
- **Aerotropolis Parkway (Powhaton Road)** would be designated as a six-lane major arterial with turn lanes along the western boundary of the ALC FDP, from 26th Avenue to 48th Avenue. North of 48th Avenue, the designation would continue as a six-lane major arterial as it winds to the west into the Jackson Gap Way alignment as the major primary north entrance into DEN. To the south of 26th Avenue, the designation would remain as a six-lane major arterial with turn lanes. A new grade separation over the UPRR would be constructed, and the existing grade separation over I-70 would remain. At-grade signalized intersections would be allowed at one-half-mile spacing with other public or private access usually restricted to right-in/right-out intersections with auxiliary turn lanes.
- **Monaghan Road**, immediately adjacent to the ALC FDP, would be designated as a four-lane minor arterial with turn lanes from 26th Avenue north to 64th Avenue. To the south, Monaghan Road would be extended as a major arterial with turn lanes to include a grade separation over the UPRR and tie into an interchange with I-70. South of the interstate, Monaghan Road would continue as a major arterial to Jewell Avenue. Signalized and roundabout intersections would be allowed at a minimum one-eighth-mile spacing with other public or private access usually restricted to right-in/right-out intersections.

- **Aerotropolis Parkway/Harvest Road** is proposed to be a six-lane major arterial with turn lanes from its current southern terminus at East 6th Avenue, continuing north through a new interchange with I-70, a grade separation over the UPRR, and its transition to the northeast to tie into Powhatan Road near the intersection with 26th Avenue as indicated in the current *NEATS Refresh*. Given the diagonal roadway south of 26th Avenue that will lead to the I-70/Harvest Road interchange, AECOM conducted more analysis that identified a diverging diamond interchange layout, which is the basis of analysis of this report. North of 26th Avenue, at-grade signalized intersections would be allowed at one-half-mile spacing with other public or private access usually restricted to right-in/right-out intersections.

Access-wise, development within the ALC FDP will primarily be served by 32nd Avenue, 38th Avenue, 42nd Avenue, and the north-south collector road. Aerotropolis Parkway will be access-limited, and direct access onto the other perimeter arterials will be controlled, and some may include turn restrictions.

IV. FUTURE PROJECTED CONDITIONS

This traffic study assesses the traffic conditions and impacts associated with the full buildout of the master plan. The intent is to assess the lane configuration of the major roadway network adjacent to the FDP and the collector roads planned to be built within. The buildout scenario assesses year 2045 conditions being informed by the *NEATS Refresh* buildout traffic volume projections and projections shown in the AECOM June 2, 2022, Traffic Forecasting Memorandum previously referenced. The AECOM memo refers to “Full Build 2040 Model,” possibly implying that “2040” and Buildout are interchangeable terms. Their daily traffic forecasts far exceed the NEATS 2040 projections and are in line with the NEATS buildout forecasts. The AECOM traffic projections are thought to represent Buildout of the area, which this study has adopted as being the 2045 traffic projections.

The long-term analysis assesses the road system given daily traffic projections and peak hour traffic projections at the perimeter roadways. The same analyses incorporate the potential of ALC being built out to its maximum density. As individual parcels develop, a more refined traffic impact study may be appropriate to assess access specifics and/or to update information presented in this report. Traffic projections shown in this study are based on the premise that ALC would be built out to its maximum densities per the FDP proposal (and FAR=0.35). Traffic demands associated with the remainder of the area and region are based on the raw projections shown in the AECOM memo.

IV.A. Site Trip Generation

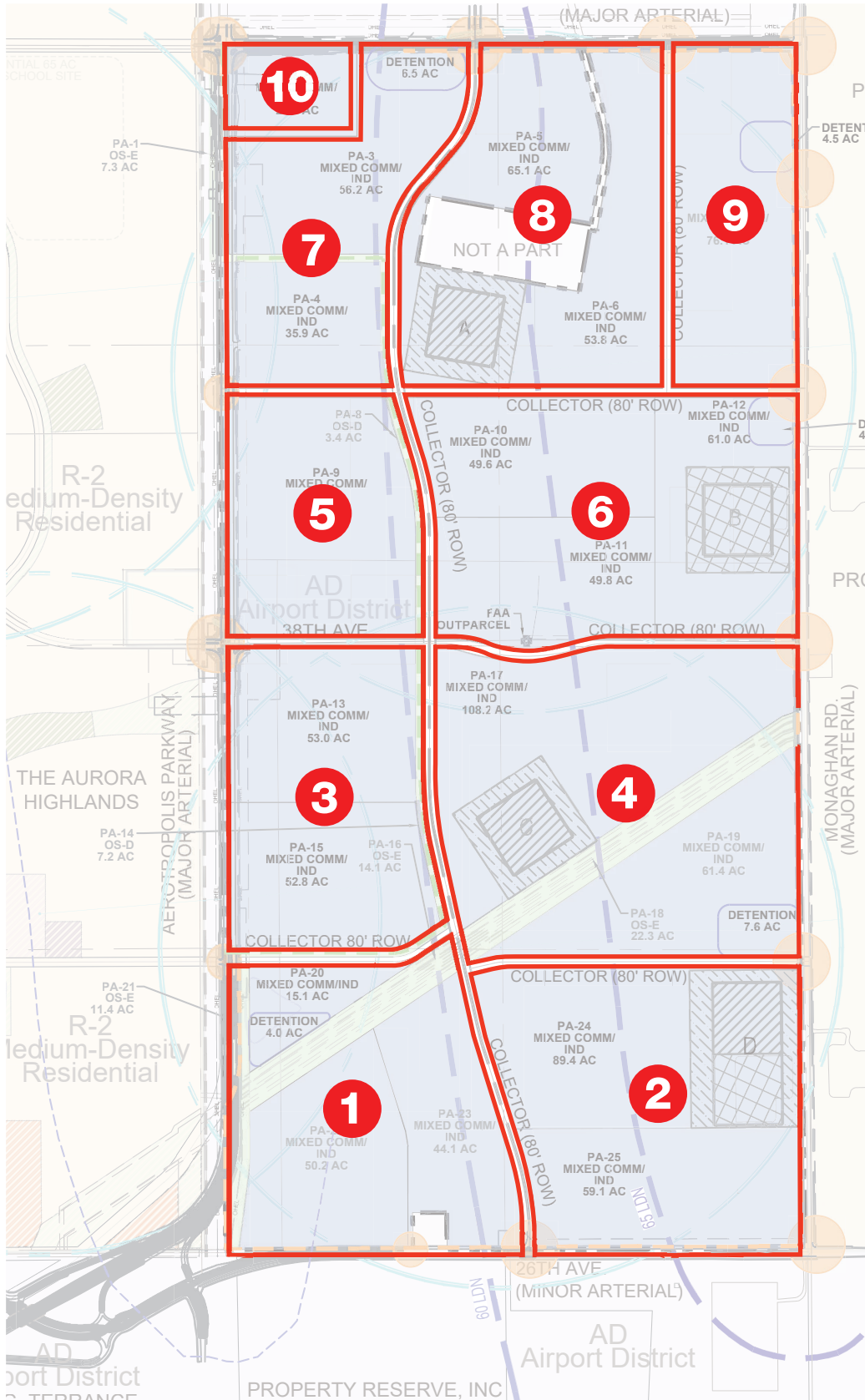
The number of vehicle-trips that will be generated by the proposed development was estimated based on trip rates and procedures documented in *Trip Generation* (Institute of Transportation Engineers, 11th Edition, 2021). The category used in this analysis includes industrial uses, ITE Code 130, Industrial Park, and ITE Code 820, Shopping Center. **Table 1** summarizes the trip generation estimates by planning area. In total, the entire ALC FDP is estimated to generate 39,300 external vehicle trips per day if built out to its absolute maximum. The planning areas shown in **Table 1** correspond to the Transportation Analysis Zones (TAZs) shown on **Figure 3**.

It should be noted that the rectangular white parcel shown on **Figure 3** in the northern portion of the FDP site is not included in this trip generation estimate since it is not part of the FDP and not planned for development at this time.

Table 1. Trip Generation Summary¹

Fig. 3 TAZ Zone #	Acres	Land Use	Developed SF Area (KSF)	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
1	109.4	Commercial/ Industrial Park	1668	4056	459	108	567	125	442	567
2	148.5	Commercial/ Industrial Park	2264	4755	624	146	770	169	601	770
3	105.8	Commercial/ Industrial Park	1613	3986	444	104	548	121	427	548
4	169.6	Commercial/ Industrial Park	2586	5095	712	167	879	193	686	879
5	80.4	Commercial/ Industrial Park	1226	3456	338	79	417	92	325	417
6	160.4	Commercial/ Industrial Park	2445	4949	673	158	831	183	648	831
7	92.1	Commercial/ Industrial Park	1404	3709	386	91	477	105	372	477
8	118.9	Commercial/ Industrial Park	1813	4236	499	117	616	136	480	616
9	76.1	Commercial/ Industrial Park	1160	3359	319	75	394	87	307	394
10	20.6	Commercial/ Industrial Park	314	1702	87	20	107	24	83	107
			16493	39303	4541	1065	5606	1235	4371	5606

¹Square footage amounts based on applying a Floor-Area Ratio (FAR) of 0.35.



IV.B. Trip Distribution and Traffic Assignment

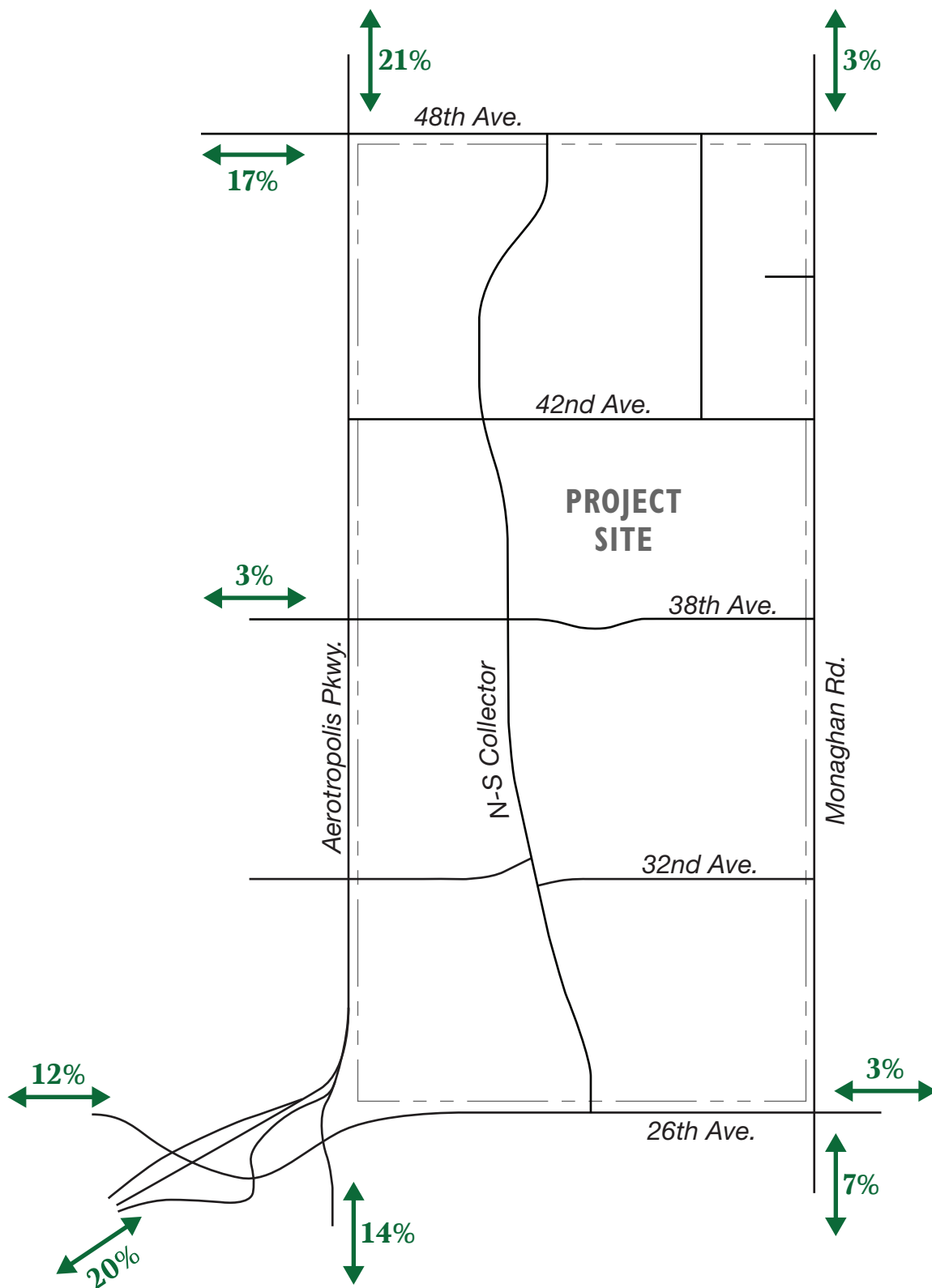
The site trip distribution assumptions for the ALC development have been estimated from the NEATS model TAZ centroid traffic loadings and professional judgment of the directionality of these trips apparent in the Buildout NEATS assignment results. The distribution percentages are based on patterns observed from NEATS travel demand modeling. That is, FHU staff reviewed the raw results of the model to help develop the percentages. Results were modified based on feedback from City staff on the first submittal of this report in September 2020.

Figure 4 shows the trip distribution percentages used in the study. The NEATS model indicates that the trip distribution for the site will be primarily focused to the south, west, and north. Numerous roads will serve the site traffic in these overall cardinal directions. However, westerly oriented traffic is anticipated to primarily make use of 48th Avenue, and to a lesser degree, 26th Avenue. The model does not suggest that 38th Avenue would necessarily play a significant role in serving westerly oriented site traffic. This is primarily due to the planned residential area to the west (The Aurora Highlands), which will not provide a direct east-west arterial connectivity through that area.

The direct diagonal connection heading away from the site toward the southwest via a new major road will directly connect to a future interchange to I-70, and this directional orientation will be a significant attraction of site traffic. The NEATS travel demand model suggests a significant amount of the site's traffic will use this direct regional access, and 20 percent of the site traffic is anticipated to do so. There will also be an attraction to DEN and other planned development, all of which would be served by Powhatan Road to Jackson Gap Way to the north, and to a lesser extent Monaghan Road to the north.

Applying the trip distribution percentages of **Figure 4** to the trip generation estimate of **Table I** yields the site-generated traffic shown on **Figure 5**. These estimates have been developed assuming that the zones (shown on **Figure 3**) will have access to each adjacent roadway, with the exception of Aerotropolis Parkway, in which no direct access will be allowed other than the intersections with 32nd Avenue, 38th Avenue, and 42nd Avenue. Resulting projections will be greater than those in NEATS since this study considers the maximum buildout potential of ALC, whereas the *NEATS Refresh* considered a less-intense development level. Within ALC, very little development was assumed to occur in the ALC property with respect to the NEATS travel demand model.

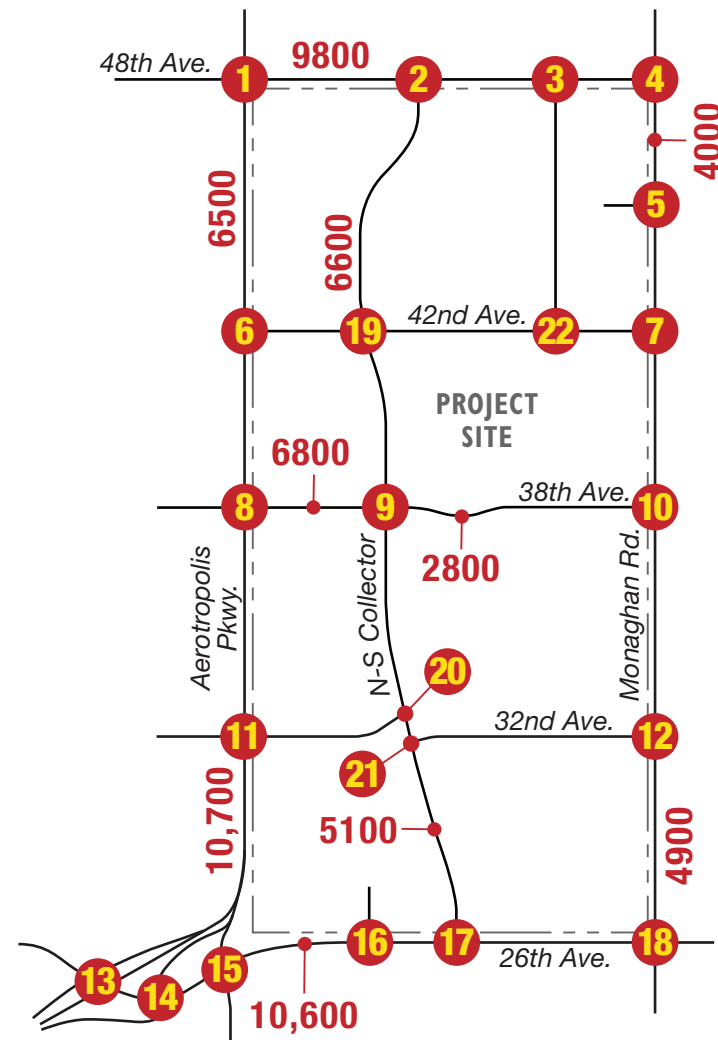
The roadway that will be impacted the most by site traffic is 26th Avenue, which is projected to serve 10,600 vehicles per day (VPD) of ALC traffic adjacent to the site. The internal collector roads are anticipated to serve less than 7,000 VPD of site traffic.



LEGEND

XX% = Site Trip Distribution

KEY MAP

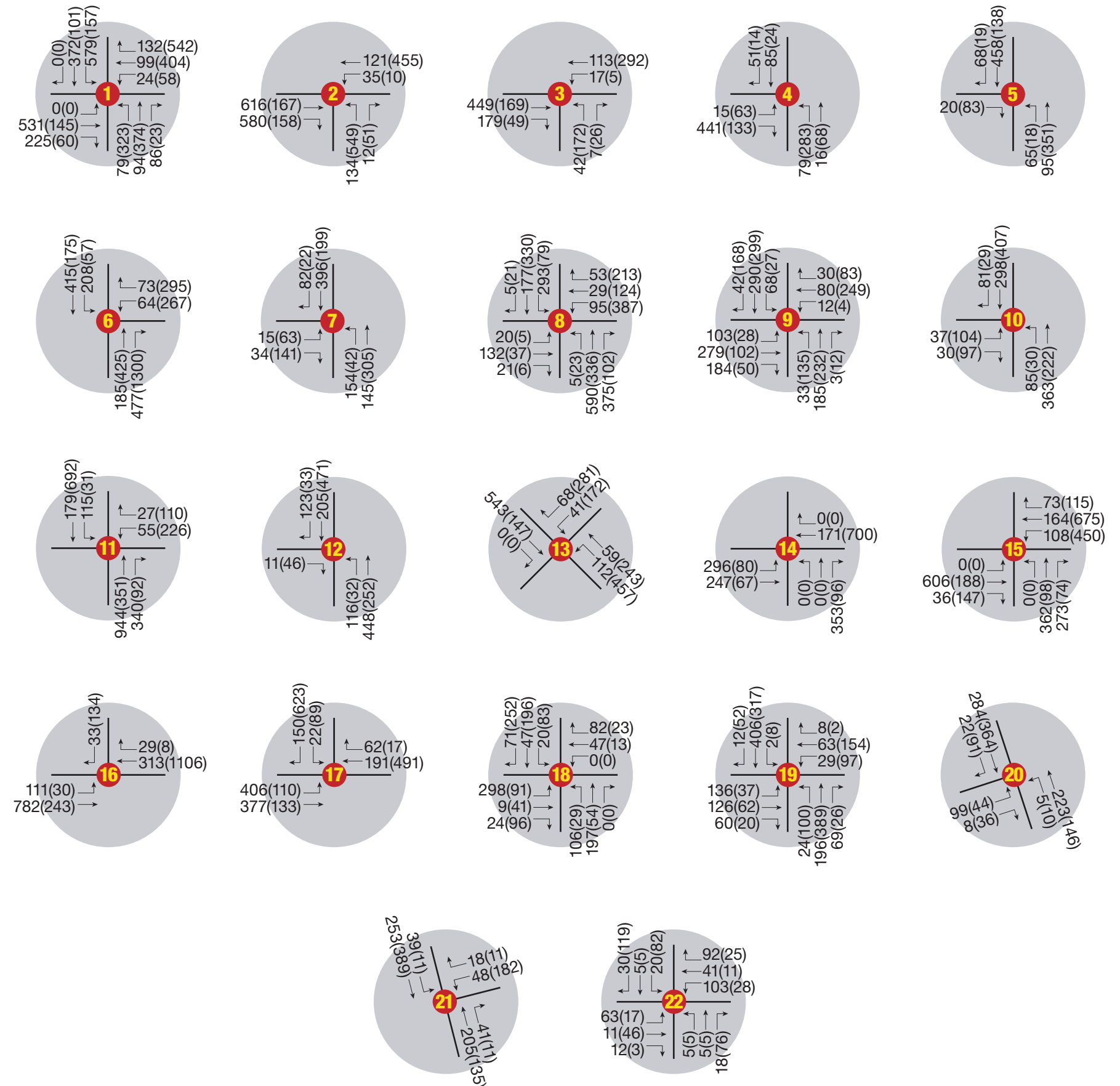


LEGEND

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

XXXX = Daily Traffic Volumes

NOTE: Drawing Not to Scale



IV.C. Background Traffic Volumes

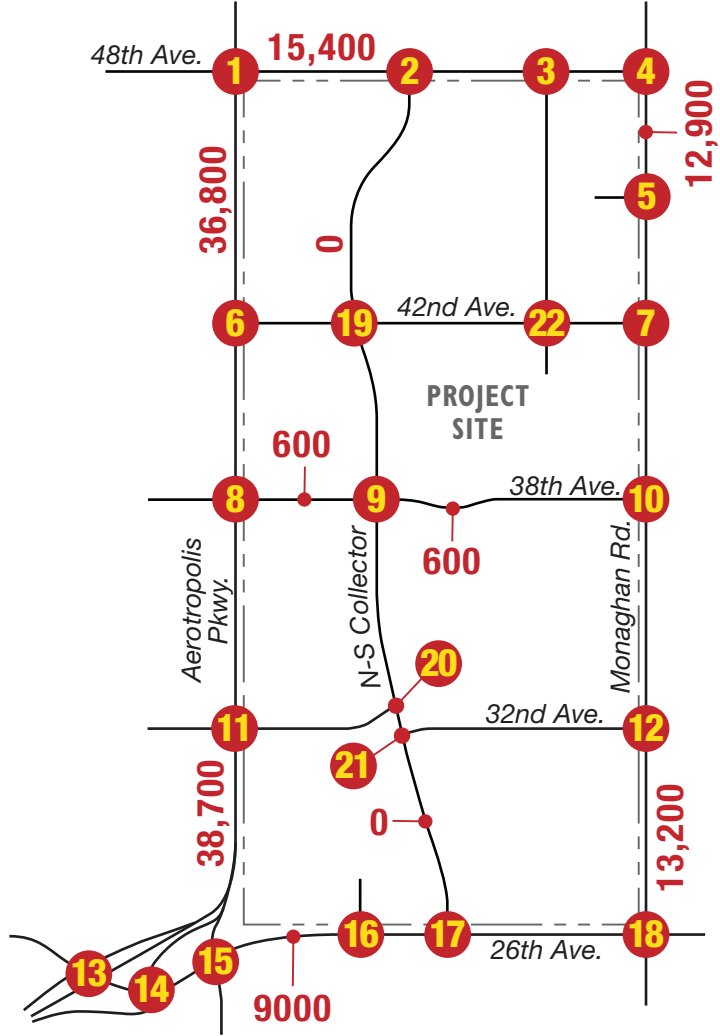
The previously mentioned AECOM Traffic Forecasting memo was used as the primary means of developing background traffic for this ALC FDP traffic study. This memo provides daily traffic projections along all ALC perimeter roadways, which included trips generated by ACL property. Estimated trips from the ALC FDP area programmed into the AECOM memo were removed in developing 2045 background traffic for this study. As mentioned, the AECOM traffic projections align with the NEATS Buildout (as opposed to NEATS 2040), as well as the subsequent Powhatan Road Alignment Study Buildout traffic projections. The traffic numbers are a fallout of the NEATS Buildout generation, so using them as a basis for year 2045 background is conservative.

Resulting daily traffic was then converted to AM and PM peak hour traffic by applying an approximate 9 percent and 10 percent, respectively, peak hour percentage. Directional split of the peak hour traffic was estimated from the AM and PM peak period assignment results per the NEATS travel demand modeling.

The peak hour intersection turning movement projections were then developed by applying techniques developed by the National Cooperative Highway Research Program. Adjustments were made to produce reasonable AM and PM peak hour directional reflection patterns and to reasonably balance traffic flows between successive intersections.

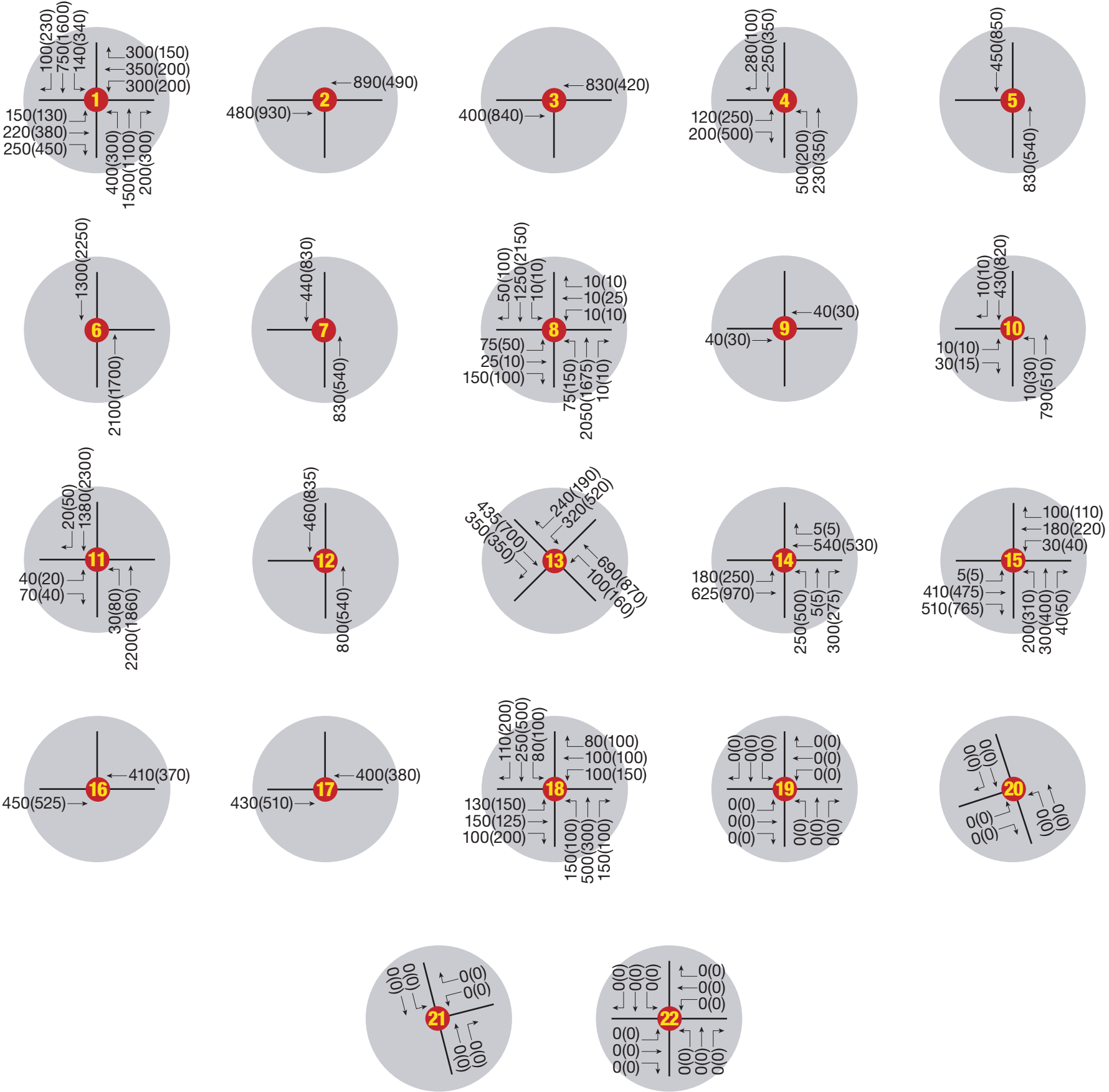
Figure 6 shows background traffic volume estimates. Aerotropolis Parkway will be the busiest roadway in the study area serving an estimated background traffic demand of approximately 39,000 VPD north of 26th Avenue, the highest volume roadway along the ALC perimeter with respect to background traffic.

KEY MAP



LEGEND

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



V. YEAR 2045 TOTAL TRAFFIC CONDITIONS

The daily and peak hour traffic volume estimates for the ALC site shown on **Figure 5** were combined with the Year 2045 background traffic volume projections of **Figure 6** to create the Year 2045 total traffic forecasts along the study area roads and intersections. These estimated forecasts are shown on **Figure 7**.

Aerotropolis Parkway is projected to carry the greatest traffic in the immediate study area. A strong background pattern is projected involving vehicles traveling the diagonal segment of Aerotropolis Parkway to/from south of 26th Avenue to/from the north via Jackson Gap Way into and out of DEN. This roadway will ultimately provide a new interchange with I-70. Other notable volume forecasts include 48th Avenue, which could serve 25,200 VDP adjacent to the site. Monaghan Road and 26th Avenue are both projected to serve 17,000 to 20,000 VPD.

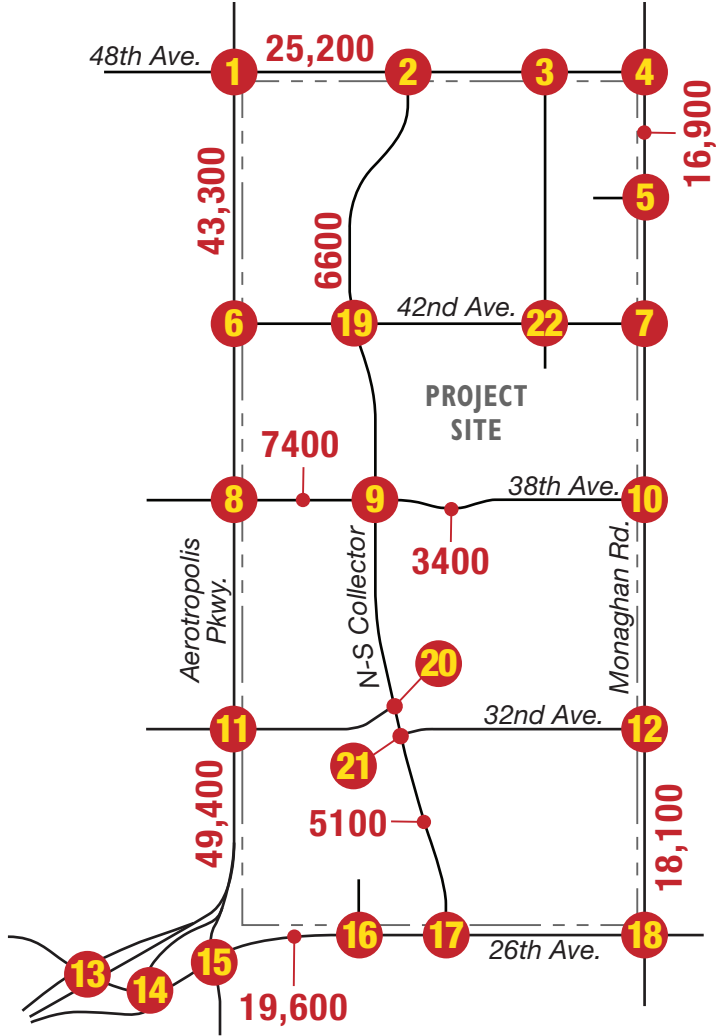
V.A. Traffic Signalization Warrant Analyses

The *Manual on Uniform Traffic Control Devices* (MUTCD) identifies eight warrants that provide guidance to determine whether installation of a traffic signal is justified. Some of these warrants are based on traffic volume levels, while others are based on the accident history of an intersection or whether the intersection is a designated school crossing. The four-hour warrant has been applied to assess the need. Forecasts for the four highest hours of a typical weekday were developed by applying factors to the AM and PM peak hours. Other than the planned interchange at Powhatan Road/Aerotropolis Parkway/26th Avenue (which will clearly involve signalization), other intersections were evaluated as shown in **Appendix A**. The following were found to meet warrants based on the 2045 traffic projections:

- Aerotropolis Parkway/38th Avenue
- Aerotropolis Parkway/32nd Avenue
- Aerotropolis Parkway/48th Avenue
- Aerotropolis Parkway/38th Avenue
- Aerotropolis Parkway/42nd Avenue
- Monaghan Road/26th Avenue
- Monaghan Road/38th Avenue
- Monaghan Road /42nd Avenue
- Monaghan Road/48th Avenue
- 26th Avenue/ North-south internal collector road
- 26th Avenue/Powhatan Road
- 26th Avenue/Diverging Diamond intersections
- 48th Avenue/North-south internal collector roads (both intersections)

Other intersections onto the adjacent arterials are recommended for restricted movements, which is discussed later in this report.

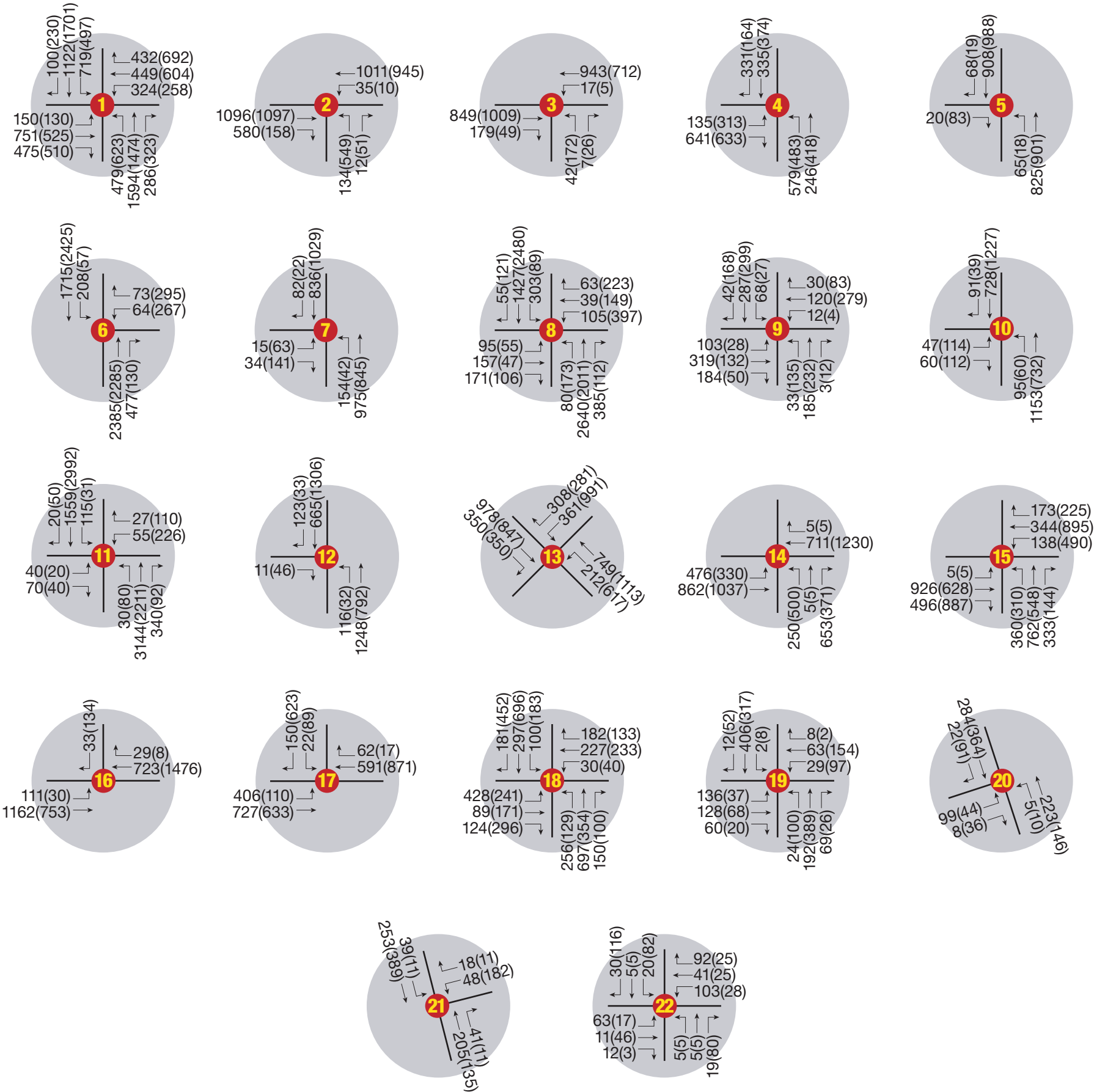
KEY MAP



LEGEND

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

NOTE: Drawing Not to Scale

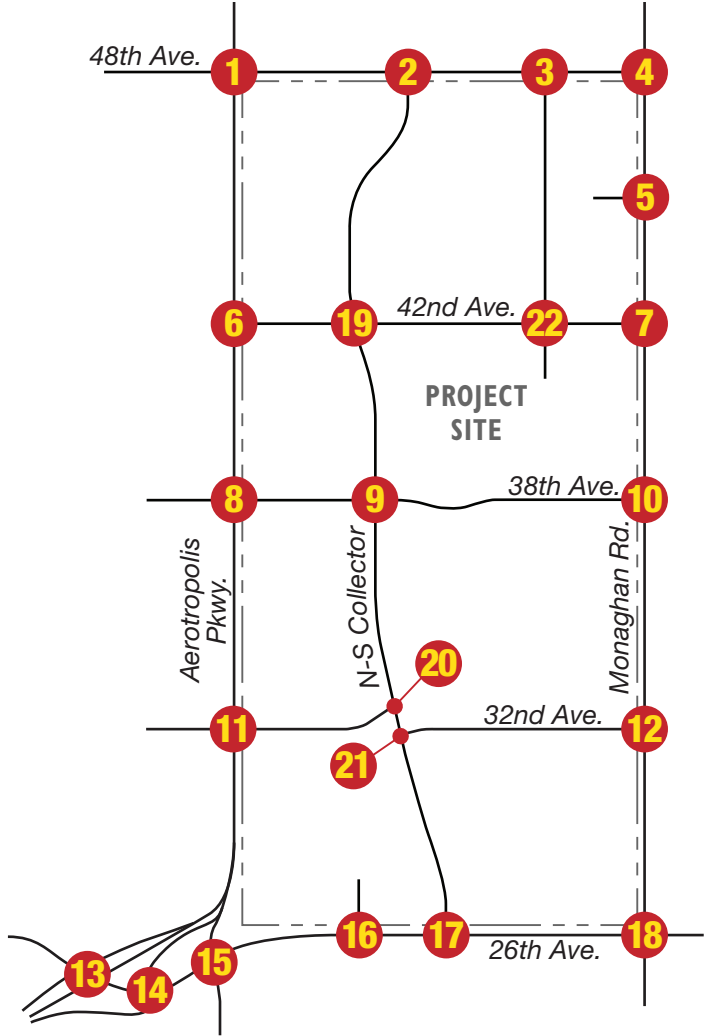


V.B. Roadway and Intersection Capacity Analyses



Capacity analyses were conducted for the surrounding roadway network using the traffic volume estimates of **Figure 7**. The level of service (LOS) analysis results and intersection lane requirements can be found on **Figure 8** (worksheets are included in **Appendix B**). With respect to the roadways, **Figure 9** shows the roadway needs in map form with the following cross-sections descriptions:

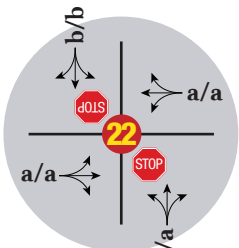
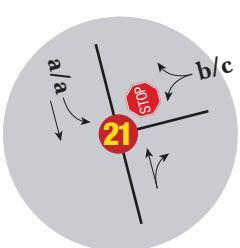
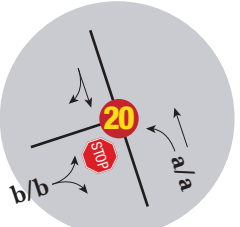
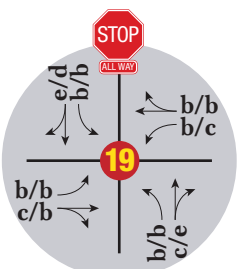
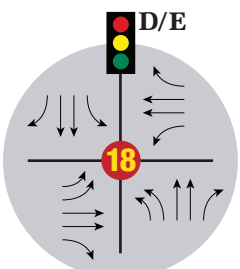
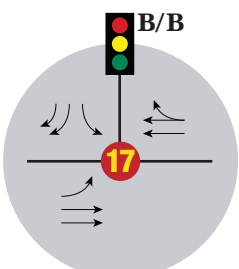
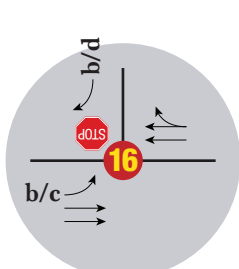
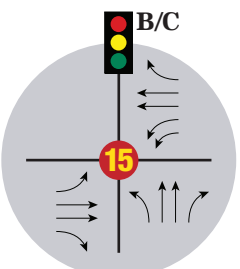
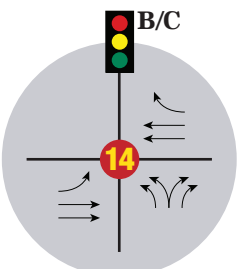
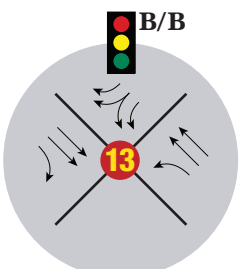
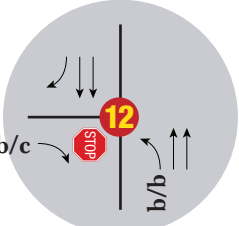
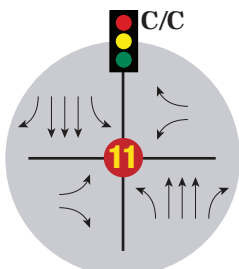
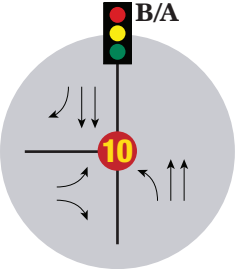
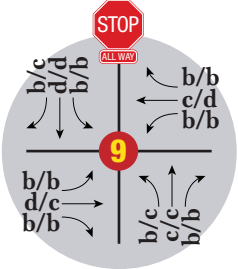
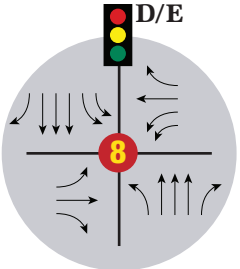
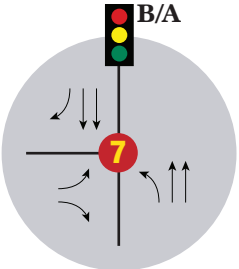
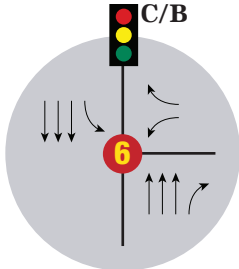
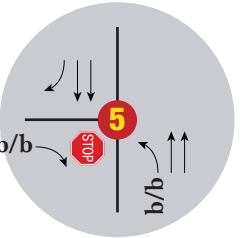
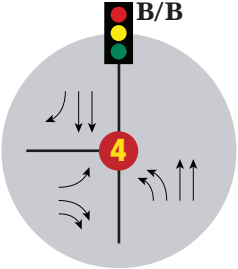
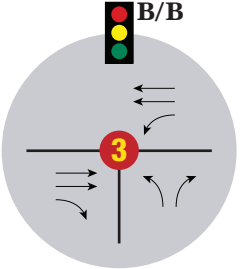
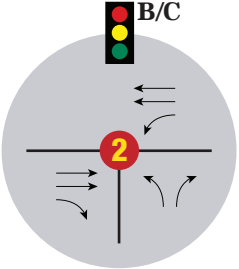
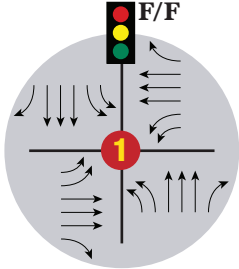
- **Aerotropolis Parkway (diagonally to the southwest)** should ultimately be built to a major arterial classification to include six through lanes of traffic. Turn lanes are needed at the major intersections as described in the following section.
- **Aerotropolis Parkway**, from 26th Avenue to 48th Avenue, should ultimately be built to a major arterial classification to include six through lanes of traffic. North of 48th Avenue, the cross section would continue as a six-lane arterial, connecting with Jackson Gap Way near 56th Avenue (on further into DEN). South of 26th Avenue, the cross-section would narrow to a four-lane section. Turn lanes are needed at the intersections as described in the following section.
- **Monaghan Road**, from 26th Avenue to 48th Avenue, should be built to a four-lane minor arterial cross-section with widened sections for turn lanes at major intersections as described in the following section.
- **26th Avenue** should be built to a four-lane minor arterial standard. Left turn lanes will be needed at all cross-streets, and right turn lanes will be needed at the heavier-used cross-streets.
- **38th Avenue** should be built to a three-lane collector standard through the site, which includes a center left turn lane and one through lane in each direction. Additional turn lanes will be needed at the Aerotropolis Parkway intersection.
- **48th Avenue** will be a four-lane arterial adjacent to the ALC site, widening to a six-lane arterial west of Aerotropolis Parkway. Turn lanes will be required at all intersections.
- The **North-South collector road** through the site should be built to a three-lane collector standard through the site, which includes a center left turn lane and one through lane in each direction. Additional turn lanes will be needed at the 26th Avenue, 38th Avenue, and 48th Avenue intersections.
- The **North-South collector road** in the northeastern area of the master plan (which connects 48th and 42nd Avenues) should be built to a two-lane collector standard for its length.
- **32nd and 42nd Avenues** should be built to include two through lanes, with a two-lane collector roadway classification being most appropriate.

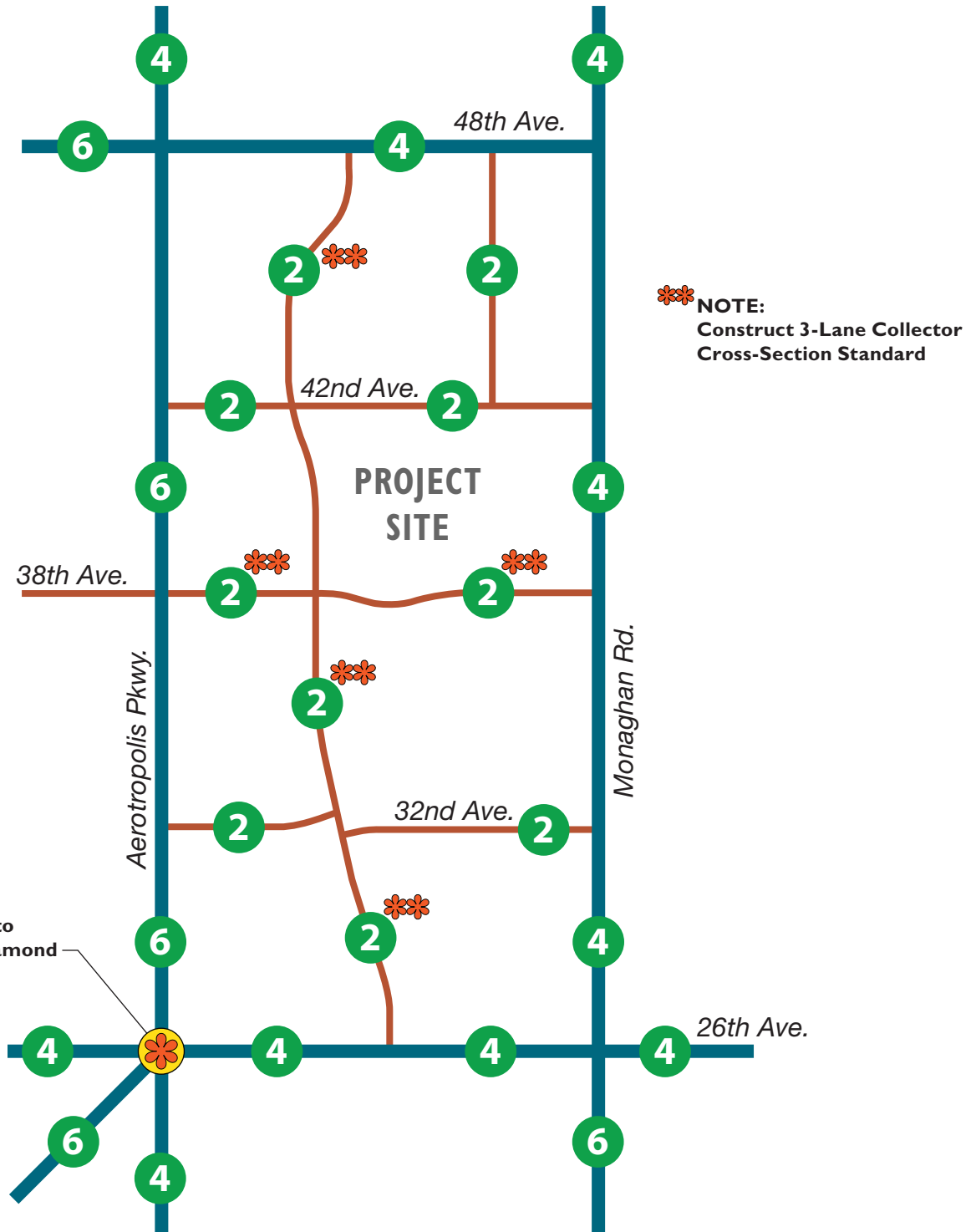
KEY MAP



LEGEND

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





LEGEND

- = Arterial
- = Collector
- X = Number of Through Lanes

With respect to the intersections, the following illustrate the turn lane geometry needs at specific intersections analyzed in this study:

- **Aerotropolis/48th.** Lane needs include three through lanes and dual left turn lanes along all four approaches. Each approach should also provide separate right turn lanes. Even with this “maxed-out” intersection geometry, this intersection could still experience operational challenges during peak hours given the high level of background traffic projected along Aerotropolis Parkway. A 150-second cycle length may be needed for this intersection to function properly (which was applied to this analysis).
- **48th/North-South Collector Road.** As a tee intersection, this intersection should function no worse than LOS C. While not needed from a LOS perspective, dual left turn lanes should be considered along the northbound approach. Dual left turns were not specifically analyzed in this report, but a more detailed future traffic impact study should consider this possibility, especially if any future development on the north side of 48th Avenue accesses this location.
- **48th/Monaghan.** With 48th Avenue terminating at Monaghan, this will be a tee-intersection. Background traffic will be the primary culprit to warranting signalization. Dual left turn lanes should be provided along the northbound approach.
- **26th/Monaghan.** Each approach should ultimately provide dual through lanes, a separate right turn lane, and a separate left turn lane. The northbound and eastbound approaches should also include a second left turn lane.
- **Aerotropolis/38th.** Lane needs include dual left turn lanes along the southbound and westbound approaches. Separate right turn lanes should also be provided along all four approaches. One east-west through lane should be provided in each direction.
- **Aerotropolis /42nd Avenue.** Signalization will be warranted based on the 2045 traffic. The westbound approach should have dedicated left and right turn lanes. Northbound and south approaches should have separated right and left turn lanes, respectively.
- **Aerotropolis /32nd Avenue.** Signalization will be warranted based on the 2045 traffic. Separate left and right turn lanes should also be provided along all four approaches. Eastbound and westbound through movements would be restricted.
- **38th/North-South Collector Road.** This internal intersection will not warrant signalization. Acceptable operations can be achieved with an all-way-stop intersection. A separate lane should be provided for each movement along all four approaches.
- **38th/Monaghan.** With 38th Avenue terminating at Monaghan, this will be a tee-intersection that is anticipated to warrant signalization. Single turn lanes for all turning movements should be provided as should dual through lanes north-south.
- **26th/North-South Collector.** Signalization will be warranted based on the 2045 traffic, and this intersection will experience a heavy pattern of traffic between the north and west legs of this intersection. Given the heavy southbound right turn movement, dual right turn lanes should be provided for this movement. An option could be to provide a free-flow southbound right turn lane provided that a westbound acceleration lane is added to 26th Avenue to receive free-flowing traffic.
- **32nd/ Monaghan.** This intersection is recommended to be three-quarter movement in which the eastbound left-out movement would be prohibited. A planned signal at 38th Avenue can instead serve this left turn demand.

- **26th/Monaghan.** This intersection will need dual left turn lanes along the northbound and eastbound approaches. All four approaches should also be built with a separate right turn lane and dual through lanes. Signalization should be planned.
- **Powhaton/Aerotropolis/26th.** This is a planned diverging diamond interchange. The analyses presented in this report indicate that this configuration will function well.

Several perimeter intersections have been identified to be limited turns to avoid installing too many signals and also realizing that another nearby signal would be accessible. These intersections include:

- Monaghan/42nd Avenue
- Monaghan/32nd Avenue
- 26th/Access (first one east of Powhaton). Development served by this access should ideally be able to access the north-south collector road. That is, Planning Area 22 on the master plan should be provided access to the north-south collector road through Planning Area 23.

In addition to the turn lane needs described previously, a queuing analysis at the study area intersections was also completed, the results of which are shown in **Table 2**

The City of Aurora's *Traffic Impact Study Guidelines* indicate that the CDOT State Highway Access Code (SHAC) should be used to determine storage and taper lengths. These values often yield overly conservative results and provide storage well in excess of 95th percentile queues (which already incorporate a heavy vehicle percentage of 10 percent), often by a factor of two to three. The SHAC procedures do not account for other conditions in the intersection such as low opposing through movements if a left turn movement is in question. As such, there are instances above where the final recommendation would more appropriately align with the 95th percentile lengths relative to informing design.

Lead-in taper lengths should be informed by speeds per the CDOT SHAC as follows:

- 50 miles per hour (MPH) – 15:1 taper (180 feet for one lane, 360 feet for dual lanes)
- 45 MPH – 13.5:1 taper (162 feet for one lane, 324 feet for dual lanes)
- 40 MPH – 12:1 taper (144 feet for one lane, 288 feet for dual lanes)
- 35 MPH – 10:1 taper (120 feet for one lane, 240 feet for dual lanes)
- 30 MPH – 8:1 taper (96 feet for one lane, 192 feet for dual lanes)

Table 2 indicates which movements are more appropriately sized from the 95th percentile result. The second to last column reflects the recommended lane length based on the results and engineering judgment.

Table 2. Year 2045 Intersection Queuing Results*

Location	Critical Movements*	95% Queue Length (ft)	Recommended Storage Length***	SHAC** Recommended Auxiliary Lane Length
		2045 Build (AM/PM Peak)		
48 th Avenue & Aerotropolis Parkway (Intersection 1)	EB Left-turn	131 / 127	150	150
	EB Through	388 / 195	Continuous	Continuous
	EB Right-turn	Free Movement	Continuous	Continuous
	WB Left-turn	295 / 157	300	350
	WB Through	189 / 203	Continuous	Continuous
	WB Right-turn	154 / 690	700	700
	NB Left-turn	289 / 415	425	625
	NB Through	709 / 545	Continuous	Continuous
	NB Right-turn	Free Movement	Continuous	Continuous
	SB Left-turn	484 / 306	500	725
	SB Through	396 / 701	Continuous	Continuous
	SB Right-turn	16 / 111	125	250
48 th Avenue & N-S Collector (Intersection 2)	EB Through	201 / 252	Continuous	Continuous
	EB Right-turn	40 / 26	50	600
	WB Left-turn	25 / 5	25	50
	WB Through	178 / 191	200	Continuous
	NB Left-turn	80 / 303	325	575
	NB Right-turn	10 / 21	25	75
48 th Avenue & N Access (Intersection 3)	EB Through	147 / 207	Continuous	Continuous
	EB Right-turn	27 / 6	50	200
	WB Left-turn	13 / 5	25	25
	WB Through	170 / 118	Continuous	Continuous
	NB Left-turn	21 / 65	75	200
	NB Right-turn	6 / 11	25	50
48 th Avenue & Monaghan Road (Intersection 4)	EB Left-turn	80 / 253	450	325
	EB Right-turn	55 / 67	75	650
	NB Left-turn	88 / 185	175	600
	NB Through	37 / 73	Continuous	Continuous
	SB Through	86 / 108	Continuous	Continuous
	SB Right-turn	62 / 33	75	350
E Access & Monaghan Road (Intersection 5)	EB Right-turn	3 / 19	25	100
	NB Left-turn	18 / 3	25	75
	NB Through	N/A	Continuous	Continuous
	SB Through	N/A	Continuous	Continuous
	SB Right-turn	N/A	75	75

Location	Critical Movements*	95% Queue Length (ft)	Recommended Storage Length***	SHAC** Recommended Auxiliary Lane Length
		2045 Build (AM/PM Peak)		
42 nd Avenue & Aerotropolis Parkway (Intersection 6)	WB Left-turn	49 / 243	Continuous	Continuous
	WB Right-turn	N/A	Continuous	Continuous
	NB Through	375 / 350	Continuous	Continuous
	NB Right-turn	35 / 18	50	500
	SB Left-turn	232 / 96	250	225
	SB Through	203 / 392	Continuous	Continuous
42 nd Avenue & Monaghan Road (Intersection 7)	EB Left-turn	39 / 91	100	75
	EB Right-turn	25 / 59	75	175
	NB Left-turn	38 / 29	50	175
	NB Through	125 / 183	Continuous	Continuous
	SB Through	305 / 164	Continuous	Continuous
	SB Right-turn	16 / 0	25	100
38 th Avenue & Aerotropolis Parkway (Intersection 8)	EB Left-turn	234 / 109	250	100
	EB Through	281 / 92	Continuous	Continuous
	EB Right-turn	75 / 39	75	175
	WB Left-turn	86 / 269	300	425
	WB Through	79 / 225	Continuous	Continuous
	WB Right-turn	17 / 186	200	225
	NB Left-turn	96 / 358	375	175
	NB Through	1162 / 682	Continuous	Continuous
	NB Right-turn	264 / 10	275	400
	SB Left-turn	247 / 80	250	325
	SB Through	369 / 1177	Continuous	Continuous
	SB Right-turn	0 / 33	50	125
38 th Avenue & N-S Collector (Intersection 9)	EB Left-turn	25 / 8	25	125
	EB Through	158 / 43	Continuous	Continuous
	EB Right-turn	48 / 13	50	200
	WB Left-turn	3 / 0	25	25
	WB Through	35 / 153	Continuous	Continuous
	WB Right-turn	5 / 20	25	100
	NB Left-turn	8 / 43	50	150
	NB Through	65 / 100	Continuous	Continuous
	NB Right-turn	0 / 3	25	25
	SB Left-turn	15 / 5	25	75
	SB Through	135 / 163	Continuous	Continuous
	SB Right-turn	8 / 48	50	200

Location	Critical Movements*	95% Queue Length (ft)	Recommended Storage Length***	SHAC** Recommended Auxiliary Lane Length
		2045 Build (AM/PM Peak)		
38 th Avenue & Monaghan Road (Intersection 10)	EB Left-turn	31 / 70	75	125
	EB Right-turn	21 / 57	75	125
	NB Left-turn	53 / 72	75	125
	NB Through	217 / 114	Continuous	Continuous
	SB Through	115 / 306	Continuous	Continuous
	SB Right-turn	17 / 19	25	100
32 nd Avenue & Aerotropolis Parkway (Intersection 11)	EB Left-turn	79 / 40	100	50
	EB Right-turn	57 / 28	75	75
	WB Left-turn	103 / 321	325	250
	WB Right-turn	49 / 97	100	125
	NB Left-turn	15 / 16	25	50
	NB Through	642 / 519	Continuous	Continuous
	NB Right-turn	33 / 30	25	325
	SB Left-Turn	350 / 16	350	125
	SB Through	99 / 1113	Continuous	Continuous
	SB Right-Turn	2 / 15	25	50
32 nd Avenue & Monaghan Road (Intersection 12)	EB Right-turn	3 / 13	25	50
	NB Left-turn	15 / 8	25	125
	NB Through	N/A	Continuous	Continuous
	SB Through	N/A	Continuous	Continuous
	SB Right-turn	N/A	25	125
26 th Avenue & Powhatan Road (Intersection 15)	EB Left-turn	5 / 5	25	25
	EB Through	166 / 155	Continuous	Continuous
	EB Right-turn	45 / 513	275	975
	WB Left-turn	36 / 93	100	550
	WB Through	55 / 162	Continuous	Continuous
	WB Right-turn	50 / 20	75	250
	NB Left-turn	140 / 178	200	400
	NB Through	128 / 136	Continuous	Continuous
	NB Right-turn	124 / 34	125	375
26 th Avenue & S Access (Intersection 16)	EB Left-turn	15 / 8	25	125
	EB Through	N/A	Continuous	Continuous
	WB Through	N/A	Continuous	Continuous
	WB Right-turn	N/A	25	50
	SB Right-turn	5 / 60	75	125
26 th Avenue & N-S Collector (Intersection 17)	EB Left-turn	271 / 68	275	450
	EB Through	110 / 118	Continuous	Continuous
	WB Through	200 / 218	Continuous	Continuous
	SB Left-turn	25 / 57	75	125
	SB Right-turn	18 / 128	150	125

Location	Critical Movements*	95% Queue Length (ft)	Recommended Storage Length***	SHAC** Recommended Auxiliary Lane Length
		2045 Build (AM/PM Peak)		
26 th Avenue & Monaghan Road (Intersection 18)	EB Left-turn	229 / 116	250	475
	EB Through	55 / 55	Continuous	Continuous
	EB Right-turn	30 / 51	75	325
	WB Left-turn	56 / 44	75	50
	WB Through	131 / 72	Continuous	Continuous
	WB Right-turn	57 / 0	75	200
	NB Left-turn	134 / 69	150	275
	NB Through	310 / 104	Continuous	Continuous
	NB Right-turn	44 / 0	50	175
	SB Left-turn	81 / 177	200	200
	SB Through	166 / 247	Continuous	Continuous
	SB Right-turn	55 / 69	75	500
42 nd Avenue & N-S Collector (Intersection 19)	EB Left-turn	35 / 8	50	150
	EB Through-Right	50 / 20	Continuous	Continuous
	WB Left-turn	5 / 25	25	100
	WB Through-Right	15 / 43	Continuous	Continuous
	NB Left-turn	5 / 23	50	100
	NB Through-Right	88 / 245	Continuous	Continuous
	SB Left-turn	0 / 3	25	25
	SB Through-Right	238 / 190	Continuous	Continuous
West 32 nd Avenue & N-S Collector (Intersection 20)	EB Left-Right	23 / 15	Continuous	Continuous
	NB Left-turn	0 / 0	25	25
	NB Through	N/A	Continuous	Continuous
	SB Through	N/A	Continuous	Continuous
	SB Right-turn	N/A	25	25
East 32 nd Avenue & N-S Collector (Intersection 21)	WB Left-Right	13 / 56	Continuous	Continuous
	NB Through	N/A	Continuous	Continuous
	NB Right-turn	N/A	25	50
	SB Left-turn	3 / 0	25	50
	SB Through	N/A	Continuous	Continuous
42 nd Avenue & Northeast Access Road (Intersection 22)	EB Through-Left	6 / 0	Continuous	Continuous
	WB Through-Left	N/A	Continuous	Continuous
	NB Left-turn	3 / 8	25	25
	SB Left-turn	8 / 25	25	100

Notes:

*Where dual lanes are provided, the presented value is on a per lane basis.

The State Highway Access Code recommended auxiliary storage lengths in **Table 2 represent the storage length without the inclusion of taper length.

*** Recommended length based primarily on 95th percentile queue than SHAC.

VI. SUMMARY AND RECOMMENDATIONS

Stream Realty is planning to develop an approximate 1,280-acre site in Aurora, Colorado, referred to as Aurora Logistics Center (ALC). The FDP site is located along the east side of the future Aerotropolis Parkway between 26th Avenue and the future 48th Avenue. If built to its maximum allowed density, up to 16.4 million square feet of industrial and commercial building space could occur, estimated to generate up to 39,300 external vehicle-trips per day.

The recently updated *NEATS Refresh* identifies the appropriate roadway classification and laneage of the surrounding street system. The NEATS study and the AECOM traffic forecasting memo were key resources in preparing this traffic impact study with respect to the major roadways and the traffic demand for the rest of the area outside the ALC FDP.

The overarching roadway recommendations include:

- **Aerotropolis Parkway.** This roadway will ultimately serve as a busy north-south major arterial facility through the region. As such, ultimate traffic demands will be significant requiring a six-lane facility and dual left turn lanes along select approaches at all study area intersections. Signals will be warranted at 32nd, 38th, and 42nd Avenues. Because the initial construction of Aerotropolis Parkway will include a raised median at 32nd and 42nd, removal will be needed in the future when signalization is to be implemented. The 26th Avenue and Powhaton Road will be a diverging diamond interchange, which is projected to function well.
- **48th Avenue.** West of Aerotropolis Parkway, 48th Avenue is planned to provide six through lanes. East of Aerotropolis Parkway, 48th Avenue need only be a four-lane arterial with turn lanes at intersections. This roadway will not continue east beyond Monaghan Road.
- **38th Avenue.** This road will not extend east of Monaghan Road. Passing through the ALC Master Plan, this road should be planned as a three-lane collector road, with additional turn lanes needed at intersections, especially the Aerotropolis Parkway intersection.
- **Monaghan Road.** Projected traffic along this roadway suggests the need for a four-lane arterial road, which is consistent with NEATS. Center left turn lanes should be provided at all cross-streets; dual northbound left turn lanes should be provided at 48th Avenue.
- **26th Avenue.** The NEATS plan identifies this roadway to be a four-lane minor arterial that will suffice given the 2045 traffic projections. Turn lanes are needed at the intersections. Its intersection with Aerotropolis Parkway and Powhaton Road will include a diverging diamond interchange.
- **North-south Internal Road.** Passing through the FDP, this road should be planned as a three-lane collector road, with additional turn lanes needed at intersections.
- **32nd and 42nd Avenues** should be built to a two-lane collector roadway standard.

Relative to the study area intersections, traffic signals are anticipated to be installed at the major intersections, including:

- | | |
|--|--|
| ▪ Aerotropolis Parkway/48 th Avenue | ▪ Monaghan Road/48 th Avenue |
| ▪ Aerotropolis Parkway/42 nd Avenue | ▪ Monaghan Road/38 th Avenue |
| ▪ Aerotropolis Parkway/38 th Avenue | ▪ 26 th Avenue/North-South Collector Road |
| ▪ Aerotropolis Parkway/32 nd Avenue | ▪ 48 th Avenue/North-South Collector Road |
| ▪ Monaghan Road/26 th Avenue | ▪ 48 th Avenue NE collector Road |

As individual parcels develop, specific traffic analyses may be appropriate to refine the findings presented in this study. This analysis considers a potential maximum land use for each parcel, and the likely development will be less intense, thereby possibly leading to lesser improvement needs.

APPENDIX A. YEAR 2045 SIGNAL WARRANT ANALYSIS

MUTCD Volume-based Warrant Evaluation

48th & Powhatan

Intersection # 1

2040 Total Traffic



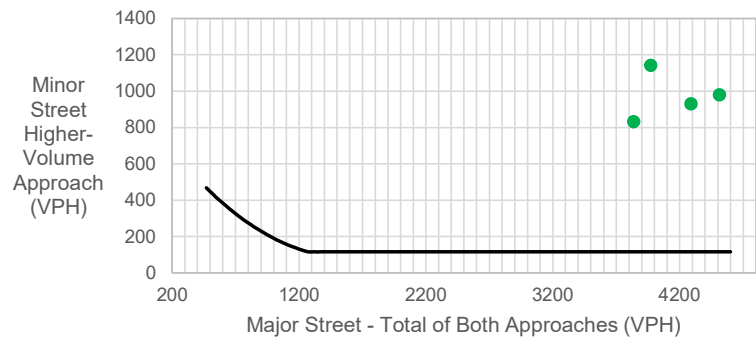
Major Street: 48th Ave
Approach Speed: 40 MPH
Lanes Moving Traffic: 2 or more
Option: Low Speed, Urban

Minor Street: Powhatan Rd
Right Turn Volume Included: 50% EB, 50% NB, 50% SB
Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
PM Peak Hour	4513	979
95% PM Peak Hour	4287	930
85% PM Peak Hour	3836	832
AM Peak Hour	3972	1142

Satisfied Yes
(100% Factor)



MUTCD Volume-based Warrant Evaluation
48th & N-S Collector
Intersection # 2
2040 Total Traffic



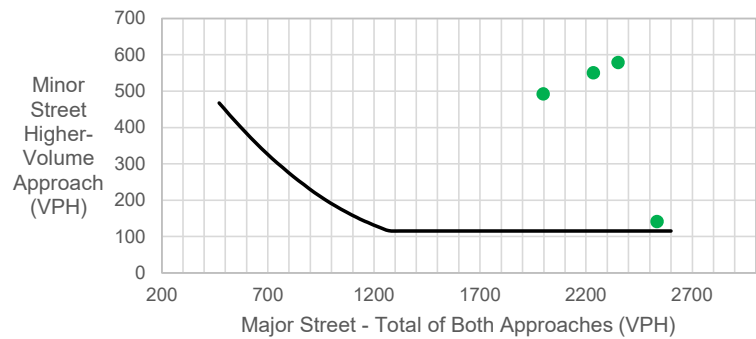
Major Street: 48th Ave
 Approach Speed: 40 MPH
 Lanes Moving Traffic: 2 or more
 Option: Low Speed, Urban

Minor Street: N-S Collector
 Right Turn Volume Included: 50% EB, 50% NB
 Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
PM Peak Hour	2351	579
95% PM Peak Hour	2233	550
85% PM Peak Hour	1998	492
AM Peak Hour	2533	141

Satisfied **Yes**
 (100% Factor)



MUTCD Volume-based Warrant Evaluation

48th & NE Access

Intersection # 3

2040 Total Traffic



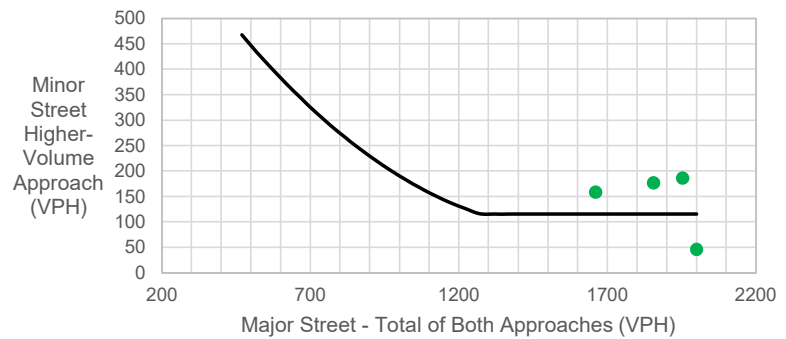
Major Street: 48th Ave
Approach Speed: 40 MPH
Lanes Moving Traffic: 2 or more
Option: Low Speed, Urban

Minor Street: North East Access
Right Turn Volume Included: 50% EB, 50% NB
Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
PM Peak Hour	1953	186
95% PM Peak Hour	1855	177
85% PM Peak Hour	1660	158
AM Peak Hour	2000	46

Satisfied No
(100% Factor)



MUTCD Volume-based Warrant Evaluation
Monaghan Rd & 48th Street
Intersection # 4
2040 Total Traffic



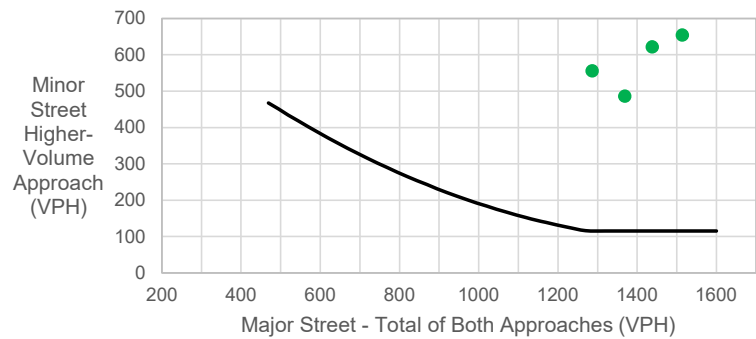
Major Street: Monaghan Rd
 Approach Speed: 40 MPH
 Lanes Moving Traffic: 2 or more
 Option: Low Speed, Urban

Minor Street: 48th Ave
 Right Turn Volume Included: 50% EB, 50% SB
 Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
PM Peak Hour	1514	654
95% PM Peak Hour	1438	621
85% PM Peak Hour	1287	556
AM Peak Hour	1369	486

Satisfied **Yes**
 (100% Factor)



MUTCD Volume-based Warrant Evaluation

42nd & Powhatan

Intersection # 6

2040 Total Traffic



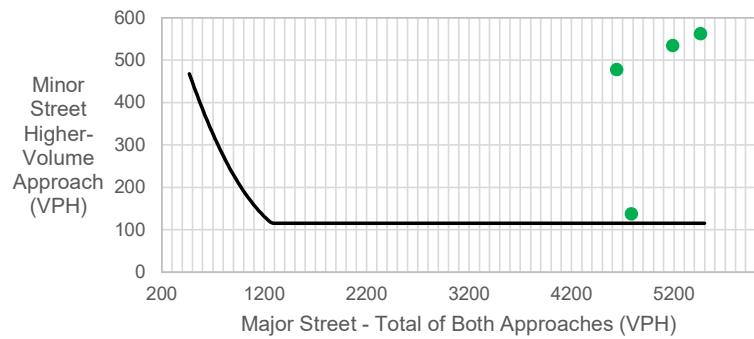
Major Street: Aerotropolis Parkway
Approach Speed: 40 MPH
Lanes Moving Traffic: 2 or more
Option: Low Speed, Urban

Minor Street: 42nd Ave
Right Turn Volume Included: 75% WB, 50% NB, 50% SB
Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Approchs. Major Street	Higher Vol. Approch. Minor Street
PM Peak Hour	5460	562
95% PM Peak Hour	5187	534
85% PM Peak Hour	4641	478
AM Peak Hour	4785	137

Satisfied **Yes**
(100% Factor)



MUTCD Volume-based Warrant Evaluation
Northern E-W Collector & Monaghan
Intersection # 7
2040 Total Traffic



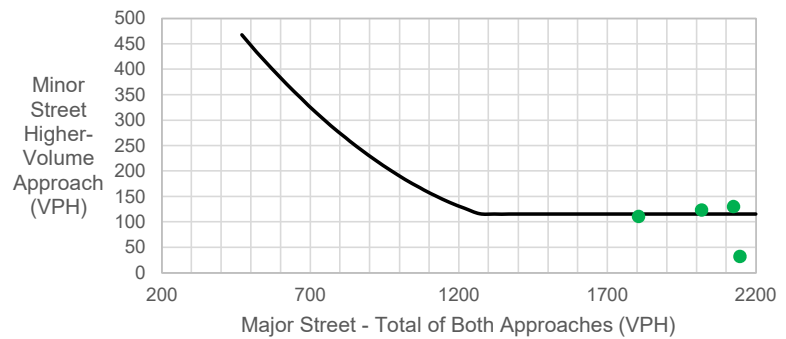
Major Street: Monaghan Rd
 Approach Speed: 40 MPH
 Lanes Moving Traffic: 2 or more
 Option: Low Speed, Urban

Minor Street: Northern E-W Collector
 Right Turn Volume Included: 50% EB, 50% NB, 50% SB
 Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Approchs. Major Street	Higher Vol. Approch. Minor Street
PM Peak Hour	2124	130
95% PM Peak Hour	2018	124
85% PM Peak Hour	1805	111
AM Peak Hour	2146	32

Satisfied No
 (100% Factor)



MUTCD Volume-based Warrant Evaluation

38th & Powhatan

Intersection # 8

2040 Total Traffic



Major Street: Powhatan Rd

Approach Speed: 40 MPH

Lanes Moving Traffic: 2 or more

Option: Low Speed, Urban

Minor Street: 38th Ave

Right Turn Volume Included: 50% EB, 50% NB, 50% SB

Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Aprchs. Major Street	Higher Vol. Aprch. Minor Street
PM Peak Hour	5394	174
95% PM Peak Hour	5124	165
85% PM Peak Hour	4585	148
AM Peak Hour	4533	304

Satisfied Yes
(100% Factor)



MUTCD Volume-based Warrant Evaluation
38th & Monaghan
Intersection # 10
2040 Total Traffic



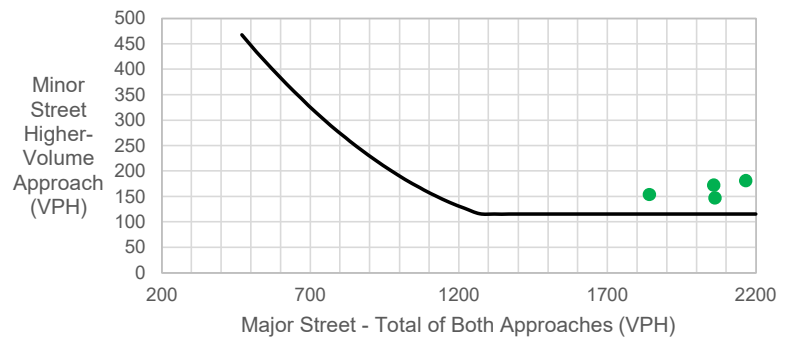
Major Street: Monaghan Rd
 Approach Speed: 40 MPH
 Lanes Moving Traffic: 2 or more
 Option: Low Speed, Urban

Minor Street: 38th Ave
 Right Turn Volume Included: 50% EB, 50% NB, 50% SB
 Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
PM Peak Hour	2166	181
95% PM Peak Hour	2058	172
85% PM Peak Hour	1841	154
AM Peak Hour	2062	147

Satisfied
 (100% Factor) **Yes**



MUTCD Volume-based Warrant Evaluation

32nd & Powhatan

Intersection # 11

2040 Total Traffic



Major Street: Aerotropolis Parkway
Approach Speed: 40 MPH
Lanes Moving Traffic: 2 or more
Option: Low Speed, Urban

Minor Street: 32nd Ave
Right Turn Volume Included: 75% WB, 50% NB, 50% SB
Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Approchs. Major Street	Higher Vol. Approch. Minor Street
PM Peak Hour	5460	336
95% PM Peak Hour	5187	319
85% PM Peak Hour	4641	286
AM Peak Hour	5210	110

Satisfied No
(100% Factor)



MUTCD Volume-based Warrant Evaluation

26th & Powhatan

Intersection # 15

2040 Total Traffic



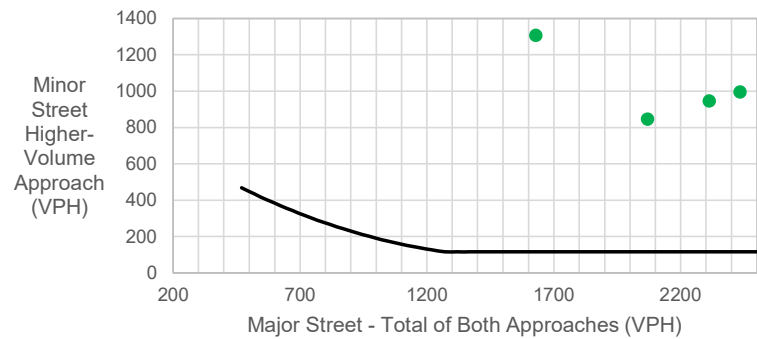
Major Street: 26th Ave
Approach Speed: 40 MPH
Lanes Moving Traffic: 2 or more
Option: Low Speed, Urban

Minor Street: Powhatan
Right Turn Volume Included: 50% EB, 50% WB, & 50% NB
Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Approchs. Major Street	Higher Vol. Approch. Minor Street
PM Peak Hour	2434	995
95% PM Peak Hour	2312	945
85% PM Peak Hour	2069	846
AM Peak Hour	1629	1307

Satisfied Yes
(100% Factor)



MUTCD Volume-based Warrant Evaluation
26th & N-S Collector
Intersection # 17
2040 Total Traffic



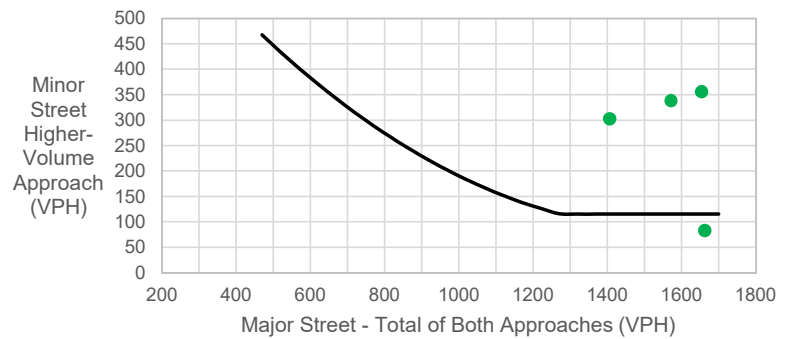
Major Street: 26th Ave
 Approach Speed: 40 MPH
 Lanes Moving Traffic: 2 or more
 Option: Low Speed, Urban

Minor Street: N-S Collector
 Right Turn Volume Included: 50% SB, 50% WB
 Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Approchs. Major Street	Higher Vol. Approch. Minor Street
PM Peak Hour	1654	356
95% PM Peak Hour	1571	338
85% PM Peak Hour	1406	303
AM Peak Hour	1662	83

Satisfied No
 (100% Factor)



MUTCD Volume-based Warrant Evaluation

26th & Monaghan

Intersection # 18

2040 Total Traffic



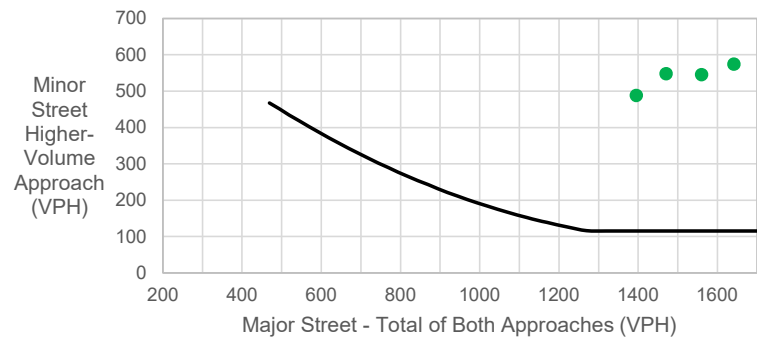
Major Street: 26th Ave
Approach Speed: 40 MPH
Lanes Moving Traffic: 2 or more
Option: Low Speed, Urban

Minor Street: Monaghan Rd
Right Turn Volume Included: 50% EB, 50% NB, 50% SB
Lanes Moving Traffic: 2 or more

WARRANT 2, Four Hour Vehicular Volume

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
PM Peak Hour	1642	574
95% PM Peak Hour	1560	545
85% PM Peak Hour	1396	488
AM Peak Hour	1471	548

Satisfied Yes
(100% Factor)















APPENDIX B. YEAR 2045 TOTAL TRAFFIC LEVEL OF SERVICE WORKSHEETS

Queues

2045 Total Conditions

1: Powhaton Rd & 48th Ave

AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	816	516	352	488	470	521	1733	311	782	1220	109
v/c Ratio	0.76	1.05	0.76	1.14	0.53	0.74	0.68	1.02	0.46	0.94	0.68	0.17
Control Delay	86.7	102.5	27.6	149.3	53.9	14.2	54.7	73.1	13.2	70.8	39.9	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	102.5	27.6	149.3	53.9	14.2	54.7	73.1	13.2	70.8	39.9	2.1
Queue Length 50th (ft)	76	~295	226	~192	148	27	225	~613	60	361	342	0
Queue Length 95th (ft)	#131	#388	335	#295	189	154	289	#709	148	#484	396	16
Internal Link Dist (ft)		930			718			3220			574	
Turn Bay Length (ft)	250		250	250		250	350		350	350		350
Base Capacity (vph)	214	776	675	309	917	639	762	1693	669	833	1799	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	1.05	0.76	1.14	0.53	0.74	0.68	1.02	0.46	0.94	0.68	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

























Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

1: Powhatan Rd & 48th Ave

2045 Total Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	751	475	324	449	432	479	1594	286	719	1122	100
Future Volume (veh/h)	150	751	475	324	449	432	479	1594	286	719	1122	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	163	816	516	352	488	470	521	1733	311	782	1220	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	214	772	588	309	948	294	760	1685	523	832	1825	567
Arrive On Green	0.06	0.15	0.15	0.09	0.19	0.19	0.23	0.34	0.34	0.25	0.37	0.37
Sat Flow, veh/h	3374	4985	1547	3374	4985	1547	3374	4985	1547	3374	4985	1547
Grp Volume(v), veh/h	163	816	516	352	488	470	521	1733	311	782	1220	109
Grp Sat Flow(s),veh/h/ln	1687	1662	1547	1687	1662	1547	1687	1662	1547	1687	1662	1547
Q Serve(g_s), s	6.8	22.0	22.0	13.0	12.5	16.0	20.1	48.0	23.6	32.3	29.2	6.8
Cycle Q Clear(g_c), s	6.8	22.0	22.0	13.0	12.5	16.0	20.1	48.0	23.6	32.3	29.2	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	214	772	588	309	948	294	760	1685	523	832	1825	567
V/C Ratio(X)	0.76	1.06	0.88	1.14	0.51	1.60	0.69	1.03	0.59	0.94	0.67	0.19
Avail Cap(c_a), veh/h	214	772	588	309	948	294	760	1685	523	832	1825	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.4	60.0	22.5	64.5	51.6	20.1	50.4	47.0	38.9	52.5	37.8	30.7
Incr Delay (d2), s/veh	22.3	48.4	16.7	94.5	2.0	284.3	5.0	29.6	4.9	19.7	2.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.3	18.8	23.2	15.3	9.1	45.4	13.7	32.4	14.5	22.1	17.5	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.8	108.4	39.2	159.0	53.6	304.4	55.4	76.6	43.9	72.2	39.7	31.4
LnGrp LOS	F	F	D	F	D	F	E	F	D	E	D	C
Approach Vol, veh/h	1495			1310			2565			2111		
Approach Delay, s/veh	82.3			171.9			68.3			51.3		
Approach LOS	F			F			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	41.0	54.0	19.0	28.0	37.0	58.0	14.0	33.0				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	35.0	* 48	13.0	* 22	32.0	51.0	9.0	26.0				
Max Q Clear Time (g_c+I1), s	34.3	50.0	15.0	24.0	22.1	31.2	8.8	18.0				
Green Ext Time (p_c), s	0.3	0.0	0.0	0.0	1.4	8.5	0.0	3.0				

Intersection Summary

HCM 6th Ctrl Delay 84.4

HCM 6th LOS F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues
2: N-S Collector & 48th Ave

2045 Total Conditions
AM Peak

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1191	630	38	1099	146	13
v/c Ratio	0.64	0.58	0.25	0.59	0.29	0.03
Control Delay	11.6	3.2	12.5	10.9	17.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	3.2	12.5	10.9	17.7	8.4
Queue Length 50th (ft)	143	0	7	127	40	0
Queue Length 95th (ft)	201	40	25	178	80	10
Internal Link Dist (ft)	1226			1935	3283	
Turn Bay Length (ft)		200	200			
Base Capacity (vph)	1862	1083	152	1862	505	461
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.25	0.59	0.29	0.03
Intersection Summary						







HCM 6th Signalized Intersection Summary 2: N-S Collector & 48th Ave

2045 Total Conditions
AM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↙	↑↑	↙	↗
Traffic Volume (veh/h)	1096	580	35	1011	134	12
Future Volume (veh/h)	1096	580	35	1011	134	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1752	1752	1826	1752	1752
Adj Flow Rate, veh/h	1191	630	38	1099	146	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	10	10	5	10	10
Cap, veh/h	1879	804	193	1879	514	458
Arrive On Green	0.54	0.54	0.54	0.54	0.31	0.31
Sat Flow, veh/h	3561	1485	240	3561	1668	1485
Grp Volume(v), veh/h	1191	630	38	1099	146	13
Grp Sat Flow(s),veh/h/ln	1735	1485	240	1735	1668	1485
Q Serve(g_s), s	14.4	20.3	7.9	12.8	4.0	0.4
Cycle Q Clear(g_c), s	14.4	20.3	22.2	12.8	4.0	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1879	804	193	1879	514	458
V/C Ratio(X)	0.63	0.78	0.20	0.58	0.28	0.03
Avail Cap(c_a), veh/h	1879	804	193	1879	514	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	10.9	17.4	9.2	15.7	14.5
Incr Delay (d2), s/veh	1.6	7.5	2.3	1.3	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.3	11.2	0.9	7.5	2.8	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.2	18.5	19.6	10.6	17.1	14.6
LnGrp LOS	B	B	B	B	B	B
Approach Vol, veh/h	1821			1137	159	
Approach Delay, s/veh	13.7			10.9	16.9	
Approach LOS	B			B	B	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	23.0		37.0		37.0	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.5		32.5		32.5	
Max Q Clear Time (g_c+I1), s	6.0		22.3		24.2	
Green Ext Time (p_c), s	0.3		7.3		5.1	
Intersection Summary						
HCM 6th Ctrl Delay			12.9			
HCM 6th LOS			B			

Queues
3: 48th Ave







2045 Total Conditions
AM Peak

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	923	195	18	1025	46	8
v/c Ratio	0.67	0.28	0.12	0.75	0.07	0.01
Control Delay	14.1	3.1	10.9	15.8	8.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	3.1	10.9	15.8	8.8	5.4
Queue Length 50th (ft)	96	0	3	112	7	0
Queue Length 95th (ft)	147	27	13	170	21	6
Internal Link Dist (ft)	1935			1111	3264	
Turn Bay Length (ft)		150	150			200
Base Capacity (vph)	1375	704	153	1375	656	592
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.28	0.12	0.75	0.07	0.01
Intersection Summary						

HCM 6th Signalized Intersection Summary







3: 48th Ave

2045 Total Conditions
AM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (veh/h)	849	179	17	943	42	7
Future Volume (veh/h)	849	179	17	943	42	7
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1752	1752	1826	1752	1752
Adj Flow Rate, veh/h	923	195	18	1025	46	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	10	10	5	10	10
Cap, veh/h	1388	594	246	1388	667	594
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	3561	1485	472	3561	1668	1485
Grp Volume(v), veh/h	923	195	18	1025	46	8
Grp Sat Flow(s),veh/h/ln	1735	1485	472	1735	1668	1485
Q Serve(g_s), s	9.8	4.1	1.5	11.3	0.8	0.1
Cycle Q Clear(g_c), s	9.8	4.1	11.2	11.3	0.8	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1388	594	246	1388	667	594
V/C Ratio(X)	0.67	0.33	0.07	0.74	0.07	0.01
Avail Cap(c_a), veh/h	1388	594	246	1388	667	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	9.3	15.6	11.5	8.3	8.1
Incr Delay (d2), s/veh	2.5	1.5	0.6	3.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.1	2.3	0.3	7.3	0.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.6	10.8	16.2	15.1	8.5	8.2
LnGrp LOS	B	B	B	B	A	A
Approach Vol, veh/h	1118			1043	54	
Approach Delay, s/veh	13.1			15.1	8.5	
Approach LOS	B			B	A	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	22.5		22.5		22.5	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.0		18.0		18.0	
Max Q Clear Time (g_c+l1), s	2.8		11.8		13.3	
Green Ext Time (p_c), s	0.1		3.5		2.8	
Intersection Summary						
HCM 6th Ctrl Delay			13.9			
HCM 6th LOS			B			













Queues
4: Monaghan Rd & 48th Ave

2045 Total Conditions
AM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	147	697	629	267	364	360
v/c Ratio	0.29	0.42	0.60	0.15	0.38	0.36
Control Delay	18.0	4.0	10.4	6.9	18.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	4.0	10.4	6.9	18.1	4.2
Queue Length 50th (ft)	40	28	59	22	54	31
Queue Length 95th (ft)	80	55	88	37	86	62
Internal Link Dist (ft)	1111			680	660	
Turn Bay Length (ft)			250			250
Base Capacity (vph)	515	1666	1046	1749	954	990
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.42	0.60	0.15	0.38	0.36
Intersection Summary						

HCM 2010 Signalized Intersection Summary
4: Monaghan Rd & 48th Ave

2045 Total Conditions
AM Peak

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	135	641	579	246	335	331		
Future Volume (veh/h)	135	641	579	246	335	331		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1810	1810	1674	1674	1674	1674		
Adj Flow Rate, veh/h	147	697	629	267	364	360		
Adj No. of Lanes	1	2	2	2	2	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	5	5	5	5	5	5		
Cap, veh/h	517	1286	1047	1749	954	854		
Arrive On Green	0.30	0.30	0.17	0.55	0.30	0.30		
Sat Flow, veh/h	1723	2707	3093	3264	3264	1423		
Grp Volume(v), veh/h	147	697	629	267	364	360		
Grp Sat Flow(s),veh/h/ln	1723	1354	1546	1590	1590	1423		
Q Serve(g_s), s	3.9	10.9	7.5	2.5	5.4	8.1		
Cycle Q Clear(g_c), s	3.9	10.9	7.5	2.5	5.4	8.1		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	517	1286	1047	1749	954	854		
V/C Ratio(X)	0.28	0.54	0.60	0.15	0.38	0.42		
Avail Cap(c_a), veh/h	517	1286	1047	1749	954	854		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	16.1	11.1	10.0	6.6	16.6	6.4		
Incr Delay (d2), s/veh	1.4	1.6	2.6	0.2	1.2	1.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	3.7	14.0	6.2	2.0	4.6	9.8		
LnGrp Delay(d),s/veh	17.4	12.8	12.6	6.8	17.8	8.0		
LnGrp LOS	B	B	B	A	B	A		
Approach Vol, veh/h	844			896	724			
Approach Delay, s/veh	13.6			10.9	12.9			
Approach LOS	B			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		37.5		22.5	15.0	22.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		33.0		18.0	10.5	18.0		
Max Q Clear Time (g_c+l1), s		4.5		12.9	9.5	10.1		
Green Ext Time (p_c), s		1.8		1.7	0.3	2.4		
Intersection Summary								
HCM 2010 Ctrl Delay			12.4					
HCM 2010 LOS			B					

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↗↘	↗↘	↗
Traffic Vol, veh/h	0	20	65	825	908	68
Future Vol, veh/h	0	20	65	825	908	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	15	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	5	5	10
Mvmt Flow	0	22	71	897	987	74
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	494	1061	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	4.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4	2.3	-	-	-
Pot Cap-1 Maneuver	0	500	607	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	500	607	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.5	0.9		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	607	-	500	-	-	
HCM Lane V/C Ratio	0.116	-	0.043	-	-	
HCM Control Delay (s)	11.7	-	12.5	-	-	
HCM Lane LOS	B	-	B	-	-	
HCM 95th %tile Q(veh)	0.4	-	0.1	-	-	

Queues

2045 Total Conditions

6: Powhaton Rd & E-W Road

AM Peak



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	70	79	2592	518	226	1861
v/c Ratio	0.15	0.19	0.90	0.48	2.15	0.64
Control Delay	18.9	19.2	17.5	2.5	567.0	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	19.2	17.5	2.5	567.0	10.3
Queue Length 50th (ft)	21	23	291	1	~107	159
Queue Length 95th (ft)	49	54	#375	35	#232	203
Internal Link Dist (ft)	1600		1273			3220
Turn Bay Length (ft)				150	250	
Base Capacity (vph)	454	407	2888	1069	105	2888
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.19	0.90	0.48	2.15	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.













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

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary







6: Powhatan Rd & E-W Road

2045 Total Conditions
AM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	73	2385	477	208	1712
Future Volume (veh/h)	64	73	2385	477	208	1712
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1752	1752	1826	1752	1752	1826
Adj Flow Rate, veh/h	70	79	2592	518	226	1861
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	5	10	10	5
Cap, veh/h	462	411	2914	868	120	2914
Arrive On Green	0.28	0.28	0.58	0.58	0.58	0.58
Sat Flow, veh/h	1668	1485	5149	1485	66	5149
Grp Volume(v), veh/h	70	79	2592	518	226	1861
Grp Sat Flow(s),veh/h/ln	1668	1485	1662	1485	66	1662
Q Serve(g_s), s	2.1	2.6	29.2	14.5	8.8	16.1
Cycle Q Clear(g_c), s	2.1	2.6	29.2	14.5	38.0	16.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	462	411	2914	868	120	2914
V/C Ratio(X)	0.15	0.19	0.89	0.60	1.89	0.64
Avail Cap(c_a), veh/h	462	411	2914	868	120	2914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	17.9	11.7	8.6	32.2	8.9
Incr Delay (d2), s/veh	0.7	1.0	4.6	3.0	429.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	1.7	14.6	7.8	29.0	8.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.4	19.0	16.2	11.6	461.5	10.0
LnGrp LOS	B	B	B	B	F	B
Approach Vol, veh/h	149		3110			2087
Approach Delay, s/veh	18.7		15.5			58.9
Approach LOS	B		B			E
Timer - Assigned Phs	2		6		8	
Phs Duration (G+Y+Rc), s	42.5		42.5		22.5	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	38.0		38.0		18.0	
Max Q Clear Time (g_c+l1), s	31.2		40.0		4.6	
Green Ext Time (p_c), s	6.5		0.0		0.3	
Intersection Summary						
HCM 6th Ctrl Delay			32.5			
HCM 6th LOS			C			













Queues
7: Monaghan Rd & E-W Road

2045 Total Conditions
AM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	16	37	167	1060	909	89
v/c Ratio	0.09	0.07	0.29	0.40	0.46	0.08
Control Delay	59.9	9.0	3.6	3.4	18.8	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	9.0	3.6	3.4	18.8	1.4
Queue Length 50th (ft)	14	0	24	104	253	0
Queue Length 95th (ft)	39	25	38	125	305	16
Internal Link Dist (ft)	1068			1855	2501	
Turn Bay Length (ft)		200	250			250
Base Capacity (vph)	179	561	571	2657	1978	1071
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.29	0.40	0.46	0.08
Intersection Summary						

HCM 2010 Signalized Intersection Summary
7: Monaghan Rd & E-W Road

2045 Total Conditions
AM Peak













								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	15	34	154	975	836	82		
Future Volume (veh/h)	15	34	154	975	836	82		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1727	1727	1598	1674	1810	1727		
Adj Flow Rate, veh/h	16	37	167	1060	909	89		
Adj No. of Lanes	1	1	1	2	2	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	10	10	10	5	5	10		
Cap, veh/h	180	498	602	2657	1978	1006		
Arrive On Green	0.11	0.11	0.23	0.84	0.58	0.58		
Sat Flow, veh/h	1645	1468	1522	3264	3529	1468		
Grp Volume(v), veh/h	16	37	167	1060	909	89		
Grp Sat Flow(s),veh/h/ln	1645	1468	1522	1590	1719	1468		
Q Serve(g_s), s	1.3	2.5	3.3	12.0	22.3	3.0		
Cycle Q Clear(g_c), s	1.3	2.5	3.3	12.0	22.3	3.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	180	498	602	2657	1978	1006		
V/C Ratio(X)	0.09	0.07	0.28	0.40	0.46	0.09		
Avail Cap(c_a), veh/h	180	498	602	2657	1978	1006		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	58.4	32.7	5.8	3.0	17.9	7.7		
Incr Delay (d2), s/veh	1.0	0.3	1.1	0.4	0.8	0.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	1.1	4.5	3.4	9.1	16.1	3.0		
LnGrp Delay(d),s/veh	59.4	33.0	6.9	3.4	18.7	7.9		
LnGrp LOS	E	C	A	A	B	A		
Approach Vol, veh/h	53			1227	998			
Approach Delay, s/veh	41.0			3.9	17.7			
Approach LOS	D			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		126.0		20.0	38.0	88.0		
Change Period (Y+Rc), s		4.0		4.0	4.5	4.0		
Max Green Setting (Gmax), s		122.0		16.0	33.5	84.0		
Max Q Clear Time (g_c+I1), s		14.0		4.5	5.3	24.3		
Green Ext Time (p_c), s		10.7		0.1	0.5	8.8		
Intersection Summary								
HCM 2010 Ctrl Delay			10.8					
HCM 2010 LOS			B					

Queues

8: Powhatan Rd & 38th Ave

2045 Total Conditions

AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	171	186	114	42	68	87	2870	418	329	1551	60
v/c Ratio	1.00	0.78	0.52	0.51	0.23	0.28	0.48	1.03	0.42	0.86	0.54	0.06
Control Delay	156.9	87.7	13.2	69.6	64.9	6.0	61.2	58.9	14.3	86.6	20.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	156.9	87.7	13.2	69.6	64.9	6.0	61.2	58.9	14.3	86.6	20.2	0.1
Queue Length 50th (ft)	103	165	0	53	38	0	82	~1081	179	165	328	0
Queue Length 95th (ft)	#234	#281	75	86	79	17	m96	#1162	m264	#247	369	0
Internal Link Dist (ft)		530			1744			2609			488	
Turn Bay Length (ft)	350		350	350		250	350		350	350		350
Base Capacity (vph)	103	218	357	225	184	247	183	2799	985	381	2865	950
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.78	0.52	0.51	0.23	0.28	0.48	1.03	0.42	0.86	0.54	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

























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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary 8: Powhatan Rd & 38th Ave

2045 Total Conditions
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	157	171	105	39	63	80	2640	385	303	1427	55
Future Volume (veh/h)	95	157	171	105	39	63	80	2640	385	303	1427	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1752	1826	1752	1752	1752	1826	1826	1752	1752	1826	1826
Adj Flow Rate, veh/h	103	171	186	114	42	0	87	2870	418	329	1551	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	10	5	10	10	10	5	5	10	10	5	5
Cap, veh/h	104	232	205	224	186		184	2806	895	386	2872	
Arrive On Green	0.06	0.13	0.13	0.04	0.11	0.00	0.11	0.56	0.56	0.12	0.58	0.00
Sat Flow, veh/h	1739	1752	1547	3237	1752	1485	1739	4985	1485	3237	4985	1547
Grp Volume(v), veh/h	103	171	186	114	42	0	87	2870	418	329	1551	0
Grp Sat Flow(s),veh/h/ln	1739	1752	1547	1618	1752	1485	1739	1662	1485	1618	1662	1547
Q Serve(g_s), s	8.9	14.2	17.9	5.0	3.3	0.0	7.1	85.0	23.5	15.0	28.9	0.0
Cycle Q Clear(g_c), s	8.9	14.2	17.9	5.0	3.3	0.0	7.1	85.0	23.5	15.0	28.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	104	232	205	224	186		184	2806	895	386	2872	
V/C Ratio(X)	0.99	0.74	0.91	0.51	0.23		0.47	1.02	0.47	0.85	0.54	
Avail Cap(c_a), veh/h	104	232	205	224	186		184	2806	895	386	2872	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	71.0	63.0	64.6	65.5	61.8	0.0	63.5	33.0	16.6	65.2	19.7	0.0
Incr Delay (d2), s/veh	86.7	18.8	42.6	8.0	2.8	0.0	8.4	23.1	1.8	20.6	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.7	12.1	14.6	4.2	2.9	0.0	6.5	50.3	13.2	11.8	16.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	157.7	81.7	107.2	73.6	64.6	0.0	72.0	56.1	18.3	85.8	20.4	0.0
LnGrp LOS	F	F	F	E	E		E	F	B	F	C	
Approach Vol, veh/h	460			156			3375			1880		
Approach Delay, s/veh	109.0			71.2			51.8			31.9		
Approach LOS	F			E			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.0	91.0	11.0	26.0	21.0	93.0	15.0	22.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	6.0	* 6				
Max Green Setting (Gmax), s	18.0	85.0	6.0	19.0	16.0	87.0	9.0	* 16				
Max Q Clear Time (g_c+I1), s	17.0	87.0	7.0	19.9	9.1	30.9	10.9	5.3				
Green Ext Time (p_c), s	0.1	0.0	0.0	0.0	0.1	18.5	0.0	0.1				

Intersection Summary

HCM 6th Ctrl Delay	50.4
HCM 6th LOS	D

Notes













* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection

Intersection Delay, s/veh21.4

Intersection LOS C







Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	103	319	184	12	120	30	33	185	3	68	287	42
Future Vol, veh/h	103	319	184	12	120	30	33	185	3	68	287	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	112	347	200	13	130	33	36	201	3	74	312	46
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	22.7	14.8	18.3	24
HCM LOS	C	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	185	3	103	319	184	12	120	30	68	287	42
LT Vol	33	0	0	103	0	0	12	0	0	68	0	0
Through Vol	0	185	0	0	319	0	0	120	0	0	287	0
RT Vol	0	0	3	0	0	184	0	0	30	0	0	42
Lane Flow Rate	36	201	3	112	347	200	13	130	33	74	312	46
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.091	0.484	0.007	0.257	0.748	0.393	0.034	0.321	0.074	0.178	0.708	0.095
Departure Headway (Hd)	9.156	8.656	7.956	8.271	7.771	7.071	9.371	8.871	8.171	8.667	8.167	7.467
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	390	414	448	433	465	508	381	404	437	413	443	478
Service Time	6.934	6.434	5.734	6.036	5.536	4.836	7.156	6.656	5.956	6.434	5.934	5.234
HCM Lane V/C Ratio	0.092	0.486	0.007	0.259	0.746	0.394	0.034	0.322	0.076	0.179	0.704	0.096
HCM Control Delay	12.9	19.4	10.8	13.9	30.3	14.4	12.5	15.8	11.6	13.3	28.5	11
HCM Lane LOS	B	C	B	B	D	B	B	C	B	B	D	B
HCM 95th-tile Q	0.3	2.6	0	1	6.2	1.9	0.1	1.4	0.2	0.6	5.4	0.3













Queues
10: Monaghan Rd & 38th Ave

2045 Total Conditions
AM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	51	65	103	1253	791	99
v/c Ratio	0.09	0.12	0.38	0.72	0.45	0.12
Control Delay	13.5	5.0	13.6	13.3	9.7	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	5.0	13.6	13.3	9.7	2.4
Queue Length 50th (ft)	11	0	19	151	78	0
Queue Length 95th (ft)	31	21	52	217	115	17
Internal Link Dist (ft)	3296			2768	1855	
Turn Bay Length (ft)			250			250
Base Capacity (vph)	537	524	269	1750	1750	795
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.12	0.38	0.72	0.45	0.12
Intersection Summary						











HCM 6th Signalized Intersection Summary 10: Monaghan Rd & 38th Ave

2045 Total Conditions
AM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	60	95	1153	728	91
Future Volume (veh/h)	47	60	95	1153	728	91
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1826	1826	1752
Adj Flow Rate, veh/h	51	65	103	1253	791	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	5	5	10
Cap, veh/h	546	486	344	1766	1766	756
Arrive On Green	0.33	0.33	0.51	0.51	0.51	0.51
Sat Flow, veh/h	1668	1485	585	3561	3561	1485
Grp Volume(v), veh/h	51	65	103	1253	791	99
Grp Sat Flow(s),veh/h/ln	1668	1485	585	1735	1735	1485
Q Serve(g_s), s	1.2	1.7	7.5	15.3	8.0	1.9
Cycle Q Clear(g_c), s	1.2	1.7	15.4	15.3	8.0	1.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	546	486	344	1766	1766	756
V/C Ratio(X)	0.09	0.13	0.30	0.71	0.45	0.13
Avail Cap(c_a), veh/h	546	486	344	1766	1766	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.8	13.0	13.5	10.4	8.6	7.1
Incr Delay (d2), s/veh	0.3	0.6	2.2	2.4	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	1.0	1.9	8.8	4.6	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.2	13.6	15.7	12.8	9.4	7.5
LnGrp LOS	B	B	B	B	A	A
Approach Vol, veh/h	116			1356	890	
Approach Delay, s/veh	13.4			13.0	9.2	
Approach LOS	B			B	A	
Timer - Assigned Phs	2			4		6
Phs Duration (G+Y+Rc), s	32.5			22.5		32.5
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	28.0			18.0		28.0
Max Q Clear Time (g_c+l1), s	17.4			3.7		10.0
Green Ext Time (p_c), s	6.8			0.2		5.7
Intersection Summary						
HCM 6th Ctrl Delay			11.6			
HCM 6th LOS			B			

Queues
11: Powhaton Rd

2045 Total Conditions
AM Peak

												
Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Group Flow (vph)	43	76	60	29	33	3417	370	125	1695	22		
v/c Ratio	0.20	0.30	0.31	0.16	0.18	0.84	0.30	2.72	0.42	0.02		
Control Delay	62.3	18.6	65.0	43.9	5.3	10.5	1.4	840.9	3.3	0.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	62.3	18.6	65.0	43.9	5.3	10.5	1.4	840.9	3.3	0.8		
Queue Length 50th (ft)	39	6	55	16	6	593	15	~210	95	0		
Queue Length 95th (ft)	79	57	103	49	15	642	33	#350	99	m2		
Internal Link Dist (ft)						1008					2609	
Turn Bay Length (ft)					150			150	200			150
Base Capacity (vph)	212	250	196	185	184	4050	1253	46	4050	1302		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.20	0.30	0.31	0.16	0.18	0.84	0.30	2.72	0.42	0.02		

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.























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

Queue shown is maximum after two cycles.

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






HCM 6th Signalized Intersection Summary 11: Powhaton Rd

2045 Total Conditions
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	70	55	0	27	30	3144	340	115	1559	20
Future Volume (veh/h)	40	0	70	55	0	27	30	3144	340	115	1559	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1752	1870	1752	1870	1826	1752	1752	1826	1870
Adj Flow Rate, veh/h	43	0	76	60	0	29	33	3417	370	125	1695	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	10	2	10	2	5	10	10	5	2
Cap, veh/h	245	0	238	193	0	238	292	3431	1022	142	3464	1102
Arrive On Green	0.15	0.00	0.15	0.15	0.00	0.15	0.04	0.69	0.69	0.05	0.69	0.69
Sat Flow, veh/h	1381	0	1585	1239	0	1585	1781	4985	1485	1668	4985	1585
Grp Volume(v), veh/h	43	0	76	60	0	29	33	3417	370	125	1695	22
Grp Sat Flow(s),veh/h/ln	1381	0	1585	1239	0	1585	1781	1662	1485	1668	1662	1585
Q Serve(g_s), s	3.3	0.0	5.1	5.4	0.0	1.9	0.6	81.5	12.4	4.6	18.9	0.5
Cycle Q Clear(g_c), s	5.2	0.0	5.1	10.6	0.0	1.9	0.6	81.5	12.4	4.6	18.9	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	245	0	238	193	0	238	292	3431	1022	142	3464	1102
V/C Ratio(X)	0.18	0.00	0.32	0.31	0.00	0.12	0.11	1.00	0.36	0.88	0.49	0.02
Avail Cap(c_a), veh/h	245	0	238	193	0	238	292	3431	1022	142	3464	1102
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	0.0	45.5	50.3	0.0	44.2	6.0	18.5	7.8	40.1	8.5	5.7
Incr Delay (d2), s/veh	1.6	0.0	3.5	4.2	0.0	1.0	0.8	14.4	1.0	48.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	0.0	4.1	3.5	0.0	1.5	0.5	41.0	7.2	7.9	10.5	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.0	0.0	49.0	54.4	0.0	45.2	6.7	33.0	8.8	88.5	9.0	5.7
LnGrp LOS	D	A	D	D	A	D	A	C	A	F	A	A
Approach Vol, veh/h	119			89			3820			1842		
Approach Delay, s/veh	48.7			51.4			30.4			14.3		
Approach LOS	D			D			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.4	87.1		22.5	9.6	87.9		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.9	82.6		18.0	5.1	83.4		18.0				
Max Q Clear Time (g_c+I1), s	6.6	83.5		7.2	2.6	20.9		12.6				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	22.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	26.0											
HCM 6th LOS	C											

HCM 6th TWSC
12: Monaghan Rd & Creek Ave

2045 Total Conditions
AM Peak

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	116	1248	665	123
Future Vol, veh/h	0	11	116	1248	665	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	5	5	10
Mvmt Flow	0	12	126	1357	723	134
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	362	857	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	4.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4	2.3	-	-	-
Pot Cap-1 Maneuver	0	612	730	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	612	730	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11	0.9		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	730	-	612	-	-	
HCM Lane V/C Ratio	0.173	-	0.02	-	-	
HCM Control Delay (s)	11	-	11	-	-	
HCM Lane LOS	B	-	B	-	-	
HCM 95th %tile Q(veh)	0.6	-	0.1	-	-	

Lanes, Volumes, Timings

13:

2045 Total

AM Peak Hour

	→	↘	↙	↖		
Lane Group	EBT	EBR2	NWL	NWT	Ø3	Ø4
Lane Configurations	↑↑	↑	↘	↑↑		
Traffic Volume (vph)	978	350	212	749		
Future Volume (vph)	978	350	212	749		
Ideal Flow (vphpl)	1900	1900	1900	1900		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3539	1583	1770	3539		
Flt Permitted			0.950			
Satd. Flow (perm)	3539	1583	1770	3539		
Right Turn on Red		Yes				
Satd. Flow (RTOR)		380				
Link Speed (mph)	30			30		
Link Distance (ft)	322			317		
Travel Time (s)	7.3			7.2		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	1063	380	230	814		
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1063	380	230	814		
Turn Type	NA	Perm	Perm	NA		
Protected Phases	2			4 3	3	4
Permitted Phases		2	4 3			
Total Split (s)	29.0	29.0			6.0	35.0
Total Lost Time (s)	4.0	4.0				
Act Effect Green (s)	30.1	30.1	31.9	31.9		
Actuated g/C Ratio	0.43	0.43	0.46	0.46		
v/c Ratio	0.70	0.42	0.29	0.50		
Control Delay	20.8	3.6	10.9	12.5		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	20.8	3.6	10.9	12.5		
LOS	C	A	B	B		
Approach Delay	16.2			12.1		
Approach LOS	B			B		

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 40 (57%), Referenced to phase 2:EBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 14.5

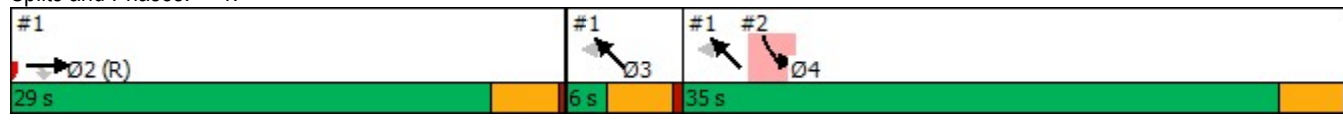
Intersection LOS: B

Intersection Capacity Utilization 54.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1:


















Lanes, Volumes, Timings

2045 Total










14:

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑									↑↑	
Traffic Volume (vph)	0	862	0	0	0	0	0	0	0	0	711	0
Future Volume (vph)	0	862	0	0	0	0	0	0	0	0	711	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	3539	0	0	0	0	0	0	0	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	3539	0	0	0	0	0	0	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes	Yes		
Satd. Flow (RTOR)												
Link Speed (mph)	30				30			30			30	
Link Distance (ft)	187				321			181			334	
Travel Time (s)	4.3				7.3			4.1			7.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	937	0	0	0	0	0	0	0	0	773	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	937	0	0	0	0	0	0	0	0	773	0
Turn Type	NA											
Protected Phases	4 3											
Permitted Phases												
Total Split (s)											43.0	
Total Lost Time (s)											4.0	
Act Effct Green (s)	32.0											
Actuated g/C Ratio	0.46											
v/c Ratio	0.58											
Control Delay	18.4											
Queue Delay	0.0											
Total Delay	18.4											
LOS	B											
Approach Delay	18.4											
Approach LOS	B											
Intersection Summary												
Area Type:	Other											
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 0 (0%), Referenced to phase 2:SWT, Start of Green, Master Intersection												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.65												
Intersection Signal Delay: 17.0						Intersection LOS: B						
Intersection Capacity Utilization 50.1%						ICU Level of Service A						
Analysis Period (min) 15												
Splits and Phases: 3:												
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Queues
15: 26th Ave






















2045 Total Conditions
AM Peak





									
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	5	1007	539	150	374	188	391	828	362
v/c Ratio	0.01	0.73	0.57	0.48	0.27	0.29	0.57	0.60	0.57
Control Delay	8.4	15.3	4.0	16.6	9.8	7.4	14.5	13.0	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	15.3	4.0	16.6	9.8	7.4	14.5	13.0	13.6
Queue Length 50th (ft)	1	109	0	13	32	19	74	83	60
Queue Length 95th (ft)	5	166	45	36	55	50	140	128	124
Internal Link Dist (ft)		309			1460			166	
Turn Bay Length (ft)				200		200			
Base Capacity (vph)	383	1375	938	311	1375	656	687	1375	637
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.73	0.57	0.48	0.27	0.29	0.57	0.60	0.57
Intersection Summary									

HCM 6th Signalized Intersection Summary

15: 26th Ave

2045 Total Conditions
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	926	496	138	344	173	360	762	333	0	0	0
Future Volume (veh/h)	5	926	496	138	344	173	360	762	333	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826			
Adj Flow Rate, veh/h	5	1007	539	150	374	188	391	828	362			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5			
Cap, veh/h	431	1388	619	418	1388	619	696	1388	619			
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40			
Sat Flow, veh/h	828	3469	1547	634	3469	1547	1739	3469	1547			
Grp Volume(v), veh/h	5	1007	539	150	374	188	391	828	362			
Grp Sat Flow(s),veh/h/ln	828	1735	1547	317	1735	1547	1739	1735	1547			
Q Serve(g_s), s	0.2	11.0	14.4	7.0	3.3	3.7	7.8	8.5	8.2			
Cycle Q Clear(g_c), s	3.4	11.0	14.4	18.0	3.3	3.7	7.8	8.5	8.2			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	431	1388	619	418	1388	619	696	1388	619			
V/C Ratio(X)	0.01	0.73	0.87	0.36	0.27	0.30	0.56	0.60	0.58			
Avail Cap(c_a), veh/h	431	1388	619	418	1388	619	696	1388	619			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	10.2	11.4	12.4	20.2	9.1	9.2	10.4	10.6	10.6			
Incr Delay (d2), s/veh	0.0	3.3	15.5	2.4	0.5	1.3	3.3	1.9	4.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(95%),veh/ln	0.1	7.0	10.6	1.5	1.9	2.2	5.3	5.2	5.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	14.8	27.9	22.6	9.6	10.5	13.7	12.5	14.6			
LnGrp LOS	B	B	C	C	A	B	B	B	B			
Approach Vol, veh/h	1551			712			1581					
Approach Delay, s/veh	19.3			12.6			13.3					
Approach LOS	B			B			B					
Timer - Assigned Phs	2			4			8					
Phs Duration (G+Y+Rc), s	22.5			22.5			22.5					
Change Period (Y+Rc), s	4.5			4.5			4.5					
Max Green Setting (Gmax), s	18.0			18.0			18.0					
Max Q Clear Time (g_c+I1), s	10.5			16.4			20.0					
Green Ext Time (p_c), s	4.7			1.2			0.0					
Intersection Summary												
HCM 6th Ctrl Delay	15.6											
HCM 6th LOS	B											

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	111	1162	723	29	0	33
Future Vol, veh/h	111	1162	723	29	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	5	5	10	10	10
Mvmt Flow	121	1263	786	32	0	36

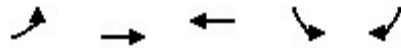
Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	818	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.3	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.3	-	-
Pot Cap-1 Maneuver	756	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	756	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	11.7
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	756	-	-	-	570
HCM Lane V/C Ratio	0.16	-	-	-	0.063
HCM Control Delay (s)	10.7	-	-	-	11.7
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.6	-	-	-	0.2

Queues
17: 26th Ave & N-S Collector

2045 Total Conditions
AM Peak



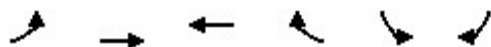
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	441	790	709	24	163
v/c Ratio	0.82	0.37	0.73	0.06	0.10
Control Delay	27.7	7.4	27.3	20.1	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	7.4	27.3	20.1	3.2
Queue Length 50th (ft)	120	79	141	8	6
Queue Length 95th (ft)	#271	110	200	25	18
Internal Link Dist (ft)		1009	2543	2452	
Turn Bay Length (ft)					200
Base Capacity (vph)	540	2107	970	424	1555
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.82	0.37	0.73	0.06	0.10

Intersection Summary

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

HCM 6th Signalized Intersection Summary
17: 26th Ave & N-S Collector













2045 Total Conditions
AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	406	727	591	62	22	150
Future Volume (veh/h)	406	727	591	62	22	150
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1752	1826	1826	1752	1752	1752
Adj Flow Rate, veh/h	441	790	642	67	24	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	5	5	10	10	10
Cap, veh/h	615	2126	901	94	431	1366
Arrive On Green	0.26	0.61	0.28	0.28	0.26	0.26
Sat Flow, veh/h	1668	3561	3262	330	1668	2613
Grp Volume(v), veh/h	441	790	351	358	24	163
Grp Sat Flow(s),veh/h/ln	1668	1735	1735	1766	1668	1306
Q Serve(g_s), s	10.6	8.0	12.7	12.7	0.8	2.2
Cycle Q Clear(g_c), s	10.6	8.0	12.7	12.7	0.8	2.2
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	615	2126	493	502	431	1366
V/C Ratio(X)	0.72	0.37	0.71	0.71	0.06	0.12
Avail Cap(c_a), veh/h	615	2126	493	502	431	1366
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.4	6.8	22.5	22.5	19.5	8.5
Incr Delay (d2), s/veh	7.0	0.5	8.5	8.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	4.5	10.0	10.2	0.6	4.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.4	7.3	30.9	30.9	19.8	8.7
LnGrp LOS	B	A	C	C	B	A
Approach Vol, veh/h		1231	709		187	
Approach Delay, s/veh		11.3	30.9		10.1	
Approach LOS		B	C		B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		47.4		22.6	23.0	24.4
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		42.9		18.1	18.5	19.9
Max Q Clear Time (g_c+l1), s		10.0		4.2	12.6	14.7
Green Ext Time (p_c), s		6.4		0.5	0.8	2.0
Intersection Summary						
HCM 6th Ctrl Delay			17.7			
HCM 6th LOS			B			

























Queues
18: Monaghan Rd & 26th Ave

2045 Total Conditions
AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	465	97	135	33	247	198	278	758	163	109	323	197
v/c Ratio	0.67	0.10	0.25	0.17	0.39	0.44	0.36	0.59	0.24	0.50	0.49	0.43
Control Delay	49.2	32.9	3.9	50.1	45.3	8.1	40.1	32.4	4.6	31.1	46.2	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	32.9	3.9	50.1	45.3	8.1	40.1	32.4	4.6	31.1	46.2	7.7
Queue Length 50th (ft)	172	29	0	23	89	0	93	245	0	46	118	0
Queue Length 95th (ft)	229	52	30	56	131	57	134	310	44	81	166	55
Internal Link Dist (ft)	2543			565			435			2472		
Turn Bay Length (ft)	350		350	350		350	350		350	350		350
Base Capacity (vph)	694	945	541	200	630	452	778	1289	679	217	658	463
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.10	0.25	0.17	0.39	0.44	0.36	0.59	0.24	0.50	0.49	0.43
Intersection Summary												

HCM 6th Signalized Intersection Summary 18: Monaghan Rd & 26th Ave

2045 Total Conditions
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	428	89	124	30	227	182	256	697	150	100	297	181
Future Volume (veh/h)	428	89	124	30	227	182	256	697	150	100	297	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	465	97	135	33	247	198	278	758	163	109	323	197
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	703	954	426	203	636	284	787	1301	580	260	665	297
Arrive On Green	0.21	0.28	0.28	0.12	0.18	0.18	0.23	0.38	0.38	0.05	0.19	0.19
Sat Flow, veh/h	3374	3469	1547	1739	3469	1547	3374	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	465	97	135	33	247	198	278	758	163	109	323	197
Grp Sat Flow(s),veh/h/ln	1687	1735	1547	1739	1735	1547	1687	1735	1547	1739	1735	1547
Q Serve(g_s), s	15.2	2.5	8.3	2.1	7.5	14.4	8.3	21.0	8.8	6.0	10.0	14.2
Cycle Q Clear(g_c), s	15.2	2.5	8.3	2.1	7.5	14.4	8.3	21.0	8.8	6.0	10.0	14.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	703	954	426	203	636	284	787	1301	580	260	665	297
V/C Ratio(X)	0.66	0.10	0.32	0.16	0.39	0.70	0.35	0.58	0.28	0.42	0.49	0.66
Avail Cap(c_a), veh/h	703	954	426	203	636	284	787	1301	580	260	665	297
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	32.4	34.6	47.7	43.1	45.9	38.4	30.0	26.2	36.8	43.2	44.9
Incr Delay (d2), s/veh	4.9	0.2	2.0	1.7	1.8	13.4	1.2	1.9	1.2	4.9	2.5	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.1	2.0	6.1	1.8	6.1	10.8	6.4	14.0	6.2	5.3	8.0	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.5	32.7	36.5	49.4	44.9	59.2	39.7	31.9	27.4	41.7	45.8	56.1
LnGrp LOS	D	C	D	D	D	E	D	C	C	D	D	E
Approach Vol, veh/h	697			478			1199			629		
Approach Delay, s/veh	44.0			51.1			33.1			48.3		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	51.0	19.0	39.0	33.0	29.0	30.0	28.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	6.0	45.0	14.0	33.0	28.0	23.0	25.0	22.0				
Max Q Clear Time (g_c+I1), s	8.0	23.0	4.1	10.3	10.3	16.2	17.2	16.4				
Green Ext Time (p_c), s	0.0	6.1	0.0	1.0	0.9	1.6	1.1	1.1				
Intersection Summary												
HCM 6th Ctrl Delay	41.7											
HCM 6th LOS	D											









HCM 6th AWSC
19: N-S Collector & E-W Road

2045 Total Conditions
AM Peak

Intersection






Intersection Delay, s/veh25.1

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	136	126	60	29	63	8	24	196	69	2	406	12
Future Vol, veh/h	136	126	60	29	63	8	24	196	69	2	406	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	148	137	65	32	68	9	26	213	75	2	441	13
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0






Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	15	12.5	18	40.6
HCM LOS	B	B	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	74%	0%	68%	0%	89%	0%	97%
Vol Right, %	0%	26%	0%	32%	0%	11%	0%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	265	136	186	29	71	2	418
LT Vol	24	0	136	0	29	0	2	0
Through Vol	0	196	0	126	0	63	0	406
RT Vol	0	69	0	60	0	8	0	12
Lane Flow Rate	26	288	148	202	32	77	2	454
Geometry Grp	5	5	5	5	5	5	5	5
Degree of Util (X)	0.056	0.564	0.331	0.41	0.076	0.174	0.004	0.873
Departure Headway (Hd)	7.747	7.047	8.049	7.305	8.694	8.095	7.447	6.917
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	462	513	446	493	411	442	481	522
Service Time	5.497	4.798	5.801	5.056	6.461	5.862	5.191	4.661
HCM Lane V/C Ratio	0.056	0.561	0.332	0.41	0.078	0.174	0.004	0.87
HCM Control Delay	11	18.6	14.8	15.1	12.2	12.6	10.2	40.7
HCM Lane LOS	B	C	B	C	B	B	B	E
HCM 95th-tile Q	0.2	3.5	1.4	2	0.2	0.6	0	9.5

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	99	8	5	223	284	22
Future Vol, veh/h	99	8	5	223	284	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	108	9	5	242	309	24
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	561	309	333	0	-	0
Stage 1	309	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Critical Hdwy	6.5	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	475	713	1183	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	772	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	473	713	1183	-	-	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	772	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.7	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1183	-	485	-	-	
HCM Lane V/C Ratio	0.005	-	0.24	-	-	
HCM Control Delay (s)	8.1	-	14.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.9	-	-	

HCM 6th TWSC
21: N-S Collector & Creek Ave

2045 Total Conditions
AM Peak

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	18	205	41	39	253
Future Vol, veh/h	48	18	205	41	39	253
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	200	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	52	20	223	45	42	275
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	582	223	0	0	268	0
Stage 1	223	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Critical Hdwy	6.5	6.3	-	-	4.2	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	2.29	-
Pot Cap-1 Maneuver	462	797	-	-	1251	-
Stage 1	796	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	446	797	-	-	1251	-
Mov Cap-2 Maneuver	446	-	-	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.3	0		1.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	507	1251	-	
HCM Lane V/C Ratio	-	-	0.141	0.034	-	
HCM Control Delay (s)	-	-	13.3	8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-	













Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕		
Traffic Vol, veh/h	63	11	12	103	41	92	5	5	18	20	5	30
Future Vol, veh/h	63	11	12	103	41	92	5	5	18	20	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	2	2	10	10	2	2	2	10	2	10
Mvmt Flow	68	12	13	112	45	100	5	5	20	22	5	33
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	145	0	0	25	0	0	493	524	19	486	480	95
Stage 1	-	-	-	-	-	-	155	155	-	319	319	-
Stage 2	-	-	-	-	-	-	338	369	-	167	161	-
Critical Hdwy	4.2	-	-	4.12	-	-	7.12	6.52	6.22	7.2	6.52	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.2	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.2	5.52	-
Follow-up Hdwy	2.29	-	-	2.218	-	-	3.518	4.018	3.318	3.59	4.018	3.39
Pot Cap-1 Maneuver	1390	-	-	1589	-	-	486	458	1059	479	485	940
Stage 1	-	-	-	-	-	-	847	769	-	676	653	-
Stage 2	-	-	-	-	-	-	676	621	-	817	765	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1390	-	-	1589	-	-	420	401	1059	421	425	940
Mov Cap-2 Maneuver	-	-	-	-	-	-	420	401	-	421	425	-
Stage 1	-	-	-	-	-	-	805	731	-	642	602	-
Stage 2	-	-	-	-	-	-	596	573	-	756	727	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	5.7			3.2			10.6			11.3		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	677	1390	-	-	1589	-	-	630				
HCM Lane V/C Ratio	0.045	0.049	-	-	0.07	-	-	0.086				
HCM Control Delay (s)	10.6	7.7	0	-	7.4	-	-	11.3				
HCM Lane LOS	B	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0.2	-	-	0.3				

Queues

2045 Total Conditions

1: Powhatan Rd & 48th Ave

PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	141	571	554	280	657	752	677	1602	351	540	1849	250
v/c Ratio	1.02	0.66	0.80	0.72	0.53	1.14	1.06	0.95	0.54	0.88	1.12	0.40
Control Delay	139.0	50.4	23.8	62.4	40.8	100.6	98.9	51.6	17.6	65.1	101.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.0	50.4	23.8	62.4	40.8	100.6	98.9	51.6	17.6	65.1	101.7	11.8
Queue Length 50th (ft)	~58	152	170	109	161	~449	~296	440	97	212	~605	42
Queue Length 95th (ft)	#127	195	274	157	203	#690	#415	#545	193	#306	#701	111
Internal Link Dist (ft)		930			718			3220			574	
Turn Bay Length (ft)	250		250	250		250	350		350	350		350
Base Capacity (vph)	138	864	690	389	1235	662	639	1687	649	611	1646	628
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.66	0.80	0.72	0.53	1.14	1.06	0.95	0.54	0.88	1.12	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

























Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

1: Powhatan Rd & 48th Ave

2045 Total Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	525	510	258	604	692	623	1474	323	497	1701	230
Future Volume (veh/h)	130	525	510	258	604	692	623	1474	323	497	1701	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	141	571	554	280	657	752	677	1602	351	540	1849	250
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	139	865	563	390	1236	384	641	1689	524	613	1689	524
Arrive On Green	0.04	0.17	0.17	0.12	0.25	0.25	0.19	0.34	0.34	0.18	0.34	0.34
Sat Flow, veh/h	3374	4985	1547	3374	4985	1547	3374	4985	1547	3374	4985	1547
Grp Volume(v), veh/h	141	571	554	280	657	752	677	1602	351	540	1849	250
Grp Sat Flow(s),veh/h/ln	1687	1662	1547	1687	1662	1547	1687	1662	1547	1687	1662	1547
Q Serve(g_s), s	5.0	12.9	21.0	9.7	13.8	30.0	23.0	37.9	23.5	18.9	41.0	12.3
Cycle Q Clear(g_c), s	5.0	12.9	21.0	9.7	13.8	30.0	23.0	37.9	23.5	18.9	41.0	12.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	865	563	390	1236	384	641	1689	524	613	1689	524
V/C Ratio(X)	1.01	0.66	0.98	0.72	0.53	1.96	1.06	0.95	0.67	0.88	1.09	0.48
Avail Cap(c_a), veh/h	139	865	563	390	1236	384	641	1689	524	613	1689	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	46.7	18.8	51.6	39.4	45.5	49.0	39.0	34.2	48.2	40.0	20.2
Incr Delay (d2), s/veh	79.3	3.9	34.3	10.8	1.6	441.4	51.2	12.7	6.7	16.5	52.6	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	5.5	13.6	4.6	5.7	58.1	13.9	16.7	9.4	9.1	24.1	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	137.3	50.6	53.2	62.4	41.1	486.9	100.2	51.7	40.9	64.7	92.6	23.3
LnGrp LOS	F	D	D	E	D	F	F	D	D	E	F	C
Approach Vol, veh/h	1266			1689			2630			2639		
Approach Delay, s/veh	61.4			243.1			62.7			80.3		
Approach LOS	E			F			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.0	47.0	19.0	27.0	28.0	47.0	10.0	36.0				
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	22.0	* 41	14.0	21.0	23.0	40.0	5.0	30.0				
Max Q Clear Time (g_c+l1), s	20.9	39.9	11.7	23.0	25.0	43.0	7.0	32.0				
Green Ext Time (p_c), s	0.3	1.0	0.2	0.0	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay 105.2

HCM 6th LOS F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues
2: N-S Collector & 48th Ave

2045 Total Conditions
PM Peak

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1192	172	11	1027	597	55
v/c Ratio	0.87	0.25	0.07	0.75	0.91	0.09
Control Delay	21.7	3.1	9.4	16.4	35.9	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	3.1	9.4	16.4	35.9	6.8
Queue Length 50th (ft)	140	0	2	140	137	5
Queue Length 95th (ft)	#252	26	m5	191	#303	21
Internal Link Dist (ft)	1226			1935	3283	
Turn Bay Length (ft)		200	200			
Base Capacity (vph)	1375	690	153	1375	656	598
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.25	0.07	0.75	0.91	0.09

Intersection Summary

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

Queue shown is maximum after two cycles.

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







HCM 6th Signalized Intersection Summary 2: N-S Collector & 48th Ave

2045 Total Conditions
PM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↙	↑↑	↙	↗
Traffic Volume (veh/h)	1097	158	10	945	549	51
Future Volume (veh/h)	1097	158	10	945	549	51
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1752	1752	1826	1752	1752
Adj Flow Rate, veh/h	1192	172	11	1027	597	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	10	10	5	10	10
Cap, veh/h	1388	594	192	1388	667	594
Arrive On Green	0.40	0.40	0.13	0.13	0.40	0.40
Sat Flow, veh/h	3561	1485	373	3561	1668	1485
Grp Volume(v), veh/h	1192	172	11	1027	597	55
Grp Sat Flow(s),veh/h/ln	1735	1485	373	1735	1668	1485
Q Serve(g_s), s	14.1	3.5	1.3	12.8	15.0	1.0
Cycle Q Clear(g_c), s	14.1	3.5	15.4	12.8	15.0	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1388	594	192	1388	667	594
V/C Ratio(X)	0.86	0.29	0.06	0.74	0.89	0.09
Avail Cap(c_a), veh/h	1388	594	192	1388	667	594
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	9.2	25.3	17.3	12.6	8.4
Incr Delay (d2), s/veh	7.1	1.2	0.6	3.6	16.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	1.0	0.2	5.8	7.4	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.4	10.4	25.9	20.9	29.5	8.7
LnGrp LOS	B	B	C	C	C	A
Approach Vol, veh/h	1364			1038	652	
Approach Delay, s/veh	18.3			20.9	27.7	
Approach LOS	B			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	22.5		22.5		22.5	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.0		18.0		18.0	
Max Q Clear Time (g_c+l1), s	17.0		16.1		17.4	
Green Ext Time (p_c), s	0.3		1.4		0.4	
Intersection Summary						
HCM 6th Ctrl Delay			21.2			
HCM 6th LOS			C			

Queues
3: 48th Ave

2045 Total Conditions
PM Peak

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1097	53	5	774	187	28
v/c Ratio	0.80	0.09	0.03	0.56	0.29	0.05
Control Delay	17.1	5.1	9.0	12.4	10.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	5.1	9.0	12.4	10.7	4.6
Queue Length 50th (ft)	176	6	1	76	31	0
Queue Length 95th (ft)	m207	m6	5	118	65	11
Internal Link Dist (ft)	1935			1111	3264	
Turn Bay Length (ft)		150	150			200
Base Capacity (vph)	1375	619	153	1375	656	602
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.09	0.03	0.56	0.29	0.05







Intersection Summary

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

HCM 6th Signalized Intersection Summary

3: 48th Ave

2045 Total Conditions
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (veh/h)	1009	49	5	712	172	26
Future Volume (veh/h)	1009	49	5	712	172	26
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1752	1752	1826	1752	1752
Adj Flow Rate, veh/h	1097	53	5	774	187	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	10	10	5	10	10
Cap, veh/h	1388	594	203	1388	667	594
Arrive On Green	0.13	0.13	0.40	0.40	0.40	0.40
Sat Flow, veh/h	3561	1485	458	3561	1668	1485
Grp Volume(v), veh/h	1097	53	5	774	187	28
Grp Sat Flow(s),veh/h/ln	1735	1485	458	1735	1668	1485
Q Serve(g_s), s	13.8	1.4	0.5	7.8	3.4	0.5
Cycle Q Clear(g_c), s	13.8	1.4	14.2	7.8	3.4	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1388	594	203	1388	667	594
V/C Ratio(X)	0.79	0.09	0.02	0.56	0.28	0.05
Avail Cap(c_a), veh/h	1388	594	203	1388	667	594
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	12.3	18.7	10.4	9.1	8.3
Incr Delay (d2), s/veh	4.7	0.3	0.2	1.6	1.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.4	0.1	2.3	1.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.4	12.6	18.9	12.0	10.2	8.4
LnGrp LOS	C	B	B	B	B	A
Approach Vol, veh/h	1150			779	215	
Approach Delay, s/veh	21.9			12.1	9.9	
Approach LOS	C			B	A	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	22.5		22.5		22.5	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.0		18.0		18.0	
Max Q Clear Time (g_c+l1), s	5.4		15.8		16.2	
Green Ext Time (p_c), s	0.5		1.5		0.9	
Intersection Summary						
HCM 6th Ctrl Delay			17.1			
HCM 6th LOS			B			

Queues
4: Monaghan Rd & 48th Ave

2045 Total Conditions
PM Peak















Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	340	688	525	454	407	178
v/c Ratio	0.82	0.43	0.82	0.23	0.39	0.19
Control Delay	40.5	4.6	41.6	8.9	17.1	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	4.6	41.6	8.9	17.1	4.1
Queue Length 50th (ft)	116	31	143	64	58	17
Queue Length 95th (ft)	#242	60	#204	86	92	37
Internal Link Dist (ft)	1111			680	660	
Turn Bay Length (ft)			250			250
Base Capacity (vph)	415	1598	642	1934	1033	925
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.43	0.82	0.23	0.39	0.19

Intersection Summary

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

HCM 2010 Signalized Intersection Summary
4: Monaghan Rd & 48th Ave

2045 Total Conditions
PM Peak

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	313	633	483	418	374	164		
Future Volume (veh/h)	313	633	483	418	374	164		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1810	1810	1674	1674	1674	1674		
Adj Flow Rate, veh/h	340	688	525	454	407	178		
Adj No. of Lanes	1	2	2	2	2	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	5	5	5	5	5	5		
Cap, veh/h	416	1218	644	1935	1034	806		
Arrive On Green	0.24	0.24	0.21	0.61	0.32	0.32		
Sat Flow, veh/h	1723	2707	3093	3264	3264	1423		
Grp Volume(v), veh/h	340	688	525	454	407	178		
Grp Sat Flow(s),veh/h/ln	1723	1354	1546	1590	1590	1423		
Q Serve(g_s), s	11.2	11.2	9.7	3.9	5.9	3.7		
Cycle Q Clear(g_c), s	11.2	11.2	9.7	3.9	5.9	3.7		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	416	1218	644	1935	1034	806		
V/C Ratio(X)	0.82	0.56	0.81	0.23	0.39	0.22		
Avail Cap(c_a), veh/h	416	1218	644	1935	1034	806		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	21.5	12.2	22.6	5.4	15.7	6.4		
Incr Delay (d2), s/veh	16.1	1.9	10.9	0.3	1.1	0.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	7.1	9.1	5.1	1.8	2.8	4.3		
LnGrp Delay(d),s/veh	37.6	14.1	33.5	5.7	16.8	7.1		
LnGrp LOS	D	B	C	A	B	A		
Approach Vol, veh/h	1028			979	585			
Approach Delay, s/veh	21.8			20.6	13.8			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.0		19.0	17.0	24.0		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		36.5		14.5	12.5	19.5		
Max Q Clear Time (g_c+I1), s		5.9		13.2	11.7	7.9		
Green Ext Time (p_c), s		2.9		0.6	0.2	2.3		
Intersection Summary								
HCM 2010 Ctrl Delay			19.6					
HCM 2010 LOS			B					

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↕	↕	↗
Traffic Vol, veh/h	0	83	18	901	988	19
Future Vol, veh/h	0	83	18	901	988	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	15	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	5	5	10
Mvmt Flow	0	90	20	979	1074	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	537	1095	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	4.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4	2.3	-	-	-
Pot Cap-1 Maneuver	0	468	588	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	468	588	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.5	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	588	-	468	-	-	
HCM Lane V/C Ratio	0.033	-	0.193	-	-	
HCM Control Delay (s)	11.3	-	14.5	-	-	
HCM Lane LOS	B	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-	

Queues

2045 Total Conditions

6: Powhaton Rd & E-W Road

PM Peak

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	290	321	2484	141	62	2623
v/c Ratio	0.73	0.89	0.78	0.14	0.72	0.82
Control Delay	40.1	57.4	12.5	1.5	60.1	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	57.4	12.5	1.5	60.1	13.7
Queue Length 50th (ft)	133	153	286	1	18	320
Queue Length 95th (ft)	#243	#303	350	18	#96	392
Internal Link Dist (ft)	1600		1273			3220
Turn Bay Length (ft)				150	250	
Base Capacity (vph)	399	361	3180	993	86	3180
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.89	0.78	0.14	0.72	0.82













Intersection Summary

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

Queue shown is maximum after two cycles.







HCM 6th Signalized Intersection Summary 6: Powhaton Rd & E-W Road

2045 Total Conditions
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	267	295	2285	130	57	2413
Future Volume (veh/h)	267	295	2285	130	57	2413
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1752	1752	1826	1752	1752	1826
Adj Flow Rate, veh/h	290	321	2484	141	62	2623
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	5	10	10	5
Cap, veh/h	407	362	3209	956	121	3209
Arrive On Green	0.24	0.24	0.64	0.64	0.64	0.64
Sat Flow, veh/h	1668	1485	5149	1485	108	5149
Grp Volume(v), veh/h	290	321	2484	141	62	2623
Grp Sat Flow(s),veh/h/ln	1668	1485	1662	1485	108	1662
Q Serve(g_s), s	12.7	16.7	28.3	3.0	23.2	31.7
Cycle Q Clear(g_c), s	12.7	16.7	28.3	3.0	51.5	31.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	407	362	3209	956	121	3209
V/C Ratio(X)	0.71	0.89	0.77	0.15	0.51	0.82
Avail Cap(c_a), veh/h	407	362	3209	956	121	3209
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	29.2	10.1	5.6	34.1	10.7
Incr Delay (d2), s/veh	10.2	25.9	1.9	0.3	14.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	8.3	7.7	0.8	1.6	8.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.9	55.1	12.0	5.9	48.6	13.2
LnGrp LOS	D	E	B	A	D	B
Approach Vol, veh/h	611		2625			2685
Approach Delay, s/veh	46.9		11.7			14.0
Approach LOS	D		B			B
Timer - Assigned Phs	2		6		8	
Phs Duration (G+Y+Rc), s	56.0		56.0		24.0	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	51.5		51.5		19.5	
Max Q Clear Time (g_c+l1), s	30.3		53.5		18.7	
Green Ext Time (p_c), s	17.7		0.0		0.2	
Intersection Summary						
HCM 6th Ctrl Delay			16.4			
HCM 6th LOS			B			













Queues
7: Monaghan Rd & E-W Road

2045 Total Conditions
PM Peak

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	68	153	46	918	1118	24
v/c Ratio	0.25	0.41	0.16	0.38	0.42	0.02
Control Delay	46.3	10.4	8.9	8.9	5.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	10.4	8.9	8.9	5.1	0.0
Queue Length 50th (ft)	46	0	12	140	147	0
Queue Length 95th (ft)	91	59	29	183	164	m0
Internal Link Dist (ft)	1068			1855	2501	
Turn Bay Length (ft)		200	250			250
Base Capacity (vph)	273	372	279	2438	2635	1468
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.41	0.16	0.38	0.42	0.02
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 2010 Signalized Intersection Summary
7: Monaghan Rd & E-W Road

2045 Total Conditions
PM Peak













								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	63	141	42	845	1029	22		
Future Volume (veh/h)	63	141	42	845	1029	22		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1727	1727	1598	1674	1810	1727		
Adj Flow Rate, veh/h	68	153	46	918	1118	24		
Adj No. of Lanes	1	1	1	2	2	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	10	10	10	5	5	10		
Cap, veh/h	274	245	335	2438	2636	1370		
Arrive On Green	0.17	0.17	1.00	1.00	0.77	0.77		
Sat Flow, veh/h	1645	1468	421	3264	3529	1468		
Grp Volume(v), veh/h	68	153	46	918	1118	24		
Grp Sat Flow(s),veh/h/ln	1645	1468	421	1590	1719	1468		
Q Serve(g_s), s	4.3	11.6	2.2	0.0	13.5	0.1		
Cycle Q Clear(g_c), s	4.3	11.6	15.7	0.0	13.5	0.1		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	274	245	335	2438	2636	1370		
V/C Ratio(X)	0.25	0.63	0.14	0.38	0.42	0.02		
Avail Cap(c_a), veh/h	274	245	335	2438	2636	1370		
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	43.5	46.5	1.2	0.0	4.8	0.3		
Incr Delay (d2), s/veh	2.2	11.5	0.9	0.4	0.5	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.1	5.5	0.3	0.2	6.6	0.2		
LnGrp Delay(d),s/veh	45.6	58.0	2.0	0.4	5.3	0.3		
LnGrp LOS	D	E	A	A	A	A		
Approach Vol, veh/h	221			964	1142			
Approach Delay, s/veh	54.2			0.5	5.2			
Approach LOS	D			A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		96.0		24.0		96.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		92.0		20.0		92.0		
Max Q Clear Time (g_c+l1), s		17.7		13.6		15.5		
Green Ext Time (p_c), s		8.4		0.4		9.9		
Intersection Summary								
HCM 2010 Ctrl Delay			7.9					
HCM 2010 LOS			A					

Queues

8: Powhatan Rd & 38th Ave

2045 Total Conditions

PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	51	115	432	160	242	188	2186	122	97	2696	132
v/c Ratio	0.48	0.28	0.41	0.75	0.52	0.63	1.03	0.81	0.11	0.57	1.11	0.16
Control Delay	79.8	66.0	9.7	66.7	62.3	30.4	137.5	30.7	0.8	83.1	90.7	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.8	66.0	9.7	66.7	62.3	30.4	137.5	30.7	0.8	83.1	90.7	3.1
Queue Length 50th (ft)	58	47	0	207	143	87	~195	618	0	48	~1097	0
Queue Length 95th (ft)	109	92	39	269	222	186	#358	682	10	80	#1177	33
Internal Link Dist (ft)		530			1744			2609			488	
Turn Bay Length (ft)	350		350	350		250	350		350	350		350
Base Capacity (vph)	126	184	279	574	310	383	183	2700	1064	169	2437	828
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.28	0.41	0.75	0.52	0.63	1.03	0.81	0.11	0.57	1.11	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

























Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary 8: Powhatan Rd & 38th Ave













2045 Total Conditions
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	47	106	397	147	223	173	2011	112	89	2480	121
Future Volume (veh/h)	55	47	106	397	147	223	173	2011	112	89	2480	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1752	1752	1752	1752	1752	1826	1826	1752	1752	1826	1826
Adj Flow Rate, veh/h	60	51	115	432	160	0	188	2186	122	97	2696	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	10	10	10	10	10	5	5	10	10	5	5
Cap, veh/h	127	197	167	567	313		184	2707	1022	171	2443	
Arrive On Green	0.07	0.11	0.11	0.15	0.18	0.00	0.11	0.54	0.54	0.05	0.49	0.00
Sat Flow, veh/h	1739	1752	1485	3237	1752	1485	1739	4985	1485	3237	4985	1547
Grp Volume(v), veh/h	60	51	115	432	160	0	188	2186	122	97	2696	0
Grp Sat Flow(s),veh/h/ln	1739	1752	1485	1618	1752	1485	1739	1662	1485	1618	1662	1547
Q Serve(g_s), s	5.0	4.0	9.0	19.6	12.5	0.0	16.0	53.9	2.1	4.4	74.0	0.0
Cycle Q Clear(g_c), s	5.0	4.0	9.0	19.6	12.5	0.0	16.0	53.9	2.1	4.4	74.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	197	167	567	313		184	2707	1022	171	2443	
V/C Ratio(X)	0.47	0.26	0.69	0.76	0.51		1.02	0.81	0.12	0.57	1.10	
Avail Cap(c_a), veh/h	127	197	167	567	313		184	2707	1022	171	2443	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	67.2	61.2	41.1	61.6	56.0	0.0	67.5	28.1	2.5	69.8	38.5	0.0
Incr Delay (d2), s/veh	12.2	3.2	20.7	9.3	5.8	0.0	71.7	2.7	0.2	12.8	53.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.0	4.3	8.8	6.1	0.0	10.7	20.9	0.9	2.1	40.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.4	64.4	61.8	71.0	61.9	0.0	139.2	30.8	2.8	82.6	92.0	0.0
LnGrp LOS	E	E	E	E	E		F	C	A	F	F	
Approach Vol, veh/h	226				592				2496			
Approach Delay, s/veh	67.1				68.5				37.6			
Approach LOS	E				E				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	88.0	27.0	23.0	21.0	80.0	17.0	33.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	6.0	* 6				
Max Green Setting (Gmax), s	8.0	82.0	22.0	16.0	16.0	74.0	11.0	* 27				
Max Q Clear Time (g_c+I1), s	6.4	55.9	21.6	11.0	18.0	76.0	7.0	14.5				
Green Ext Time (p_c), s	0.0	18.8	0.1	0.2	0.0	0.0	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	66.4											
HCM 6th LOS	E											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Intersection

Intersection Delay, s/veh24.1

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	132	50	4	279	83	135	232	12	27	299	168
Future Vol, veh/h	28	132	50	4	279	83	135	232	12	27	299	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	30	143	54	4	303	90	147	252	13	29	325	183
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	15.8	28.1	21.4	26.8
HCM LOS	C	D	C	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	135	232	12	28	132	50	4	279	83	27	299	168
LT Vol	135	0	0	28	0	0	4	0	0	27	0	0
Through Vol	0	232	0	0	132	0	0	279	0	0	299	0
RT Vol	0	0	12	0	0	50	0	0	83	0	0	168
Lane Flow Rate	147	252	13	30	143	54	4	303	90	29	325	183
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.376	0.611	0.029	0.083	0.371	0.13	0.011	0.74	0.203	0.074	0.769	0.397
Departure Headway (Hd)	9.22	8.72	8.02	9.815	9.315	8.615	9.288	8.788	8.088	9.017	8.517	7.817
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	390	414	446	365	386	416	386	412	444	400	429	464
Service Time	6.968	6.468	5.768	7.568	7.068	6.368	7.034	6.534	5.834	6.717	6.217	5.517
HCM Lane V/C Ratio	0.377	0.609	0.029	0.082	0.37	0.13	0.01	0.735	0.203	0.072	0.758	0.394
HCM Control Delay	17.4	24.3	11	13.5	17.5	12.7	12.1	32.8	12.9	12.4	34.4	15.6
HCM Lane LOS	C	C	B	B	C	B	B	D	B	B	D	C
HCM 95th-tile Q	1.7	3.9	0.1	0.3	1.7	0.4	0	5.9	0.8	0.2	6.5	1.9

Queues
10: Monaghan Rd & 38th Ave

2045 Total Conditions
PM Peak















Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	124	122	65	796	1334	42
v/c Ratio	0.25	0.26	0.55	0.42	0.71	0.05
Control Delay	17.6	12.8	31.6	8.8	17.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	12.8	31.6	8.8	17.6	4.9
Queue Length 50th (ft)	34	21	14	79	270	2
Queue Length 95th (ft)	70	56	#71	114	306	19
Internal Link Dist (ft)	3296			2768	1855	
Turn Bay Length (ft)			250			250
Base Capacity (vph)	492	469	119	1890	1890	826
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.26	0.55	0.42	0.71	0.05

Intersection Summary

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











HCM 6th Signalized Intersection Summary 10: Monaghan Rd & 38th Ave

2045 Total Conditions
PM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	114	112	60	732	1227	39
Future Volume (veh/h)	114	112	60	732	1227	39
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1826	1826	1752
Adj Flow Rate, veh/h	124	122	65	796	1334	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	5	5	10
Cap, veh/h	501	445	245	1908	1908	817
Arrive On Green	0.30	0.30	0.55	0.55	0.73	0.73
Sat Flow, veh/h	1668	1485	369	3561	3561	1485
Grp Volume(v), veh/h	124	122	65	796	1334	42
Grp Sat Flow(s),veh/h/ln	1668	1485	369	1735	1735	1485
Q Serve(g_s), s	3.4	3.8	8.5	8.0	12.7	0.5
Cycle Q Clear(g_c), s	3.4	3.8	21.2	8.0	12.7	0.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	501	445	245	1908	1908	817
V/C Ratio(X)	0.25	0.27	0.27	0.42	0.70	0.05
Avail Cap(c_a), veh/h	501	445	245	1908	1908	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	16.0	15.9	7.9	5.3	3.7
Incr Delay (d2), s/veh	1.2	1.5	2.6	0.7	2.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.4	0.8	2.2	2.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.1	17.5	18.6	8.6	7.5	3.8
LnGrp LOS	B	B	B	A	A	A
Approach Vol, veh/h	246			861	1376	
Approach Delay, s/veh	17.3			9.3	7.4	
Approach LOS	B			A	A	
Timer - Assigned Phs	2			4		6
Phs Duration (G+Y+Rc), s	37.5			22.5		37.5
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	33.0			18.0		33.0
Max Q Clear Time (g_c+l1), s	23.2			5.8		14.7
Green Ext Time (p_c), s	4.2			0.6		9.0
Intersection Summary						
HCM 6th Ctrl Delay			9.0			
HCM 6th LOS			A			

Queues
11: Powhaton Rd

2045 Total Conditions
PM Peak























											
Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	22	43	246	120	33	2403	100	34	3252	54	
v/c Ratio	0.06	0.12	0.77	0.35	0.26	0.74	0.10	0.27	1.00	0.05	
Control Delay	43.3	10.2	66.1	24.3	10.2	16.9	3.7	10.0	36.6	2.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	43.3	10.2	66.1	24.3	10.2	16.9	3.7	10.0	36.6	2.4	
Queue Length 50th (ft)	15	0	198	38	7	463	10	7	920	1	
Queue Length 95th (ft)	40	28	#321	97	16	519	30	16	#1113	15	
Internal Link Dist (ft)						1008					2609
Turn Bay Length (ft)						150	150	200			150
Base Capacity (vph)	347	350	321	341	125	3233	983	128	3268	1064	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.06	0.12	0.77	0.35	0.26	0.74	0.10	0.27	1.00	0.05	

Intersection Summary

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






HCM 6th Signalized Intersection Summary 11: Powhaton Rd

2045 Total Conditions
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	40	226	0	110	30	2211	92	31	2992	50
Future Volume (veh/h)	20	0	40	226	0	110	30	2211	92	31	2992	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1752	1870	1752	1870	1826	1752	1752	1826	1870
Adj Flow Rate, veh/h	22	0	43	246	0	120	33	2403	100	34	3252	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	10	2	10	2	5	10	10	5	2
Cap, veh/h	221	0	311	277	0	311	125	3263	972	172	3298	1049
Arrive On Green	0.20	0.00	0.20	0.20	0.00	0.20	0.04	0.65	0.65	0.05	0.66	0.66
Sat Flow, veh/h	1272	0	1585	1277	0	1585	1781	4985	1485	1668	4985	1585
Grp Volume(v), veh/h	22	0	43	246	0	120	33	2403	100	34	3252	54
Grp Sat Flow(s),veh/h/ln	1272	0	1585	1277	0	1585	1781	1662	1485	1668	1662	1585
Q Serve(g_s), s	2.0	0.0	2.9	22.6	0.0	8.6	0.8	41.8	3.2	0.8	82.6	1.6
Cycle Q Clear(g_c), s	10.5	0.0	2.9	25.5	0.0	8.6	0.8	41.8	3.2	0.8	82.6	1.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	221	0	311	277	0	311	125	3263	972	172	3298	1049
V/C Ratio(X)	0.10	0.00	0.14	0.89	0.00	0.39	0.26	0.74	0.10	0.20	0.99	0.05
Avail Cap(c_a), veh/h	221	0	311	277	0	311	125	3263	972	172	3298	1049
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.0	0.0	43.2	54.8	0.0	45.4	34.0	15.0	8.3	15.3	21.4	7.7
Incr Delay (d2), s/veh	0.9	0.0	0.9	31.5	0.0	3.6	5.0	1.5	0.2	2.6	12.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.2	10.6	0.0	3.7	0.8	14.2	1.0	0.5	30.9	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.9	0.0	44.1	86.3	0.0	49.0	39.1	16.5	8.5	17.8	34.2	7.8
LnGrp LOS	D	A	D	F	A	D	D	B	A	B	C	A
Approach Vol, veh/h	65			366			2536			3340		
Approach Delay, s/veh	46.4			74.1			16.5			33.6		
Approach LOS	D			E			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.4	89.6		30.0	9.5	90.5		30.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.9	85.1		25.5	5.0	86.0		25.5				
Max Q Clear Time (g_c+I1), s	2.8	43.8		12.5	2.8	84.6		27.5				
Green Ext Time (p_c), s	0.0	28.8		0.2	0.0	1.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				29.2								
HCM 6th LOS				C								

HCM 6th TWSC
12: Monaghan Rd & Creek Ave

2045 Total Conditions
PM Peak

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	46	32	792	1306	33
Future Vol, veh/h	0	46	32	792	1306	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	5	5	10
Mvmt Flow	0	50	35	861	1420	36
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	710	1456	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	4.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.4	2.3	-	-	-
Pot Cap-1 Maneuver	0	358	422	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	358	422	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.7	0.6		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	422	-	358	-	-	
HCM Lane V/C Ratio	0.082	-	0.14	-	-	
HCM Control Delay (s)	14.3	-	16.7	-	-	
HCM Lane LOS	B	-	C	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-	

Lanes, Volumes, Timings

2045 Total

13:

PM Peak Hour

	→	↘	↙	↗		
Lane Group	EBT	EBR2	NWL	NWT	Ø3	Ø4
Lane Configurations	↑↑	↑	↘	↑↑		
Traffic Volume (vph)	847	350	617	1113		
Future Volume (vph)	847	350	617	1113		
Ideal Flow (vphpl)	1900	1900	1900	1900		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	3539	1583	1770	3539		
Flt Permitted			0.950			
Satd. Flow (perm)	3539	1583	1770	3539		
Right Turn on Red		Yes				
Satd. Flow (RTOR)		380				
Link Speed (mph)	30			30		
Link Distance (ft)	322			317		
Travel Time (s)	7.3			7.2		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	921	380	671	1210		
Shared Lane Traffic (%)						
Lane Group Flow (vph)	921	380	671	1210		
Turn Type	NA	Perm	Perm	NA		
Protected Phases	2			4 3	3	4
Permitted Phases		2	4 3			
Total Split (s)	29.0	29.0			6.0	35.0
Total Lost Time (s)	4.0	4.0				
Act Effect Green (s)	26.4	26.4	35.6	35.6		
Actuated g/C Ratio	0.38	0.38	0.51	0.51		
v/c Ratio	0.69	0.46	0.75	0.67		
Control Delay	22.2	4.0	19.5	15.3		
Queue Delay	0.0	0.0	0.2	0.0		
Total Delay	22.2	4.0	19.6	15.3		
LOS	C	A	B	B		
Approach Delay	16.9			16.8		
Approach LOS	B			B		

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 40 (57%), Referenced to phase 2:EBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 16.9

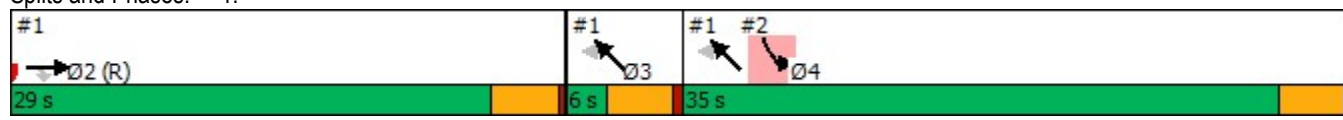
Intersection LOS: B

Intersection Capacity Utilization 64.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1:














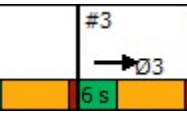



Lanes, Volumes, Timings

2045 Total










14:

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑									↑↑	
Traffic Volume (vph)	0	1037	0	0	0	0	0	0	0	0	1230	0
Future Volume (vph)	0	1037	0	0	0	0	0	0	0	0	1230	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	3539	0	0	0	0	0	0	0	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	3539	0	0	0	0	0	0	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes	Yes		
Satd. Flow (RTOR)												
Link Speed (mph)	30				30			30			30	
Link Distance (ft)	187				321			181			334	
Travel Time (s)	4.3				7.3			4.1			7.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1127	0	0	0	0	0	0	0	0	1337	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1127	0	0	0	0	0	0	0	0	1337	0
Turn Type	NA										NA	
Protected Phases	4 3										2	
Permitted Phases												
Total Split (s)											43.0	
Total Lost Time (s)											4.0	
Act Effct Green (s)	24.4										37.6	
Actuated g/C Ratio	0.35										0.54	
v/c Ratio	0.91										0.70	
Control Delay	37.6										14.3	
Queue Delay	0.0										0.0	
Total Delay	37.6										14.3	
LOS	D										B	
Approach Delay	37.6										14.3	
Approach LOS	D										B	
Intersection Summary												
Area Type: Other												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 0 (0%), Referenced to phase 2:SWT, Start of Green, Master Intersection												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.91												
Intersection Signal Delay: 24.9 Intersection LOS: C												
Intersection Capacity Utilization 69.3% ICU Level of Service C												
Analysis Period (min) 15												
Splits and Phases: 3:												
												






















Queues
15: 26th Ave





2045 Total Conditions
PM Peak

									
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	5	683	964	533	973	245	337	596	157
v/c Ratio	0.02	0.60	0.86	0.71	0.75	0.34	0.62	0.55	0.26
Control Delay	7.2	19.5	16.5	14.8	16.6	3.4	23.4	19.2	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	19.5	16.5	14.8	16.6	3.4	23.4	19.2	4.5
Queue Length 50th (ft)	1	106	179	52	104	4	102	92	0
Queue Length 95th (ft)	5	155	#513	m93	162	m20	178	136	34
Internal Link Dist (ft)		309			1460			166	
Turn Bay Length (ft)				200		200			
Base Capacity (vph)	264	1134	1122	755	1289	729	544	1088	594
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.60	0.86	0.71	0.75	0.34	0.62	0.55	0.26
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

HCM 6th Signalized Intersection Summary 15: 26th Ave

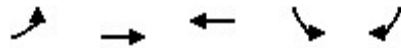
2045 Total Conditions
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	628	887	490	895	225	310	548	144	0	0	0
Future Volume (veh/h)	5	628	887	490	895	225	310	548	144	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826			
Adj Flow Rate, veh/h	5	683	964	533	973	245	337	596	157			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5			
Cap, veh/h	324	1145	1001	768	1301	580	551	1099	490			
Arrive On Green	0.08	0.33	0.33	0.13	0.38	0.38	0.32	0.32	0.32			
Sat Flow, veh/h	1739	3469	1547	3374	3469	1547	1739	3469	1547			
Grp Volume(v), veh/h	5	683	964	533	973	245	337	596	157			
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1687	1735	1547	1739	1735	1547			
Q Serve(g_s), s	0.1	9.9	19.8	6.1	14.6	7.1	9.9	8.5	4.6			
Cycle Q Clear(g_c), s	0.1	9.9	19.8	6.1	14.6	7.1	9.9	8.5	4.6			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	324	1145	1001	768	1301	580	551	1099	490			
V/C Ratio(X)	0.02	0.60	0.96	0.69	0.75	0.42	0.61	0.54	0.32			
Avail Cap(c_a), veh/h	324	1145	1001	768	1301	580	551	1099	490			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	11.6	16.8	9.9	12.8	16.3	13.9	17.4	16.9	15.6			
Incr Delay (d2), s/veh	0.1	2.3	20.9	5.1	4.0	2.2	5.0	1.9	1.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	3.6	11.7	2.2	5.4	2.4	4.0	3.1	1.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.6	19.1	30.8	17.9	20.3	16.2	22.4	18.8	17.3			
LnGrp LOS	B	B	C	B	C	B	C	B	B			
Approach Vol, veh/h	1652			1751			1090					
Approach Delay, s/veh	25.9			19.0			19.7					
Approach LOS	C			B			B					
Timer - Assigned Phs	2		3	4		7		8				
Phs Duration (G+Y+Rc), s	23.5		12.2	24.3		9.5		27.0				
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s	19.0		7.7	19.8		5.0		22.5				
Max Q Clear Time (g_c+I1), s	11.9		8.1	21.8		2.1		16.6				
Green Ext Time (p_c), s	3.1		0.0	0.0		0.0		3.4				
Intersection Summary												
HCM 6th Ctrl Delay	21.7											
HCM 6th LOS	C											

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	753	1476	8	0	134
Future Vol, veh/h	30	753	1476	8	0	134
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	5	5	10	10	10
Mvmt Flow	33	818	1604	9	0	146
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1613	0	-	0	-	807
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.3	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.3	-	-	-	-	3.4
Pot Cap-1 Maneuver	365	-	-	-	0	308
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	365	-	-	-	-	308
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.6	0		26.7		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	365	-	-	-	308	
HCM Lane V/C Ratio	0.089	-	-	-	0.473	
HCM Control Delay (s)	15.8	-	-	-	26.7	
HCM Lane LOS	C	-	-	-	D	
HCM 95th %tile Q(veh)	0.3	-	-	-	2.4	

Queues
17: 26th Ave & N-S Collector

2045 Total Conditions
PM Peak



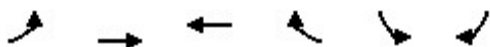
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	120	688	965	97	677
v/c Ratio	0.43	0.36	0.75	0.20	0.54
Control Delay	22.9	10.8	20.5	17.0	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	10.8	20.5	17.0	11.9
Queue Length 50th (ft)	33	61	153	26	81
Queue Length 95th (ft)	m68	118	218	57	128
Internal Link Dist (ft)		1009	2543	2452	
Turn Bay Length (ft)					200
Base Capacity (vph)	276	1890	1292	492	1257
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.36	0.75	0.20	0.54

Intersection Summary

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

HCM 6th Signalized Intersection Summary
17: 26th Ave & N-S Collector













2045 Total Conditions
PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	633	871	17	89	623
Future Volume (veh/h)	110	633	871	17	89	623
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1752	1826	1826	1752	1752	1752
Adj Flow Rate, veh/h	120	688	947	18	97	677
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	5	5	10	10	10
Cap, veh/h	362	1908	1312	25	501	1041
Arrive On Green	0.20	1.00	0.38	0.38	0.30	0.30
Sat Flow, veh/h	1668	3561	3574	66	1668	2613
Grp Volume(v), veh/h	120	688	472	493	97	677
Grp Sat Flow(s),veh/h/ln	1668	1735	1735	1814	1668	1306
Q Serve(g_s), s	2.2	0.0	14.0	14.0	2.6	12.6
Cycle Q Clear(g_c), s	2.2	0.0	14.0	14.0	2.6	12.6
Prop In Lane	1.00			0.04	1.00	1.00
Lane Grp Cap(c), veh/h	362	1908	653	683	501	1041
V/C Ratio(X)	0.33	0.36	0.72	0.72	0.19	0.65
Avail Cap(c_a), veh/h	362	1908	653	683	501	1041
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.3	0.0	16.0	16.0	15.6	14.7
Incr Delay (d2), s/veh	2.4	0.5	6.8	6.5	0.9	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.1	5.6	5.8	1.0	9.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.7	0.5	22.8	22.5	16.5	17.8
LnGrp LOS	B	A	C	C	B	B
Approach Vol, veh/h		808	965		774	
Approach Delay, s/veh		2.2	22.7		17.6	
Approach LOS		A	C		B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		37.5		22.5	10.4	27.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	5.9	22.6
Max Q Clear Time (g_c+l1), s		2.0		14.6	4.2	16.0
Green Ext Time (p_c), s		4.7		1.2	0.0	3.0
Intersection Summary						
HCM 6th Ctrl Delay			14.6			
HCM 6th LOS			B			

Queues
18: Monaghan Rd & 26th Ave

2045 Total Conditions
PM Peak

























												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	262	186	322	43	253	145	140	385	109	199	757	491
v/c Ratio	0.89	0.23	0.52	0.28	0.31	0.24	0.72	0.45	0.18	0.91	0.88	0.66
Control Delay	64.0	20.5	5.9	32.8	21.3	0.9	52.8	22.1	0.6	67.3	37.3	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	20.5	5.9	32.8	21.3	0.9	52.8	22.1	0.6	67.3	37.3	7.1
Queue Length 50th (ft)	54	31	0	16	43	0	28	66	0	64	151	0
Queue Length 95th (ft)	#116	55	51	44	72	0	#69	104	0	#177	#247	69
Internal Link Dist (ft)	2543			565			435			2472		
Turn Bay Length (ft)	350		350	350		350	350		350	350		350
Base Capacity (vph)	293	807	614	151	807	601	195	858	619	219	858	746
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.23	0.52	0.28	0.31	0.24	0.72	0.45	0.18	0.91	0.88	0.66

Intersection Summary

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

HCM 6th Signalized Intersection Summary 18: Monaghan Rd & 26th Ave

2045 Total Conditions
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	241	171	296	40	233	133	129	354	100	183	696	452
Future Volume (veh/h)	241	171	296	40	233	133	129	354	100	183	696	452
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	262	186	322	43	253	145	140	385	109	199	757	491
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	290	795	355	149	845	377	193	894	399	227	845	377
Arrive On Green	0.09	0.24	0.24	0.09	0.25	0.25	0.06	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	3237	3328	1485	1668	3328	1485	3237	3328	1485	1668	3328	1485
Grp Volume(v), veh/h	262	186	322	43	253	145	140	385	109	199	757	491
Grp Sat Flow(s),veh/h/ln	1618	1664	1485	1668	1664	1485	1618	1664	1485	1668	1664	1485
Q Serve(g_s), s	5.4	3.0	14.1	1.6	4.1	5.4	2.8	6.4	2.5	4.0	14.7	11.2
Cycle Q Clear(g_c), s	5.4	3.0	14.1	1.6	4.1	5.4	2.8	6.4	2.5	4.0	14.7	11.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	290	795	355	149	845	377	193	894	399	227	845	377
V/C Ratio(X)	0.90	0.23	0.91	0.29	0.30	0.38	0.72	0.43	0.27	0.88	0.90	1.30
Avail Cap(c_a), veh/h	290	795	355	149	845	377	193	894	399	227	845	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	20.6	24.8	28.5	20.2	20.7	31.0	20.3	7.7	27.4	24.1	10.9
Incr Delay (d2), s/veh	33.1	0.7	29.4	4.8	0.9	3.0	21.0	1.5	1.7	34.6	14.1	154.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	1.1	7.2	0.8	1.5	2.0	1.6	2.4	1.3	3.3	6.7	19.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	21.2	54.2	33.3	21.1	23.6	51.9	21.8	9.4	62.0	38.3	165.6
LnGrp LOS	E	C	D	C	C	C	D	C	A	E	D	F
Approach Vol, veh/h	770		441				634		1447			
Approach Delay, s/veh	49.3		23.1				26.3		84.7			
Approach LOS	D		C				C		F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	24.0	12.0	22.0	10.0	23.0	11.0	23.0				
Change Period (Y+Rc), s	5.0	6.0	6.0	* 6	6.0	* 6	5.0	6.0				
Max Green Setting (Gmax), s	4.0	17.0	6.0	* 16	4.0	* 17	6.0	16.0				
Max Q Clear Time (g_c+I1), s	6.0	8.4	3.6	16.1	4.8	16.7	7.4	7.4				
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	0.2	0.0	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			56.9									
HCM 6th LOS			E									
Notes												









HCM 6th AWSC
19: N-S Collector & E-W Road

2045 Total Conditions
PM Peak

Intersection

Intersection Delay, s/veh 29.3

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	62	20	97	154	2	100	389	26	8	317	52
Future Vol, veh/h	37	62	20	97	154	2	100	389	26	8	317	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	40	67	22	105	167	2	109	423	28	9	345	57
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	13.2	15.2	37.1	33.2
HCM LOS	B	C	E	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	94%	0%	76%	0%	99%	0%	86%
Vol Right, %	0%	6%	0%	24%	0%	1%	0%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	100	415	37	82	97	156	8	369
LT Vol	100	0	37	0	97	0	8	0
Through Vol	0	389	0	62	0	154	0	317
RT Vol	0	26	0	20	0	2	0	52
Lane Flow Rate	109	451	40	89	105	170	9	401
Geometry Grp	5	5	5	5	5	5	5	5
Degree of Util (X)	0.23	0.884	0.101	0.207	0.252	0.38	0.019	0.805
Departure Headway (Hd)	7.612	7.055	9.075	8.379	8.597	8.072	7.837	7.223
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	471	514	394	427	418	444	456	501
Service Time	5.368	4.811	6.851	6.155	6.361	5.836	5.595	4.981
HCM Lane V/C Ratio	0.231	0.877	0.102	0.208	0.251	0.383	0.02	0.8
HCM Control Delay	12.6	43	12.9	13.3	14.3	15.7	10.7	33.7
HCM Lane LOS	B	E	B	B	B	C	B	D
HCM 95th-tile Q	0.9	9.8	0.3	0.8	1	1.7	0.1	7.6

Intersection

Int Delay, s/veh 1.6

Movement EBL EBR NBL NBT SBT SBRLane Configurations 

Traffic Vol, veh/h 44 36 5 146 364 91

Future Vol, veh/h 44 36 5 146 364 91

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - 200 - - 200

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 92 92 92 92 92 92

Heavy Vehicles, % 10 10 10 10 10 10

Mvmt Flow 48 39 5 159 396 99

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 565 396 495 0 - 0

Stage 1 396 - - - - -

Stage 2 169 - - - - -

Critical Hdwy 6.5 6.3 4.2 - - -

Critical Hdwy Stg 1 5.5 - - - - -

Critical Hdwy Stg 2 5.5 - - - - -

Follow-up Hdwy 3.59 3.39 2.29 - - -

Pot Cap-1 Maneuver 473 636 1029 - - -

Stage 1 663 - - - - -

Stage 2 842 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 471 636 1029 - - -

Mov Cap-2 Maneuver 471 - - - - -

Stage 1 660 - - - - -

Stage 2 842 - - - - -

Approach EB NB SB

HCM Control Delay, s 13.1 0.3 0

HCM LOS B

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 1029 - 533 - -

HCM Lane V/C Ratio 0.005 - 0.163 - -






HCM Control Delay (s) 8.5 - 13.1 - -





HCM Lane LOS A - B - -

HCM 95th %tile Q(veh) 0 - 0.6 - -

HCM 6th TWSC
21: N-S Collector & Creek Ave

2045 Total Conditions
PM Peak

Intersection						
Int Delay, s/veh	5.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	182	11	135	11	11	389
Future Vol, veh/h	182	11	135	11	11	389
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	200	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	198	12	147	12	12	423
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	594	147	0	0	159	0
Stage 1	147	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Critical Hdwy	6.5	6.3	-	-	4.2	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	2.29	-
Pot Cap-1 Maneuver	455	879	-	-	1373	-
Stage 1	861	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	451	879	-	-	1373	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	861	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	19	0		0.2		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	464	1373	-	
HCM Lane V/C Ratio	-	-	0.452	0.009	-	
HCM Control Delay (s)	-	-	19	7.6	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	2.3	0	-	

Intersection												
Int Delay, s/veh	8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	46	3	28	11	25	5	5	76	82	5	116
Future Vol, veh/h	17	46	3	28	11	25	5	5	76	82	5	116
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	2	2	10	10	2	2	2	10	2	10
Mvmt Flow	18	50	3	30	12	27	5	5	83	89	5	126
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	39	0	0	53	0	0	239	187	52	218	175	26
Stage 1	-	-	-	-	-	-	88	88	-	86	86	-
Stage 2	-	-	-	-	-	-	151	99	-	132	89	-
Critical Hdwy	4.2	-	-	4.12	-	-	7.12	6.52	6.22	7.2	6.52	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.2	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.2	5.52	-
Follow-up Hdwy	2.29	-	-	2.218	-	-	3.518	4.018	3.318	3.59	4.018	3.39
Pot Cap-1 Maneuver	1521	-	-	1553	-	-	715	708	1016	721	718	1027
Stage 1	-	-	-	-	-	-	920	822	-	902	824	-
Stage 2	-	-	-	-	-	-	851	813	-	853	821	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1521	-	-	1553	-	-	608	685	1016	642	695	1027
Mov Cap-2 Maneuver	-	-	-	-	-	-	608	685	-	642	695	-
Stage 1	-	-	-	-	-	-	909	812	-	891	808	-
Stage 2	-	-	-	-	-	-	727	797	-	769	811	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.9			3.2			9.2			10.9		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	952	1521	-	-	1553	-	-	823				
HCM Lane V/C Ratio	0.098	0.012	-	-	0.02	-	-	0.262				
HCM Control Delay (s)	9.2	7.4	0	-	7.4	-	-	10.9				
HCM Lane LOS	A	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	1				