



LSC TRANSPORTATION CONSULTANTS, INC.

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August 31, 2023

Mr. James Spehalski  
Marathon Land Company  
9750 W. Cambridge Place  
Littleton, CO 80127

Re: Harmony Phase 6  
Aurora, CO  
LSC #220300

Dear Mr. Spehalski:

In response to your request, LSC Transportation Consultants, Inc. has prepared this updated traffic impact analysis for the proposed Harmony Phase 6 development to address City comments. As shown on Figure 1, the site is located south of E. 6<sup>th</sup> Avenue and east of S. Powhaton Road in eastern Aurora, Colorado.

## **REPORT CONTENTS**

The report contains the following: the existing roadway and traffic conditions in the vicinity of the site including the lane geometries, traffic controls, posted speed limits, etc.; the existing weekday peak-hour traffic volumes; the existing daily traffic volumes in the area; the typical weekday site-generated traffic volume projections for the site; the assignment of the projected traffic volumes to the area roadways; the projected 2024 and 2040 background and resulting total traffic volumes on the area roadways; the site's projected traffic impacts; and any recommended roadway improvements to mitigate the site's traffic impacts.

## **RECENT TRAFFIC STUDIES**

LSC prepared an updated master traffic impact study (MTIS) for the entire Harmony Master Plan, dated March 31, 2023.

LSC has also prepared site-specific traffic reports for the ASP Harmony Ridge P-8 School, dated October 12, 2018, Harmony Phase 3, dated November 4, 2020, Harmony Phase 4, dated July 16, 2021, Harmony Phase 5, dated August 25, 2022 and Harmony Phase 9 dated August 5, 2022.

## **LAND USE AND ACCESS**

The site is proposed to include 663 residential dwelling units including a mix of single-family detached and attached dwelling units. Three full-movement access points are proposed to Trussville Street. A three-quarter movement (left-in/right-in/right-out-only) and a right-in/

right-out-only access are proposed to Powhatan Road. A three-quarter access is proposed to E. 6<sup>th</sup> Avenue. The proposed site plan is shown in Figure 2.

The currently proposed Phase 6 development was included in the Updated MTIS as Planning Areas 86, 87, 88, and 89. The currently proposed land use and access are consistent with the update currently being made to the MTIS.

## **VEHICLE AND PEDESTRIAN CONNECTIVITY**

Figure 2 shows all of the proposed sidewalks and trails within the proposed Harmony Phase 6. As shown in Figure 2, the proposed pedestrian system provides for access between the residential land uses and the existing Harmony Ridge P-8 School.

## **ROADWAY AND TRAFFIC CONDITIONS**

### **Area Roadways**

The major roadways in the site's vicinity are shown on Figure 1 and are described below.

- **S. Powhatan Road** is a north-south roadway west of the site. The posted speed limit is 45 mph in the vicinity of the site. S. Powhatan Road currently has two southbound through lanes from E. 6<sup>th</sup> Avenue to just south of E. Alameda Avenue and two northbound through lanes from just south of Alameda Avenue to just north of E. 1<sup>st</sup> Avenue/E. Ellsworth Avenue. A second northbound through lane will be added from just north of E. 1<sup>st</sup> Avenue/E. Ellsworth Avenue to E. 6<sup>th</sup> Avenue adjacent to the site with the currently proposed Harmony Phase 6.
- **Trussville Street** is north-south, two-lane collector roadway that currently extends from E. Alameda Avenue to E. 1<sup>st</sup> Avenue. Trussville Street will be extended south to E. Mississippi Avenue as part of Harmony Phases 4 and 5. Trussville Street will be extended north to E. 6<sup>th</sup> Avenue as part of the currently proposed Harmony Phase 6.
- **E. 6<sup>th</sup> Avenue:** The E. 6<sup>th</sup> Avenue alignment forms the north boundary of the Harmony Phase 6 development. The NEATS study shows the section adjacent to the site as a six-lane Major Arterial. A half section of E. 6<sup>th</sup> Avenue is planned to be constructed between Powhatan Road and Trussville Street as part of the currently proposed Harmony Phase 6.
- **E. Ellsworth Avenue** is a two-lane collector roadway that extends east from the intersection of 1<sup>st</sup> Avenue and S. Powhatan Road through the Harmony Master Plan area. E. Ellsworth Avenue is planned to be extended east to Monaghan Road as part of the Harmony development and further east to serve the Sky Ranch development.

### **Existing Traffic Conditions**

Figure 3 shows the existing traffic volumes, lane geometries, and traffic controls in the site's vicinity on a typical weekday. The weekday peak hour traffic volumes and the daily traffic volumes are based on the attached traffic counts conducted by Counter Measures in March, 2022 and June, 2022, respectively.

Note that the traffic counts were conducted prior to the recent widening project of S. Powhatan Road in the vicinity of the site which included the extension of E. 1<sup>st</sup> Avenue to S. Powhatan Road.

### **2024 and 2040 Background Traffic**

Figure 4a shows the estimated 2024 background traffic volumes and Figure 4b shows the 2024 background lane geometry and traffic control for the study area intersections. The 2024 background traffic volumes are based on a two percent annual growth rate for through traffic on S. Powhatan Road plus estimates of additional traffic projected to be generated with the extension of E. 1<sup>st</sup> Avenue to S. Powhatan Road, by buildout of Harmony Phases 1 through 5, and by buildout of Phase 1 of the Sky Ranch development located south of I-70 between S. Powhatan Road and Hayesmount Road. The 2024 background traffic volumes assume E. 6<sup>th</sup> Avenue has not been constructed east of Trussville Road and Monagahan Road has not been constructed north of E. Ellsworth Avenue.

Figure 5a shows the estimated 2040 background traffic volumes and Figure 5b shows the 2040 background lane geometry and traffic control for the study area. The 2040 background traffic volumes include trips estimated to be generated by build out of the future land uses within the Harmony Master Plan area except for those land uses within the currently proposed Phase 6. The 2040 background traffic volumes are based on 2040 total volumes shown in the recently updated Harmony MTIS.

### **Existing, 2024, and 2040 Background Levels of Service**

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from “A” to “F.” LOS A is indicative of little congestion or delay and LOS F is indicative of a high level of congestion or delay. Attached are specific level of service definitions for signalized and unsignalized intersections.

The intersections in Figures 3 through 5b were analyzed to determine the existing, 2024, and 2040 background levels of service using Synchro. Table 1 shows the level of service analysis results. The level of service reports are attached.

- 1. S. Powhatan Road/E. 6<sup>th</sup> Avenue:** All movements at this unsignalized intersection currently operate at LOS “B” or better during both morning and afternoon peak-hours. By 2024 the eastbound left-turn movement is projected to operate at LOS “F” during the morning and afternoon peak-hours if it remains stop-sign controlled. It is expected to operate at an overall LOS “D” during the peak hours through 2040 as a traffic signal controlled intersection.
- 2. E. 6<sup>th</sup> Avenue/N. Robertsdale Street:** This intersection was analyzed only in the total traffic scenarios.
- 3. E. 6<sup>th</sup> Avenue/Trussville Street:** This future signalized intersection was only analyzed for the 2040 background traffic scenario. It is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040.

7. **S. Powhatan Road/E. 3<sup>rd</sup> Avenue:** All movements at this stop-sign controlled intersection are expected to operate at LOS “C” or better during both peak-hours through 2040 assuming it is restricted to a three-quarter movement intersection (left-in/right-in/right-out only).
9. **S. Powhatan Road/E. 1<sup>st</sup> Avenue/Ellsworth Avenue:** All movements at this unsignalized intersection currently operate at LOS “B” or better during both morning and afternoon peak-hours. The eastbound and westbound approaches are expected to operate at LOS “F” during the peak-hours by 2024 if this intersection remains stop-sign controlled. By 2040 it was assumed that this intersection would be converted to traffic signal control. It is expected to operate at an overall LOS “B” during both morning and afternoon peak-hours through 2040.
10. **Trussville Street/E. Ellsworth Avenue:** This roundabout controlled intersection is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040.
33. **S. Powhatan Road/E. 4<sup>th</sup> Avenue:** This intersection was analyzed only in the total traffic scenarios.
34. **Trussville Street/E. 4<sup>th</sup> Place:** This intersection was analyzed only in the total traffic scenarios.
35. **Trussville Street/E. 3<sup>rd</sup> Avenue:** All movements at this stop-sign controlled intersection are expected to operate at LOS “A” through 2040.
37. **Trussville Street/E. 2<sup>nd</sup> Place:** All movements at this stop-sign controlled intersection are expected to operate at LOS “A” through 2040.
38. **N. Robertsdale/E. Ellsworth Avenue:** This roundabout controlled intersection is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040.

## TRIP GENERATION

Table 2 shows the estimated average weekday, morning peak-hour, and afternoon peak-hour trip generation for the proposed land use based on the rates from *Trip Generation, 11<sup>th</sup> Edition, 2021* by the Institute of Transportation Engineers (ITE).

The site is expected to generate about 5,473 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 108 vehicles would enter and about 286 vehicles would exit the site. During the afternoon peak-hour, which generally occurs for one hour between 4:00 and 6:00 p.m., about 316 vehicles would enter and about 197 vehicles would exit.

## **DIRECTIONAL DISTRIBUTION**

Figure 6 shows the estimated short-term and long-term directional distribution of site-generated traffic volumes on the area roadways. The estimates were based on the location of the site with respect to the regional population, employment, and activity centers; and the site's proposed land use. The short-term directional distribution estimate assumes E. 6<sup>th</sup> Avenue has not been constructed east of Trussville Road and Monaghan Road has not been constructed north of E. Ellsworth Avenue.

## **TRIP ASSIGNMENT**

Figures 7 and 8 show the estimated assignment of 2024 and 2040 site-generated traffic volumes, respectively. The site-generated traffic volumes are based on the external trip generation estimate (from Table 2) and the directional distribution shown in Figure 6. Internal trips between the proposed Harmony Phase 6 residential and the non-residential land uses within the overall Harmony Master Plan have been assigned separately based on the location of the school sites, community center, and future commercial areas. As shown in the Harmony MTIS about seven percent of the daily residential vehicle trips are expected to remain internal to the overall Harmony Master Plan area.

## **2024 AND 2040 TOTAL TRAFFIC**

Figure 9a shows the estimated 2024 total traffic volumes for the study area intersections. These volumes are the sum of the 2024 background traffic volumes (from Figure 4a) and the 2024 site-generated traffic volumes (from Figure 7). Figure 9b shows the recommended 2024 lane geometry and traffic control for the study area intersections.

Figure 10a shows the estimated 2040 total traffic volumes for the study area intersections. These volumes are the sum of the 2040 background traffic volumes (from Figure 5a) and the 2040 site-generated traffic volumes (from Figure 8). Figure 10b shows the recommended 2040 lane geometry and traffic control for the study area intersections.

## **PROJECTED LEVELS OF SERVICE**

The intersections in Figures 9a through 10b were analyzed to determine the 2024 and 2040 total levels of service. Table 1 level of service analysis results. The level of service reports are attached.

- 1. S. Powhaton Road/E. 6<sup>th</sup> Avenue:** This signalized intersection is expected to operate at an overall LOS "B" during the morning peak-hour and LOS "D" during the afternoon peak-hour through 2024. By 2040 both peak-hours are expected to operate at an overall LOS "D" during both peak-hours.
- 2. E. 6<sup>th</sup> Avenue/N. Robertsedale Street:** All movements at this stop-sign controlled intersection are expected to operate at LOS "B" or better during both morning and afternoon peak-hours through 2040.

3. **E. 6<sup>th</sup> Avenue/Trussville Street:** This future signalized intersection was only analyzed for the 2040 total traffic scenario. It is expected to operate at an overall LOS “B” during the morning peak-hour and LOS “A” during the afternoon peak-hour through 2040.
7. **S. Powhaton Road/E. 3<sup>rd</sup> Avenue:** All movements at this stop-sign controlled intersection are expected to operate at LOS “C” or better during both morning and afternoon peak-hours through 2040 assuming it is restricted to a three-quarter movement intersection (left-in/right-in/right-out only).
9. **S. Powhaton Road/E. 1<sup>st</sup> Avenue/Ellsworth Avenue:** This intersection is expected to be signalized by 2024 and operate at an overall LOS “B” during both morning and afternoon peak-hours through 2024 and LOS “C” or better through 2040.
10. **E. 6<sup>th</sup> Avenue/E. Ellsworth Avenue:** This roundabout controlled intersection is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040.
33. **S. Powhaton Road/E. 4<sup>th</sup> Avenue:** All movements at this stop-sign controlled intersection are expected to operate at LOS “C” or better during both morning and afternoon peak-hours through 2040.
34. **Trussville Street/E. 4<sup>th</sup> Place:** All movements at this stop-sign controlled intersection are expected to operate at LOS “A” during both morning and afternoon peak-hours through 2040.
35. **Trussville Street/E. 3<sup>rd</sup> Avenue:** All movements at this stop-sign controlled intersection are expected to operate at “B” or better during both morning and afternoon peak-hours through 2040.
37. **Trussville Street/E. 2<sup>nd</sup> Place:** All movements at this stop-sign controlled intersection are expected to operate at “B” or better both morning and afternoon peak-hours through 2040.
38. **N. Robertsdale/E. Ellsworth Avenue:** This roundabout controlled intersection is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040.

## 95<sup>TH</sup> PERCENTILE QUEUE LENGTHS AND RECOMMENDED TURN LANES

The estimated 2040 95<sup>th</sup> percentile queue lengths for the intersections in the study area are shown in Table 3. Table 3 also shows the recommended turn lane lengths based on the NR-B classification criteria in the *CDOT State Highway Access Code* and the projected 95<sup>th</sup> percentile queue lengths. The recommended turn lane lengths are rounded up to the nearest 25 feet per feedback from City staff.

The westbound queue on E. Ellsworth Avenue approaching S. Powhaton Road may block the first intersection to the east (N. Quantock Street) in the long-term. If this occurs regularly, the existing on-street parking may need to be removed to add eastbound and westbound left-turn lanes.

## TRAFFIC SIGNAL WARRANT ANALYSIS

Tables 4 through 6 show the projected traffic volumes compared to the traffic volume thresholds for Traffic Signal Warrant 1 (Eight-Hour), Warrant 2 (Four-Hour), and Warrant 3 (Peak-Hour) from the 2009 *Manual on Uniform Traffic Control Devices for Street and Highway* (MUTCD) at the following intersections:

- S. Powhatan Road/E. 6<sup>th</sup> Avenue (#1) - Table 4
- E. 6<sup>th</sup> Avenue/Trussville Street (#3) - Table 5
- S. Powhatan Road/E. 1<sup>st</sup> Avenue/E. Ellsworth Avenue (#9) - Table 6

The off-peak traffic volumes were based on the peak-hour volumes and 24-hour traffic counts conducted on S. Powhatan Road south of E. Alameda Avenue by Counter Measures in March, 2022.

The findings of Tables 4 through 6 are summarized in Table 7. As shown in Table 6, the intersections of S. Powhatan Road/E. 6<sup>th</sup> Avenue (#1) and S. Powhatan Road/E. 1<sup>st</sup> Avenue/ Ellsworth Avenue (#9) are expected to meet multiple traffic signal warrants based on the projected 2024 **background** traffic volumes. The intersection of E. 6<sup>th</sup> Avenue/Trussville Street (#3) will not likely meet traffic signal warrants until E. 6<sup>th</sup> Avenue is constructed east of Trussville Street. As shown in Table 6 it is projected to meet multiple traffic signal warrants based on the projected 2040 **background** traffic volumes.

## RECOMMENDED IMPROVEMENTS

Table 8 shows the recommended improvements by 2024 and 2040. The recommended turn lane lengths are based on the criteria contained in the *CDOT State Highway Access Code* for the NR-B classification, the projected total traffic volumes shown in Figures 9a and 10a, and the projected 95<sup>th</sup> percentile queue lengths shown in Table 3. A design speed of 45 mph was assumed for all Major and Minor Arterial roadways, a design speed of 35 mph was assumed for Collector roadways, and a design speed of 25 mph was assumed for all Local roadways. The recommended turn lane lengths are rounded up to the nearest 25 feet per feedback from City staff.

## CONCLUSIONS AND RECOMMENDATIONS

### Trip Generation

1. The site is expected to generate about 5,473 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. During the morning peak-hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 108 vehicles would enter and about 286 vehicles would exit the site. During the afternoon peak-hour, which generally occurs for one hour between 4:00 and 6:00 p.m., about 316 vehicles would enter and about 197 vehicles would exit.

### Projected Levels of Service

2. All of the signalized, stop-sign controlled and roundabout controlled intersections in the study area are expected to operate at LOS "D" or better during both morning and afternoon peak-hours through 2040 with the recommended improvements.

### Conclusions

3. The impact of the site can be accommodated by the existing and planned roadway network with the following recommended improvements.

### Recommendations

4. The recommended improvements for 2024 and 2040 are shown in Figures 9b and 10b and detailed in Tables 3 and 8.

\* \* \* \* \*

We trust our findings will assist you in gaining approval of the proposed Harmony Phase 6 development. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By

Christopher S. McGranahan, PE  
Principal/President

CSM/wc



8-31-23

Enclosures: Tables 1 - 8  
Figures 1 - 10b  
Traffic Counts  
Level of Service Definitions  
Level of Service Reports  
Queuing Reports



Table 1 (Page 1 of 2)  
Intersection Levels of Service Analysis  
Harmony Phase 6  
Aurora, Colorado  
LSC #220300; August, 2023

Intersection No. & Location	Traffic Control	Existing Traffic				2024 Background Traffic				2024 Total Traffic				2040 Background Traffic				2040 Total Traffic			
		Level of Service AM	Move-ment Delay	Level of Service PM	Move-ment Delay	Level of Service AM	Move-ment Delay	Level of Service PM	Move-ment Delay	Level of Service AM	Move-ment Delay	Level of Service PM	Move-ment Delay	Level of Service AM	Move-ment Delay	Level of Service PM	Move-ment Delay	Level of Service AM	Move-ment Delay	Level of Service PM	Move-ment Delay
1) <u>S. Powhaton Road/E. 6th Avenue</u>	TWSC	A	7.7	A	7.8	A	8.8	B	10.9	--	--	--	--	--	--	--	--	--	--	--	--
NB Left		A	7.7	A	7.8	A	8.8	B	10.9	--	--	--	--	--	--	--	--	--	--	--	--
EB Left		B	11.5	B	12.7	F	88.4	F	>240	--	--	--	--	--	--	--	--	--	--	--	--
EB Right		A	9.2	A	9.6	B	11.1	C	23.8	--	--	--	--	--	--	--	--	--	--	--	--
	Signalized	--	--	--	--	D	49.0	D	45.1	B	15.9	C	34.1	E	79.2	D	51.5	E	79.5	D	48.3
EB Left		--	--	--	--	--	--	--	--	B	14.0	C	29.6	D	39.7	D	47.8	D	39.5	D	47.5
EB Through		--	--	--	--	--	--	--	--	B	16.3	E	60.1	A	0.0	A	0.0	A	0.0	A	0.0
EB Right		--	--	--	--	D	52.1	D	52.0	B	15.9	D	46.2	D	52.0	D	48.4	D	51.7	D	47.7
EB Approach & Delay		--	--	--	--	D	50.6	D	48.7	B	14.1	C	32.2	D	36.1	D	40.2	D	35.8	D	38.3
WB Left		--	--	--	--	--	--	--	--	B	14.4	C	33.3	D	47.2	D	48.1	D	47.1	D	40.2
WB Through/Right or Through		--	--	--	--	--	--	--	--	--	--	--	--	D	41.2	D	45.7	D	41.0	D	38.3
WB Right		--	--	--	--	--	--	--	--	B	14.4	C	33.2	D	45.8	D	46.8	D	45.7	D	39.7
WB Approach & Delay		--	--	--	--	--	--	--	--	B	14.4	C	33.2	D	45.8	D	46.8	D	45.7	D	39.7
NB Left		--	--	--	--	A	3.8	B	14.8	A	7.8	E	71.8	E	62.1	E	65.3	E	63.8	E	67.4
NB Through		--	--	--	--	A	3.4	A	5.4	B	10.1	B	12.6	B	18.6	B	16.4	B	19.2	B	17.6
NB Right		--	--	--	--	--	--	--	--	A	6.0	A	9.2	B	15.1	B	14.2	B	15.5	B	15.2
NB Approach & Delay		--	--	--	--	A	3.5	A	8.1	A	9.3	C	30.8	C	30.4	C	29.6	C	31.7	C	31.4
SB Left		--	--	--	--	--	--	--	--	A	8.9	B	10.2	B	18.3	B	14.2	B	19.1	B	15.8
SB Through/Right or Through		--	--	--	--	A	6.3	B	17.4	B	12.9	D	50.6	C	24.7	C	28.2	C	25.9	C	30.6
SB Right		--	--	--	--	--	--	--	--	--	--	--	--	C	22.3	B	19.6	C	23.3	C	20.7
SB Approach & Delay		--	--	--	--	A	6.3	B	17.4	B	12.8	D	48.6	C	23.7	C	26.2	C	24.8	C	28.2
Entire Intersection Delay (sec /veh)		--	--	--	--	11.4		21.4		11.4		41.9		35.8		35.1		36.5		35.1	
Entire Intersection LOS		--	--	--	--	B		C		B		D		D		D		D		D	
2) <u>E. 6th Avenue/N. Robertsdale St</u>	TWSC	--	--	--	--	--	--	--	--	A	8.4	A	8.8	--	--	--	--	A	9.8	B	10.4
NB Right	Three-Quarter	--	--	--	--	--	--	--	--	A	7.3	A	7.5	--	--	--	--	A	8.7	A	9.3
WB Left		--	--	--	--	--	--	--	--	A	7.3	A	7.5	--	--	--	--	A	8.7	A	9.3
3) <u>E. 6th Avenue/Trussville Street</u>	Signalized	--	--	--	--	--	--	--	--	--	--	--	--	A	3.8	A	3.4	A	3.8	A	3.5
EB Left		--	--	--	--	--	--	--	--	--	--	--	--	A	0.2	A	0.3	A	0.3	A	0.2
EB Through/Right		--	--	--	--	--	--	--	--	--	--	--	--	A	0.5	A	0.9	A	0.5	A	0.9
EB Approach & Delay		--	--	--	--	--	--	--	--	--	--	--	--	A	0.4	A	0.1	A	0.4	A	0.3
WB Left		--	--	--	--	--	--	--	--	--	--	--	--	A	0.4	A	0.3	A	0.5	A	0.5
WB Through/Right		--	--	--	--	--	--	--	--	--	--	--	--	A	0.4	A	0.3	A	0.5	A	0.5
WB Approach & Delay		--	--	--	--	--	--	--	--	--	--	--	--	A	0.4	A	0.3	A	0.5	A	0.5
NB Left		--	--	--	--	--	--	--	--	--	--	--	--	D	47.4	D	51.9	D	48.5	D	52.8
NB Through/Right		--	--	--	--	--	--	--	--	--	--	--	--	D	47.6	D	51.7	D	49.2	D	53.6
NB Approach & Delay		--	--	--	--	--	--	--	--	--	--	--	--	D	47.6	D	51.8	D	49.0	D	53.3
SB Left		--	--	--	--	--	--	--	--	--	--	--	--	D	51.5	D	54.9	D	54.0	E	57.1
SB Through		--	--	--	--	--	--	--	--	--	--	--	--	D	46.3	D	50.5	D	46.3	D	50.2
SB Right		--	--	--	--	--	--	--	--	--	--	--	--	E	61.6	E	62.3	E	61.6	E	61.0
SB Approach & Delay		--	--	--	--	--	--	--	--	--	--	--	--	E	58.3	E	58.7	E	59.0	E	58.4
Entire Intersection Delay (sec /veh)		--	--	--	--	--	--	--	--	--	--	--	--	9.9		8.4		10.8		8.9	
Entire Intersection LOS		--	--	--	--	--	--	--	--	--	--	--	--	A		A		B		A	
7) <u>S. Powhaton Road/E. 3rd Avenue</u>	TWSC	--	--	--	--	A	8.1	A	9.7	A	8.1	A	9.8	B	10.1	C	17.5	B	10.1	C	17.5
NB Left	Three-Quarter	--	--	--	--	A	8.1	A	9.7	A	8.1	A	9.8	B	10.1	C	17.5	B	10.1	C	17.5
EB Right		--	--	--	--	A	9.5	B	11.4	A	9.5	B	11.4	B	12.0	C	19.4	B	12.0	C	19.4
WB Right		--	--	--	--	--	--	--	--	B	11.5	B	10.9	--	--	--	--	C	16.3	B	13.5
SB Left		--	--	--	--	--	--	--	--	A	9.4	A	9.5	--	--	--	--	B	13.5	B	11.9



**Table 2**  
**Trip Generation Estimate**  
**Harmony Phase 6**  
**Aurora, CO**  
**LSC #220300; August, 2023**

Harmony Master Plan Planning Area		Land Use Description	Trip Generation Units	Trip Generation Rates <sup>(1)</sup>				Total Trips Generated					
				Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
					In	Out	In	Out		In	Out	In	Out
86	Single Family Detached Housing <sup>(2)</sup>	81 DU <sup>(3)</sup>	9.43	0.182	0.518	0.592	0.348	764	15	42	48	28	
	Single Family Attached Housing <sup>(4)</sup>	53 DU	7.20	0.149	0.331	0.325	0.245	382	8	18	17	13	
87	Single Family Detached Housing	55 DU	9.43	0.182	0.518	0.592	0.348	519	10	28	33	19	
	Single Family Attached Housing	122 DU	7.20	0.149	0.331	0.325	0.245	878	18	40	40	30	
88	Single Family Detached Housing	155 DU	9.43	0.182	0.518	0.592	0.348	1,462	28	80	92	54	
89	Single Family Detached Housing	119 DU	9.43	0.182	0.518	0.592	0.348	1,122	22	62	70	41	
	Single Family Attached Housing	48 DU	7.20	0.149	0.331	0.325	0.245	346	7	16	16	12	
		633 DU		Total Trips				5,473	108	286	316	197	

**Notes:**

(1) Source: *Trip Generation*, Institute of Transportation Engineers, 11th Edition, 2021.

(2) ITE Land Use No. 210 - Single-Family Detached Housing

(3) DU = dwelling unit

(4) ITE Land Use No. 215 - Single-Family Attached Housing

**Table 3 (Page 1 of 2)**  
**95th Percentile Queue Lengths**  
**Harmony Phase 6**  
**Aurora, Colorado**  
**LSC #220300; August, 2023**

Intersection No. & Location	2040	Turn Lane Lengths Proposed <sup>(1)</sup> (feet)	95th Percentile Queue Length		95th Percentile Queue Length	
	Assumed Posted Speed Limit (mph)		2024 Total		2040 Total	
			AM Peak (feet)	PM Peak (feet)	AM Peak (feet)	PM Peak (feet)
1) <u>S. Powhatan Road/E. 6th Avenue</u>						
EB Left	45	275	81	204	209	153
EB Through	45	---	26	76	120	249
EB Right	45	275	39	65	0	0
WB Left	45	275	4	4	46	86
WB Through/Right Or Through	45	---	35	38	145	142
WB Right	45	275	---	---	3	13
NB Left	45	2 @275	74	238	m230	194
NB Through	45	---	290	282	m446	347
NB Right	45	275	0	0	m74	m89
SB Left	45	275	7	23	55	77
SB Through	45	---	168	762	281	659
SB Right	45	275	---	---	46	57
2) <u>E. 6th Avenue/PA-86/PA-87</u>						
WB Left	45	275	<25	<25	<25	<25
NB Right	25	---	<25	<25	<25	<25
3) <u>E. 6th Avenue/Trussville Street</u>						
EB Left	45	275	---	---	14	98
EB Through/Right	45	---	---	---	64	57
WB Left	45	275	---	---	37	21
WB Through/Right	45	---	---	---	169	59
NB Left	35	200	---	---	63	59
NB Through/Right	35	---	---	---	61	58
SB Left	35	200	---	---	88	69
SB Through	35	---	---	---	26	56
SB Right	35	200	---	---	65	57
7) <u>S. Powhatan Road/E. 3rd Avenue</u>						
EB Right	25	---	<25	<25	<25	<25
WB Right	25	---	<25	<25	<25	<25
NB Left	45	275	<25	<25	<25	<25
NB Right	45	275	<25	<25	<25	<25
SB Left	45	275	<25	<25	<25	<25
9) <u>S. Powhatan Road/E. 1st Avenue/Ellsworth Avenue</u>						
EB Approach	35	---	65	43	110	66
WB Approach	35	---	248	135	650 <sup>(2)</sup>	308
NB Left	45	275	8	19	m7	m26
NB Through	45	---	104	121	m325	334
NB Right	45	275	0	24	m37	75
SB Left	45	275	51	104	140	m272
SB Through/Right	45	---	61	132	410	864

**Notes:**

- (1) Auxiliary turn lane lengths on arterial roadways are based on 45 mph and the NR-B classification in the CDOT State Highway Access Code and the 95th percentile queue length.  
Collectors are based on 35 mph and Local Street on 25 mph  
A redirect taper of 45:1 is appropriate for 45 mph and 20:1 for 35 mph.  
The lengths shown are consistent with the Recommended Improvements shown in Table 8.
- (2) If the westbound queue on E. Ellsworth Avenue regularly blocks the first intersection to the east (N. Quantock Street) the existing on-street parking may need to be removed to add eastbound and westbound left-turn lanes

**Table 3 (Page 2 of 2)**  
**95th Percentile Queue Lengths**  
**Harmony Phase 6**  
**Aurora, Colorado**  
**LSC #220300; August, 2023**

Intersection No. & Location	2040	Turn Lane Lengths Proposed <sup>(1)</sup> (feet)	95th Percentile Queue Length		95th Percentile Queue Length	
	Assumed Posted Speed Limit (mph)		2024 Total		2040 Total	
			AM Peak (feet)	PM Peak (feet)	AM Peak (feet)	PM Peak (feet)
10) <u>Trussville Street/E. Ellsworth Avenue - Roundabout</u>						
EB Approach	35	---	<25	25	25	50
WB Approach	35	---	<25	<25	50	25
NB Approach	35	---	<25	<25	25	25
SB Approach	35	---	<25	<25	25	<25
33) <u>S. Powhatan Road/RIRO Access</u>						
WB Right	25	---	<25	<25	<25	<25
NB Right	45	275	<25	<25	<25	<25
34) <u>Trussville Street/4th Place</u>						
NB Left	35	200	<25	<25	<25	<25
EB Approach	25	---	<25	<25	<25	<25
35) <u>Trussville Street/E. 3rd Avenue</u>						
NB Left	35	200	<25	<25	<25	<25
EB Approach	25	---	<25	<25	<25	<25
WB Approach	25	---	---	---	<25	<25
SB Left	35	200	---	---	<25	<25
37) <u>Trussville Street/E. 2nd Place</u>						
NB Left	35	200	<25	<25	<25	<25
EB Approach	25	---	<25	<25	<25	<25
WB Approach	25	---	---	---	<25	<25
SB Left	35	200	---	---	<25	<25
38) <u>E. Ellsworth Avenue/N. Robertsdale Street - Roundabout</u>						
EB Approach	35	---	<25	25	25	50
WB Approach	35	---	25	<25	50	25
NB Approach	25	---	<25	<25	<25	<25
SB Approach	25	---	<25	<25	<25	<25

**Notes:**

- (1) Auxiliary turn lane lengths on arterial roadways are based on 45 mph and the NR-B classification in the *CDOT State Highway Access Code* and the 95th percentile queue length.  
Collectors are based on 35 mph and Local Street on 25 mph  
A redirect taper of 45:1 is appropriate for 45 mph and 20:1 for 35 mph.  
The lengths shown are consistent with the Recommended Improvements shown in Table 8.

**Table #4**  
**Intersection #1 - S. Powhaton Road/E. 6th Avenue**  
**Harmony Phase 6**  
**Aurora, CO**  
**LSC #220300; August, 2023**

Warrant Analysis<sup>(1)</sup>

Warrant 1: Eight Hour Vehicular Volume Evaluation												Warrant 2: Four Hour Vehicular Volume Evaluation				Warrant 3: Peak Hour Vehicular Volume Evaluation			
												70% Warrant		Warrant Threshold		70% Warrant		Warrant Threshold	
												Threshold		Met?		Threshold		Met?	
												Minor	WB	Minor	WB	Minor	WB	Minor	WB
Hour	Major <sup>(2)</sup>	Minor 1 <sup>(3)</sup> EB Leg	Minor 2 <sup>(3)</sup> WB Leg	Warrant Thresholds		Warrant Threshold Met?		North Leg		South Leg		Minor	WB	Minor	WB				
				Condition A (70%)	Condition B (70%)			A	B	A	B	Minimum		Minimum					
2024 Background Traffic <sup>(4)</sup>																			
12-1 AM	88	13	0	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No		
1-2 AM	38	6	0	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No		
2-3 AM	62	9	0	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No		
3-4 AM	44	7	0	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No		
4-5 AM	187	28	0	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No		
5-6 AM	422	62	0	420	140	630	70	No	No	No	No	285	No	No	Low Vol	No	No		
6-7 AM	607	90	0	420	140	630	70	No	No	No	No	175	No	No	315	No	No		
7-8 AM	934	137	0	420	140	630	70	No	Yes	No	No	80	Yes	No	180	No	No		
8-9 AM	850	125	0	420	140	630	70	No	Yes	No	No	110	Yes	No	220	No	No		
9-10 AM	747	109	0	420	140	630	70	No	Yes	No	No	140	No	No	265	No	No		
10-11 AM	758	111	0	420	140	630	70	No	Yes	No	No	140	No	No	265	No	No		
11-12 PM	841	123	0	420	140	630	70	No	Yes	No	No	110	Yes	No	220	No	No		
12-1 PM	713	169	0	420	140	630	70	Yes	Yes	No	No	140	Yes	No	265	No	No		
1-2 PM	703	172	0	420	140	630	70	Yes	Yes	No	No	140	Yes	No	265	No	No		
2-3 PM	786	189	0	420	140	630	70	Yes	Yes	No	No	140	Yes	No	265	No	No		
3-4 PM	1061	255	0	420	140	630	70	Yes	Yes	No	No	80	Yes	No	145	Yes	No		
4-5 PM	1202	286	0	420	140	630	70	Yes	Yes	No	No	80	Yes	No	100	Yes	No		
5-6 PM	1324	311	0	420	140	630	70	Yes	Yes	No	No	80	Yes	No	100	Yes	No		
6-7 PM	818	194	0	420	140	630	70	Yes	Yes	No	No	110	Yes	No	220	No	No		
7-8 PM	529	123	0	420	140	630	70	No	No	No	No	230	No	No	370	No	No		
8-9 PM	436	99	0	420	140	630	70	No	No	No	No	285	No	No	Low Vol	No	No		
9-10 PM	328	81	0	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No		
10-11 PM	297	72	0	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No		
11-12 AM	117	30	0	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No		

Numbers of Hours the Warrant is Met  
Warrant Met? **7    12    0    0**  
**Yes**

**10    0**  
**Yes**

**3    0**  
**Yes**

<b>2024 Total Traffic<sup>(4)</sup></b>																	
12-1 AM	99	17	3	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
1-2 AM	43	7	1	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
2-3 AM	71	11	3	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
3-4 AM	51	8	2	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
4-5 AM	214	34	5	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
5-6 AM	485	74	14	420	140	630	70	No	No	No	No	285	No	No	Low Vol	No	No
6-7 AM	707	101	26	420	140	630	70	No	Yes	No	No	140	No	No	265	No	No
7-8 AM	1078	162	33	420	140	630	70	Yes	Yes	No	No	80	Yes	No	145	Yes	No
8-9 AM	983	146	32	420	140	630	70	Yes	Yes	No	No	80	Yes	No	180	No	No
9-10 AM	861	130	26	420	140	630	70	No	Yes	No	No	110	Yes	No	220	No	No
10-11 AM	873	133	26	420	140	630	70	No	Yes	No	No	110	Yes	No	220	No	No
11-12 PM	967	148	28	420	140	630	70	Yes	Yes	No	No	80	Yes	No	180	No	No
12-1 PM	831	221	16	420	140	630	70	Yes	Yes	No	No	110	Yes	No	220	Yes	No
1-2 PM	822	220	18	420	140	630	70	Yes	Yes	No	No	110	Yes	No	220	Yes	No
2-3 PM	917	244	19	420	140	630	70	Yes	Yes	No	No	80	Yes	No	180	Yes	No
3-4 PM	1236	330	25	420	140	630	70	Yes	Yes	No	No	80	Yes	No	100	Yes	No
4-5 PM	1400	373	28	420	140	630	70	Yes	Yes	No	No	80	Yes	No	100	Yes	No
5-6 PM	1541	409	29	420	140	630	70	Yes	Yes	No	No	80	Yes	No	100	Yes	No
6-7 PM	954	254	19	420	140	630	70	Yes	Yes	No	No	80	Yes	No	180	Yes	No
7-8 PM	615	164	11	420	140	630	70	Yes	No	No	No	175	No	No	315	No	No
8-9 PM	506	134	9	420	140	630	70	No	No	No	No	230	No	No	370	No	No
9-10 PM	384	103	9	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
10-11 PM	346	92	8	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
11-12 AM	137	37	4	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No

Numbers of Hours the Warrant is Met  
Warrant Met? **11    13    0    0**  
**Yes**

**12    0**  
**Yes**

**8    0**  
**Yes**

- Notes:
- (1) Thresholds are based on 2 or more lanes on the major approach and 2 or more lanes on the minor approach with the 70% factor applied for a posted speed limit above 40 mph
  - (2) The major street traffic includes all movements (left, through, and right)
  - (3) The minor street traffic includes left, through, and half of right-turn volumes from the minor street
  - (4) Off peak traffic volumes are based on the 24-hour machine counts on Powhaton Road south of E. Alameda Avenue conducted by Counter Measures March 2022

Source: LSC Transportation Consultants, Inc.

**Table #5**  
**Intersection #3 - E. 6th Avenue/Trussville Street**  
**Harmony Phase 6**  
**Aurora, CO**  
**LSC #220300; August, 2023**

Warrant Analysis<sup>(1)</sup>

Warrant 1: Eight Hour Vehicular Volume Evaluation												Warrant 2: Four Hour Vehicular Volume Evaluation			Warrant 3: Peak Hour Vehicular Volume Evaluation		
				Warrant Thresholds				Warrant Threshold Met?				70% Warrant Threshold Minor Minimum	Warrant Threshold		70% Warrant Threshold Minor Minimum	Warrant Threshold	
Hour	Major <sup>(2)</sup>	Minor 1 <sup>(3)</sup> NB Leg	Minor 2 <sup>(3)</sup> SB Leg	Condition A (70%)		Condition B (70%)		North Leg		South Leg			Met?	WB		Met?	WB
2040 Background Traffic <sup>(4)</sup>																	
12-1 AM	134	3	143	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
1-2 AM	58	3	21	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
2-3 AM	86	4	9	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
3-4 AM	66	3	6	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
4-5 AM	282	8	9	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
5-6 AM	619	21	39	420	140	630	70	No	No	No	No	175	No	No	315	No	No
6-7 AM	859	36	70	420	140	630	70	No	No	No	No	110	No	No	220	No	No
7-8 AM	1361	47	66	420	140	630	70	No	No	No	No	80	No	No	100	No	No
8-9 AM	1229	45	143	420	140	630	70	No	No	Yes	Yes	80	No	Yes	100	No	Yes
9-10 AM	1093	37	120	420	140	630	70	No	No	No	Yes	80	No	Yes	145	No	No
10-11 AM	1115	36	119	420	140	630	70	No	No	No	Yes	80	No	Yes	120	No	No
11-12 PM	1240	40	127	420	140	630	70	No	No	No	Yes	80	No	Yes	100	No	Yes
12-1 PM	901	27	125	420	140	630	70	No	No	No	Yes	80	No	Yes	180	No	No
1-2 PM	897	29	75	420	140	630	70	No	No	No	Yes	110	No	No	220	No	No
2-3 PM	998	31	70	420	140	630	70	No	No	No	No	80	No	No	180	No	No
3-4 PM	1345	42	80	420	140	630	70	No	No	No	Yes	80	No	Yes	100	No	No
4-5 PM	1520	46	109	420	140	630	70	No	No	No	Yes	80	No	Yes	100	No	Yes
5-6 PM	1667	49	125	420	140	630	70	No	No	No	Yes	80	No	Yes	100	No	Yes
6-7 PM	1034	31	142	420	140	630	70	No	No	Yes	Yes	80	No	Yes	145	No	No
7-8 PM	663	18	86	420	140	630	70	No	No	No	Yes	175	No	No	315	No	No
8-9 PM	544	15	59	420	140	630	70	No	No	No	No	230	No	No	370	No	No
9-10 PM	419	14	50	420	140	630	70	No	No	No	No	285	No	No	Low Vol	No	No
10-11 PM	377	12	32	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
11-12 AM	151	6	31	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No

Numbers of Hours the Warrant is Met

0	0	2	11
Warrant Met? Yes			

0	9
Warrant Met? Yes	

0	4
Warrant Met? Yes	

**2040 Total Traffic<sup>(4)</sup>**

12-1 AM	142	5	143	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
1-2 AM	62	3	21	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
2-3 AM	90	7	9	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
3-4 AM	70	4	6	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
4-5 AM	298	13	9	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No
5-6 AM	648	36	39	420	140	630	70	No	No	No	No	175	No	No	315	No	No
6-7 AM	890	62	70	420	140	630	70	No	No	No	No	110	No	No	220	No	No
7-8 AM	1422	82	66	420	140	630	70	No	Yes	No	No	80	Yes	No	100	No	No
8-9 AM	1282	77	143	420	140	630	70	No	Yes	Yes	Yes	80	No	Yes	100	No	Yes
9-10 AM	1143	64	120	420	140	630	70	No	No	No	Yes	80	No	Yes	120	No	Yes
10-11 AM	1168	63	119	420	140	630	70	No	No	No	Yes	80	No	Yes	120	No	No
11-12 PM	1299	69	127	420	140	630	70	No	No	No	Yes	80	No	Yes	100	No	Yes
12-1 PM	979	45	125	420	140	630	70	No	No	No	Yes	80	No	Yes	180	No	No
1-2 PM	974	47	75	420	140	630	70	No	No	No	Yes	80	No	No	180	No	No
2-3 PM	1084	51	70	420	140	630	70	No	No	No	No	80	No	No	145	No	No
3-4 PM	1463	69	80	420	140	630	70	No	No	No	Yes	80	No	Yes	100	No	No
4-5 PM	1654	75	109	420	140	630	70	No	Yes	No	Yes	80	No	Yes	100	No	Yes
5-6 PM	1816	80	125	420	140	630	70	No	Yes	No	Yes	80	Yes	Yes	100	No	Yes
6-7 PM	1125	51	142	420	140	630	70	No	No	Yes	Yes	80	No	Yes	120	No	Yes
7-8 PM	724	31	86	420	140	630	70	No	No	No	Yes	140	No	No	265	No	No
8-9 PM	594	24	59	420	140	630	70	No	No	No	No	230	No	No	370	No	No
9-10 PM	454	23	50	420	140	630	70	No	No	No	No	285	No	No	Low Vol	No	No
10-11 PM	409	19	32	420	140	630	70	No	No	No	No	285	No	No	Low Vol	No	No
11-12 AM	164	9	31	420	140	630	70	No	No	No	No	Low Vol	No	No	Low Vol	No	No

Numbers of Hours the Warrant is Met

0	4	2	11
Warrant Met? Yes			

2	9
Warrant Met? Yes	

0	6
Warrant Met? Yes	

Notes:

- (1) Thresholds are based on 2 or more lanes on the major approach and 2 or more lanes on the minor approach with the 70% factor applied for a posted speed limit above 40 mph  
(2) The major street traffic includes all movements (left, through, and right)  
(3) The minor street traffic includes left, through, and half of right-turn volumes from the minor street  
(4) Off peak traffic volumes are based on the 24-hour machine counts on Powhatan Road south of E. Alameda Avenue conducted by Counter Measures March 2022

Source: LSC Transportation Consultants, Inc.

**Table #6**  
**Intersection #9 - S. Powhaton Road/E. 1st Avenue/E. Ellsworth Avenue**  
**Harmony Phase 6**  
**Aurora, CO**  
**LSC #220300; August, 2023**

Warrant Analysis<sup>(1)</sup>

Warrant 1: Eight Hour Vehicular Volume Evaluation													Warrant 2: Four Hour Vehicular Volume Evaluation			Warrant 3: Peak Hour Vehicular Volume Evaluation				
													70% Warrant		70% Warrant		70% Warrant			
													Threshold		Warrant Threshold		Threshold		Warrant Threshold	
													Minor	Met?	Minor	Met?	Minor	Met?		
Hour	Major <sup>(2)</sup>	Minor 1 <sup>(3)</sup> EB Leg	Minor 2 <sup>(3)</sup> WB Leg	Condition A (70%)		Condition B (70%)		EB Leg		WB Leg		Minimum	EB	WB	Minimum	EB	WB			
2024 Background Traffic <sup>(4)</sup>																				
12-1 AM	80	9	17	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No			
1-2 AM	34	5	7	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No			
2-3 AM	48	7	12	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No			
3-4 AM	39	5	8	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No			
4-5 AM	167	21	35	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No			
5-6 AM	356	46	81	420	105	630	53	No	No	No	No	260	No	No	Low Vol	No	No			
6-7 AM	480	71	120	420	105	630	53	No	No	Yes	No	215	No	No	340	No	No			
7-8 AM	781	103	180	420	105	630	53	No	Yes	Yes	Yes	100	Yes	Yes	200	No	No			
8-9 AM	699	95	165	420	105	630	53	No	Yes	Yes	Yes	140	No	Yes	245	No	No			
9-10 AM	630	82	144	420	105	630	53	No	No	Yes	No	140	No	Yes	245	No	No			
10-11 AM	646	82	146	420	105	630	53	No	Yes	Yes	Yes	140	No	Yes	245	No	No			
11-12 PM	718	91	160	420	105	630	53	No	Yes	Yes	Yes	100	No	Yes	200	No	No			
12-1 PM	746	36	65	420	105	630	53	No	No	No	Yes	100	No	No	200	No	No			
1-2 PM	731	38	67	420	105	630	53	No	No	No	Yes	100	No	No	200	No	No			
2-3 PM	819	41	74	420	105	630	53	No	No	No	Yes	80	No	No	170	No	No			
3-4 PM	1105	55	100	420	105	630	53	No	Yes	No	Yes	60	No	Yes	95	No	Yes			
4-5 PM	1256	61	111	420	105	630	53	No	Yes	Yes	Yes	60	Yes	Yes	80	No	Yes			
5-6 PM	1390	67	119	420	105	630	53	No	Yes	Yes	Yes	60	Yes	Yes	75	No	Yes			
6-7 PM	856	41	75	420	105	630	53	No	No	No	Yes	80	No	No	170	No	No			
7-8 PM	559	26	47	420	105	630	53	No	No	No	No	170	No	No	285	No	No			
8-9 PM	461	21	38	420	105	630	53	No	No	No	No	215	No	No	340	No	No			
9-10 PM	340	18	31	420	105	630	53	No	No	No	No	260	No	No	Low Vol	No	No			
10-11 PM	310	16	28	420	105	630	53	No	No	No	No	260	No	No	Low Vol	No	No			
11-12 AM	119	6	12	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No			

Numbers of Hours the Warrant is Met

0

7

8

11

Warrant Met?

Yes

3

8

Yes

0

3

Yes

**2024 Total Traffic<sup>(4)</sup>**

12-1 AM	82	9	29	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No
1-2 AM	35	5	12	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No
2-3 AM	51	7	16	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No
3-4 AM	40	5	13	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No
4-5 AM	172	21	57	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No
5-6 AM	370	46	120	420	105	630	53	No	No	No	No	260	No	No	Low Vol	No	No
6-7 AM	503	71	158	420	105	630	53	No	No	Yes	No	170	No	No	285	No	No
7-8 AM	811	103	262	420	105	630	53	No	Yes	Yes	Yes	80	Yes	Yes	170	No	Yes
8-9 AM	728	95	234	420	105	630	53	No	Yes	Yes	Yes	100	No	Yes	200	No	Yes
9-10 AM	654	82	212	420	105	630	53	No	Yes	Yes	Yes	140	No	Yes	245	No	No
10-11 AM	668	82	219	420	105	630	53	No	Yes	Yes	Yes	140	No	Yes	245	No	No
11-12 PM	743	91	242	420	105	630	53	No	Yes	Yes	Yes	100	No	Yes	200	No	Yes
12-1 PM	807	36	105	420	105	630	53	No	No	No	Yes	80	No	Yes	170	No	No
1-2 PM	798	38	104	420	105	630	53	No	No	No	Yes	100	No	Yes	200	No	No
2-3 PM	891	41	116	420	105	630	53	No	No	Yes	Yes	80	No	Yes	170	No	No
3-4 PM	1202	55	158	420	105	630	53	No	Yes	Yes	Yes	60	No	Yes	80	No	Yes
4-5 PM	1363	61	178	420	105	630	53	No	Yes	Yes	Yes	60	Yes	Yes	75	No	Yes
5-6 PM	1503	67	195	420	105	630	53	No	Yes	Yes	Yes	60	Yes	Yes	75	No	Yes
6-7 PM	928	41	121	420	105	630	53	No	No	Yes	Yes	65	No	Yes	145	No	No
7-8 PM	602	26	78	420	105	630	53	No	No	No	No	140	No	No	245	No	No
8-9 PM	495	21	65	420	105	630	53	No	No	No	No	215	No	No	340	No	No
9-10 PM	372	18	48	420	105	630	53	No	No	No	No	260	No	No	Low Vol	No	No
10-11 PM	338	16	44	420	105	630	53	No	No	No	No	260	No	No	Low Vol	No	No
11-12 AM	132	6	18	420	105	630	53	No	No	No	No	Low Vol	No	No	Low Vol	No	No

Numbers of Hours the Warrant is Met

0

8

11

12

Warrant Met?

Yes

3

12

Yes

0

6

Yes

Notes:

(1) Thresholds are based on 2 or more lanes on the major approach and 1 lane on the minor approach with the 70% factor applied for a posted speed limit above 40 mph

(2) The major street traffic includes all movements (left, through, and right)

(3) The minor street traffic includes left, through, and half of right-turn volumes from the minor street

(4) Off peak traffic volumes are based on the 24-hour machine counts on Powhaton Road south of E. Alameda Avenue conducted by Counter Measures March 2022

Source: LSC Transportation Consultants, Inc.



**Table 7**  
**Traffic Signal Warrant Summary**  
**Harmony Phase 6**  
**Aurora, CO**  
**LSC #220300; August, 2023**

Intersection No. & Location	Intersection Specific Table	Scenario Where Traffic Signal Warrant(s) Are Projected To Be Met
1) S. Powhaton Road/E. 6th Avenue	Table 4	2024 Background
3) E. 6th Avenue/Trussville Street	Table 5	2040 Background
9) S. Powhaton Road/E. 1st Avenue/E. Ellsworth Avenue	Table 6	2024 Background

Table 8 (Page 1 of 2)  
Recommended Improvements to Public Street Network  
Harmony Phase 6  
Aurora, CO  
LSC #220300; August, 2023

Inter-section No.	Intersection Location	Recommended Improvements by 2024 <sup>(1)</sup>		Recommended Improvements by 2040 <sup>(1)</sup>	
			Responsibility		Responsibility
#1	S. Powhaton Road/E. 6th Avenue	WB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	WB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Others
		NB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	SB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Others
		NB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	EB to SB RT Accel - construct lane - 1 @ 390 feet and 160-foot transition taper	Others
		SB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	NB LT - construct 2nd lane - 2 @ 275 feet and 325-foot transition taper	Others
		Traffic signalization when warranted	Applicant/Others		
#2	E. 6th Avenue/N. Robertsdale St			WB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant
#3	E. 6th Avenue/Trussville Street	NB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Applicant	EB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Others
				WB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant
				SB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Others
				SB RT - construct lane - 1 @ 200 feet and 120-foot transition taper	Others
				Traffic signalization when warranted	Applicant/Others
#7	S. Powhaton Road Road/E. 3rd Avenue	NB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant		
		NB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Others		
		SB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant		
#9	S. Powhaton Road/E. 1st Avenue/ Ellsworth Avenue	NB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	If the westbound queue on E. Ellsworth Avenue regularly blocks the first intersection to the east (N. Quantock Street) the existing on-street parking may need to be removed to add eastbound and westbound left-turn lanes	Others
		Traffic signalization when warranted	Applicant/Others		

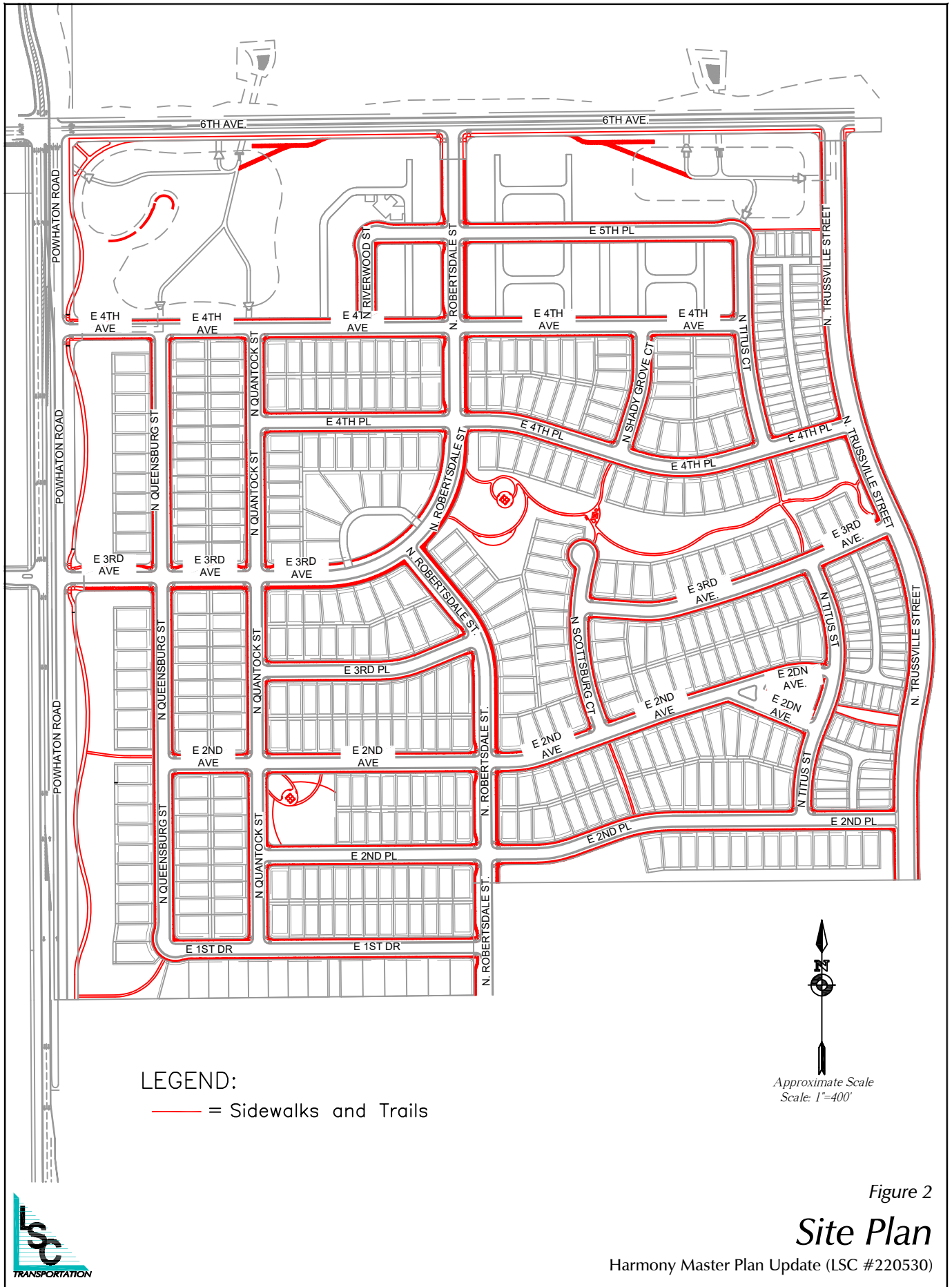
(1) A transition taper of 13.5:1 was used for Major and Minor Arterials based on a posted speed limit of 45 mph (160 feet).  
Dual left-turn lanes have transition taper lengths of 325 feet. An appropriate redirect taper for 45 mph is 45:1  
A transition taper of 10:1 was used for all Collectors based on a posted speed limit of 35 mph (120 feet). An appropriate redirect taper for 35 mph is 20:1

Table 8 (Page 2 of 2)  
Recommended Improvements to Public Street Network  
Harmony Phase 6  
Aurora, CO  
LSC #220300; August, 2023

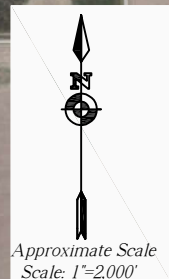
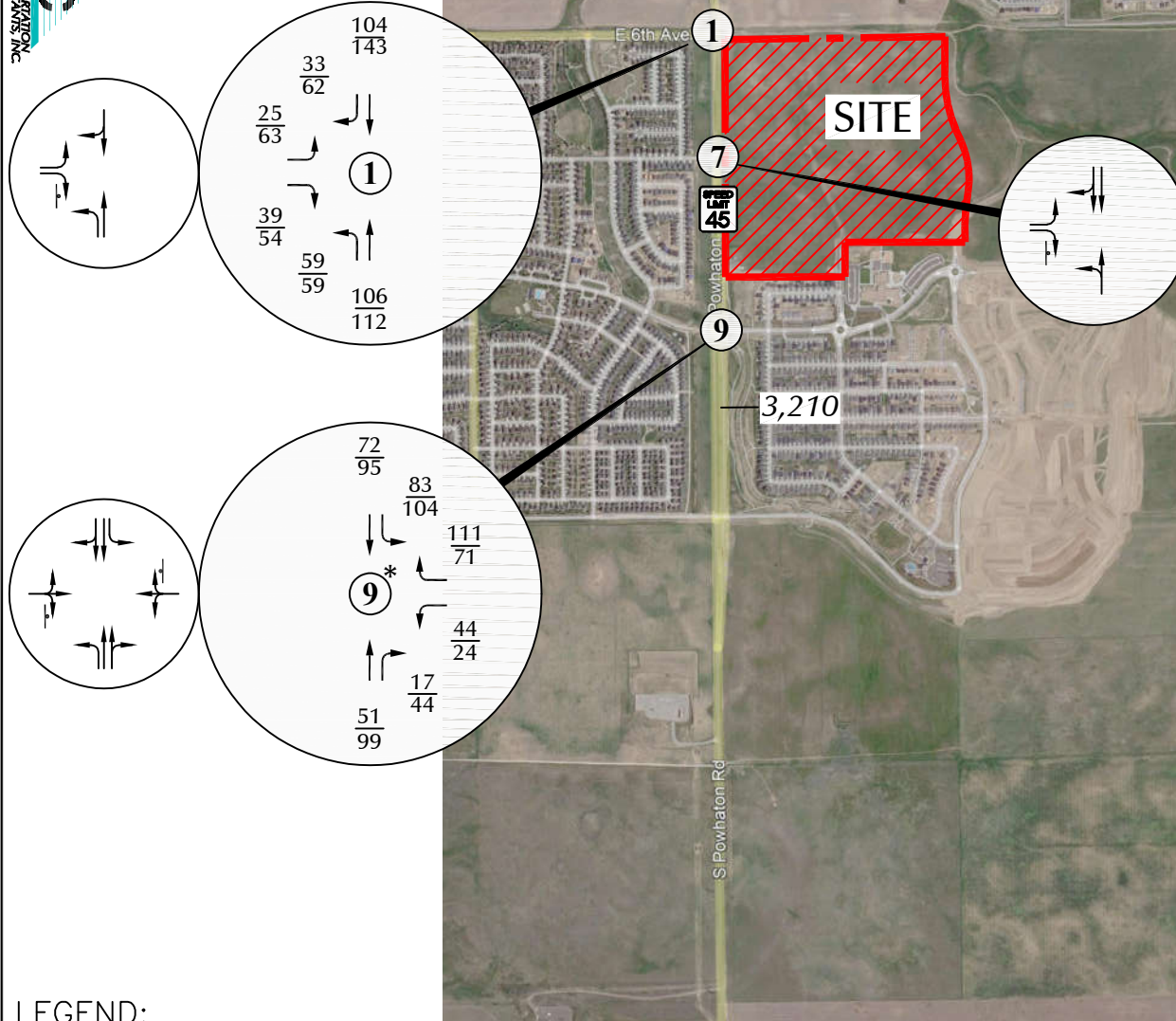
Inter-section No.	Intersection Location	Recommended Improvements by 2040 <sup>(1)</sup>			Responsibility
#10	Trussville Street/E. Ellsworth Avenue	Existing single lane modern roundabout			
#33	S. Powhaton Road/E. 4th Avenue	NB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant		
#34	Trussville Street/E. 4th Place	NB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Applicant		
#35	Trussville Street/E. 3rd Avenue	NB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Applicant	SB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Others
#37	Trussville Street/E. 2nd Place	NB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Applicant	SB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Others
#38	Trussville Street/E. Ellsworth Avenue	Existing single lane modern roundabout			

(1) A transition taper of 13.5:1 was used for Major and Minor Arterials based on a posted speed limit of 45 mph (160 feet).  
Dual left-turn lanes have transition taper lengths of 325 feet. An appropriate redirect taper for 45 mph is 45:1  
A transition taper of 10:1 was used for all Collectors based on a posted speed limit of 35 mph (120 feet). An appropriate redirect taper for 35 mph is 20:1









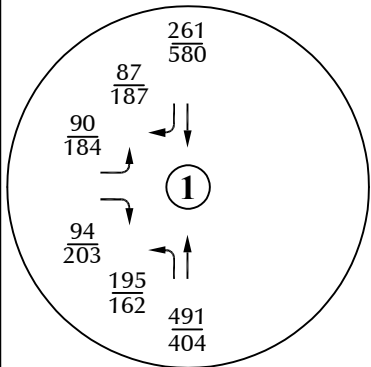
\* Traffic counts were conducted prior to the recent widening of Powhatan Road which included the extension of E. 1st Avenue to Powhatan Road.

Figure 3

# Existing Traffic, Lane Geometry and Traffic Control

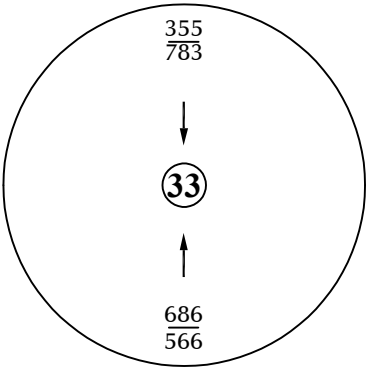
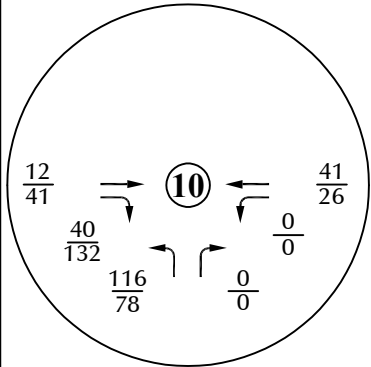
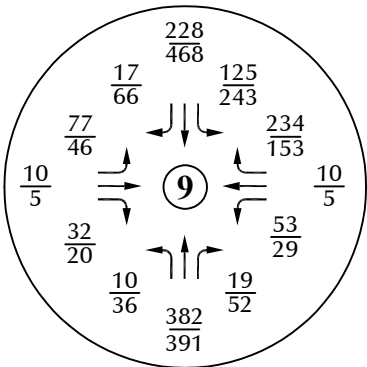
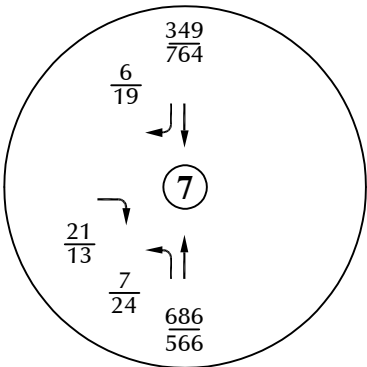
Harmony Phase 6 (LSC #220300)





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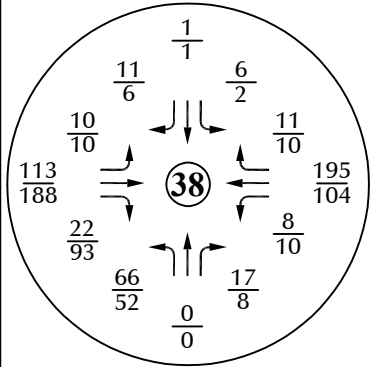
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LEGEND:  
 $\frac{26}{35}$  = AM Peak Hour Traffic  
 $\frac{35}{26}$  = PM Peak Hour Traffic  
1,000 = Average Daily Traffic

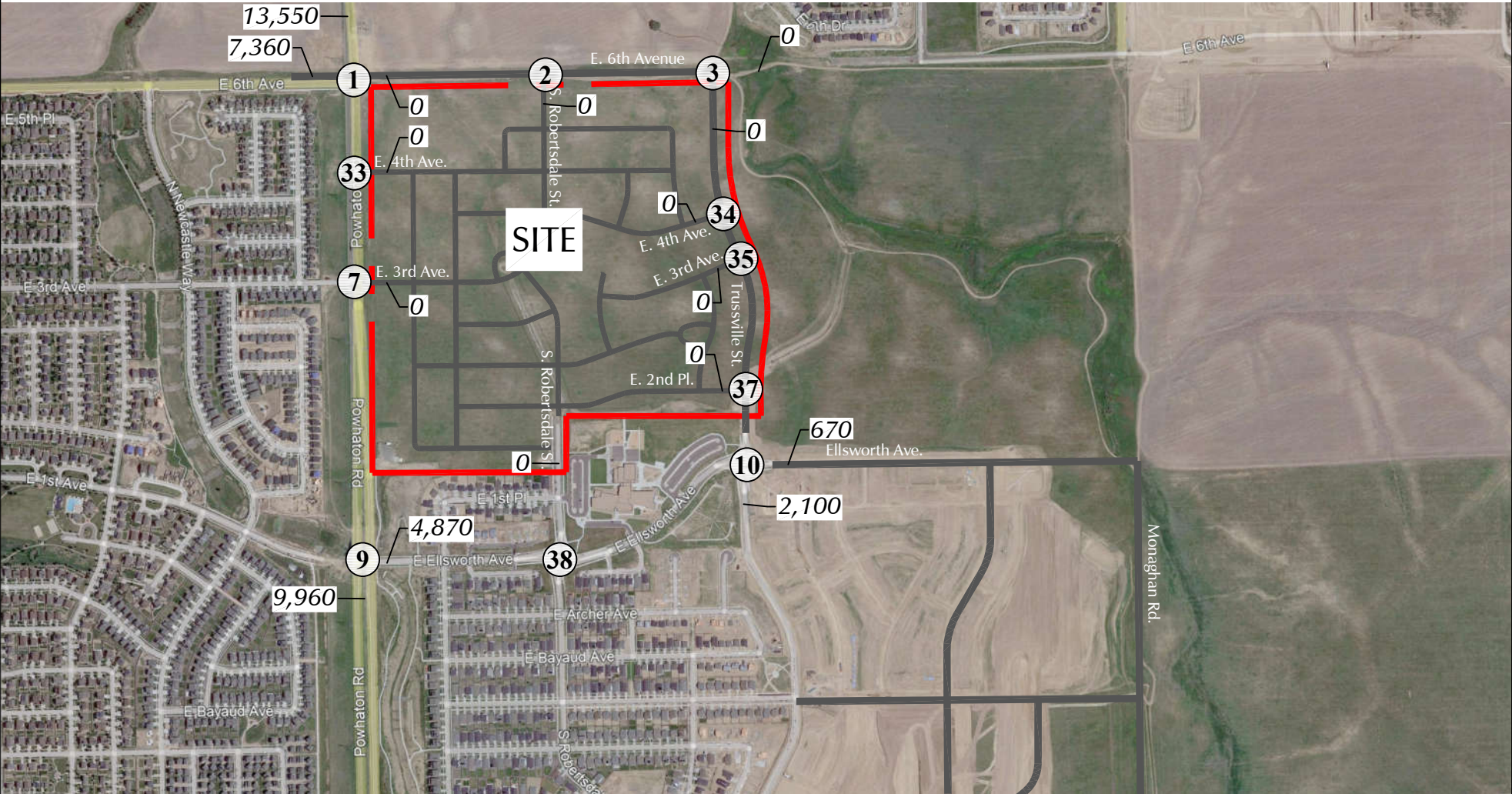
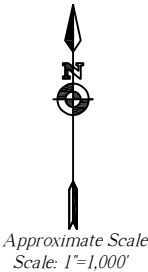


Figure 4a  
Year 2024  
Background Traffic  
Harmony Phase 6 (LSC #220300)





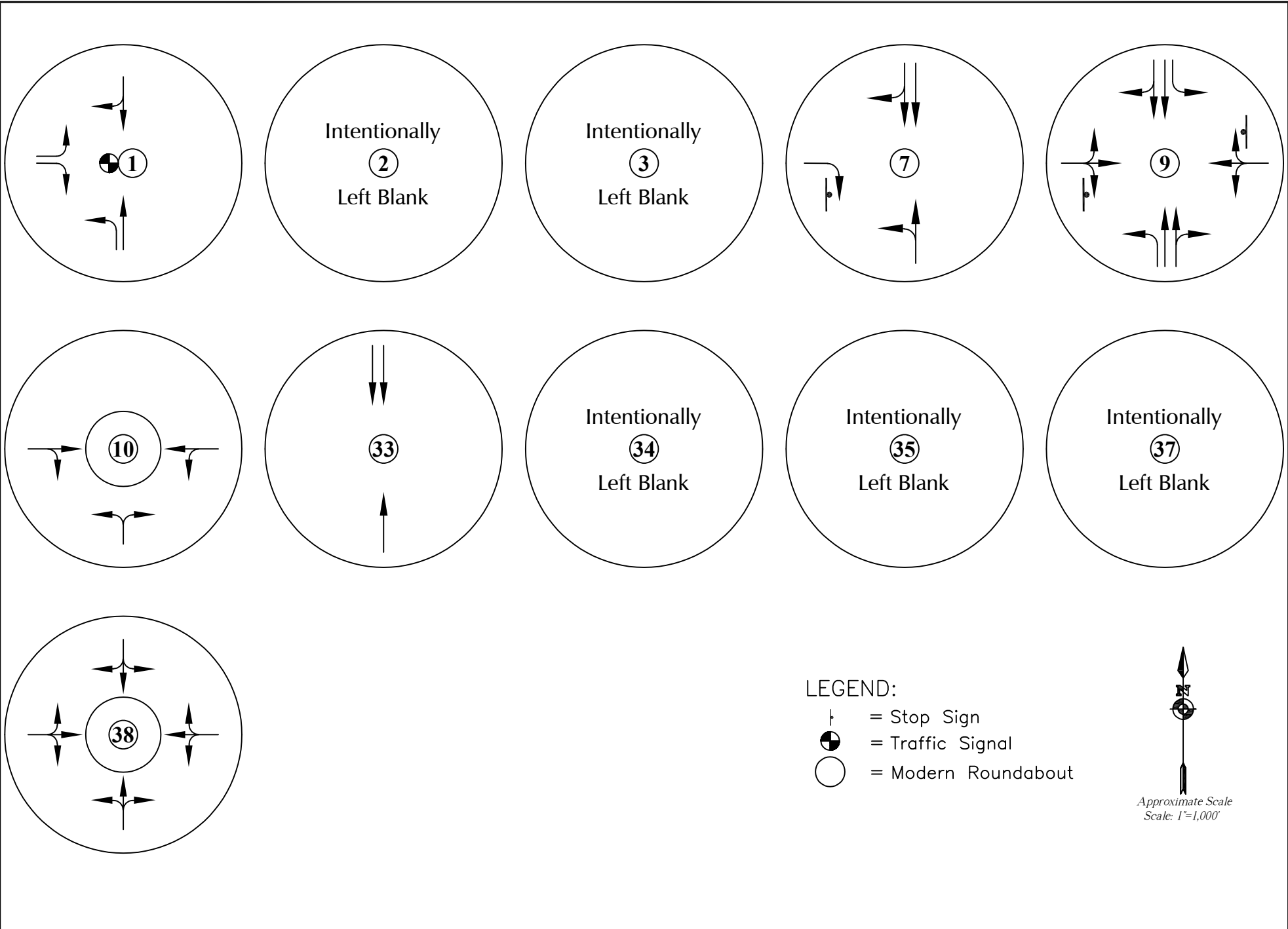


Figure 4b

Year 2024 Background  
Lane Geometry and Traffic Control

Harmony Phase 6 (LSC #220300)





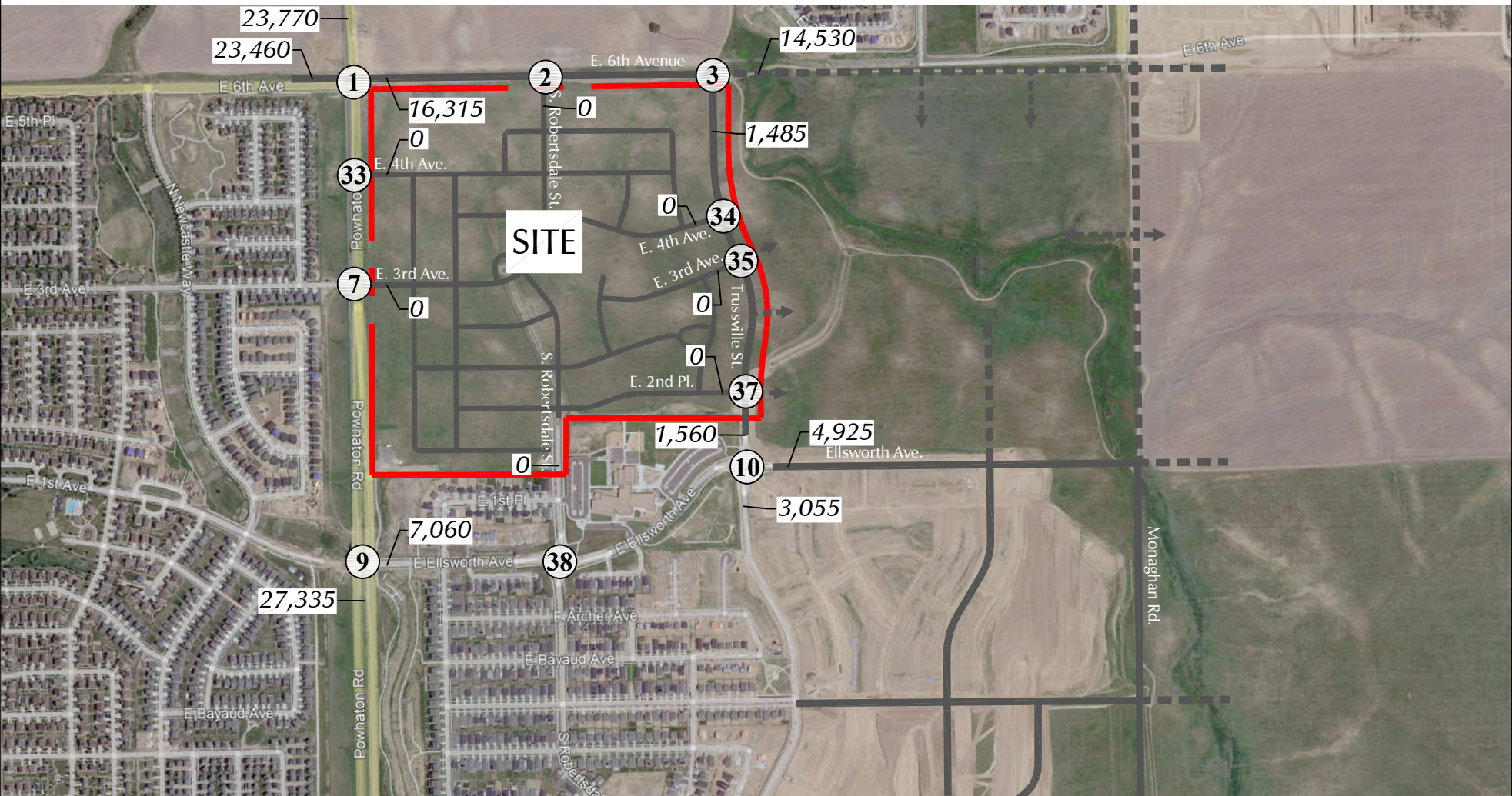
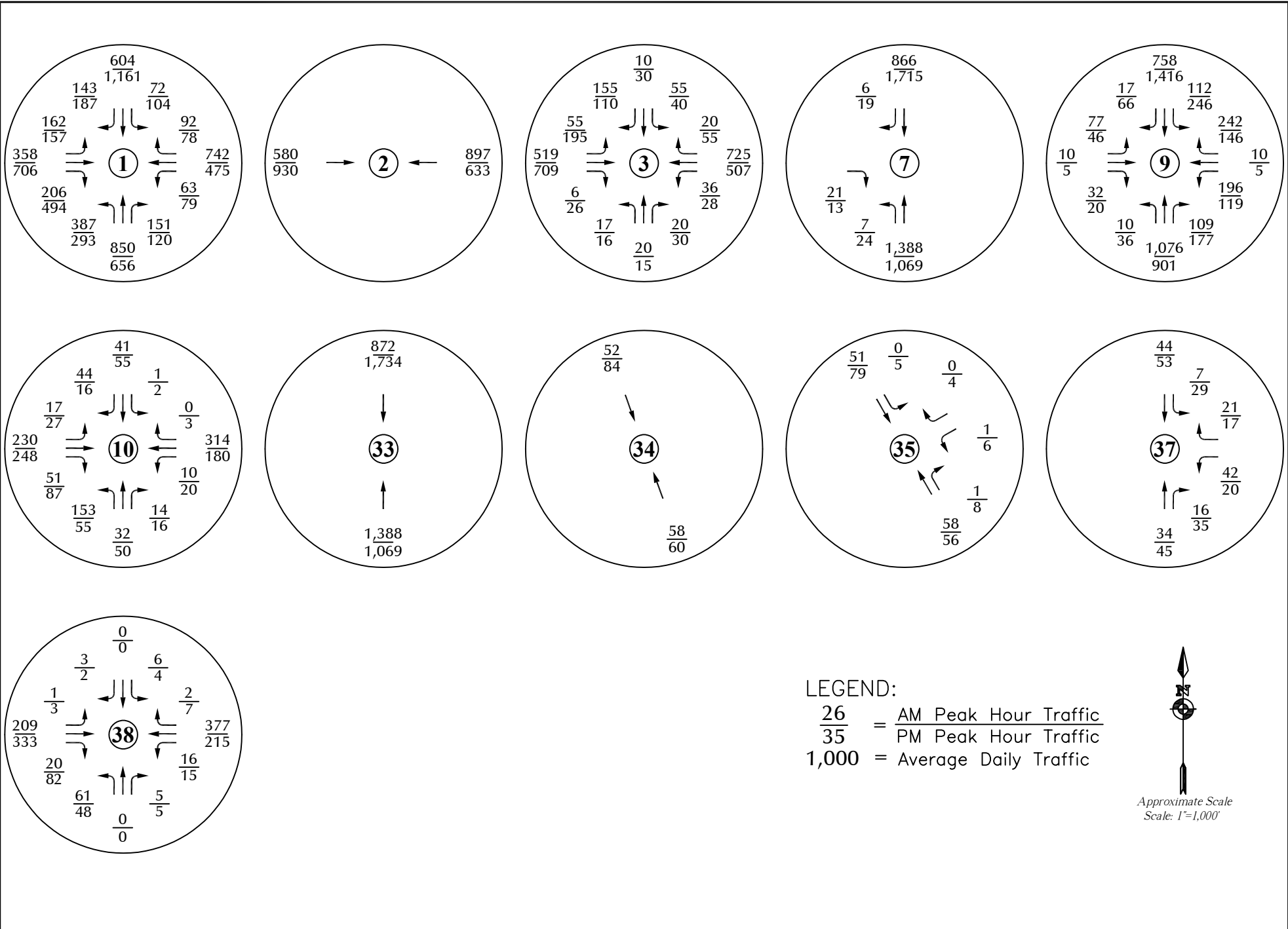


Figure 5a  
**Year 2040**  
**Background Traffic**  
 Harmony Phase 6 (LSC #220300)





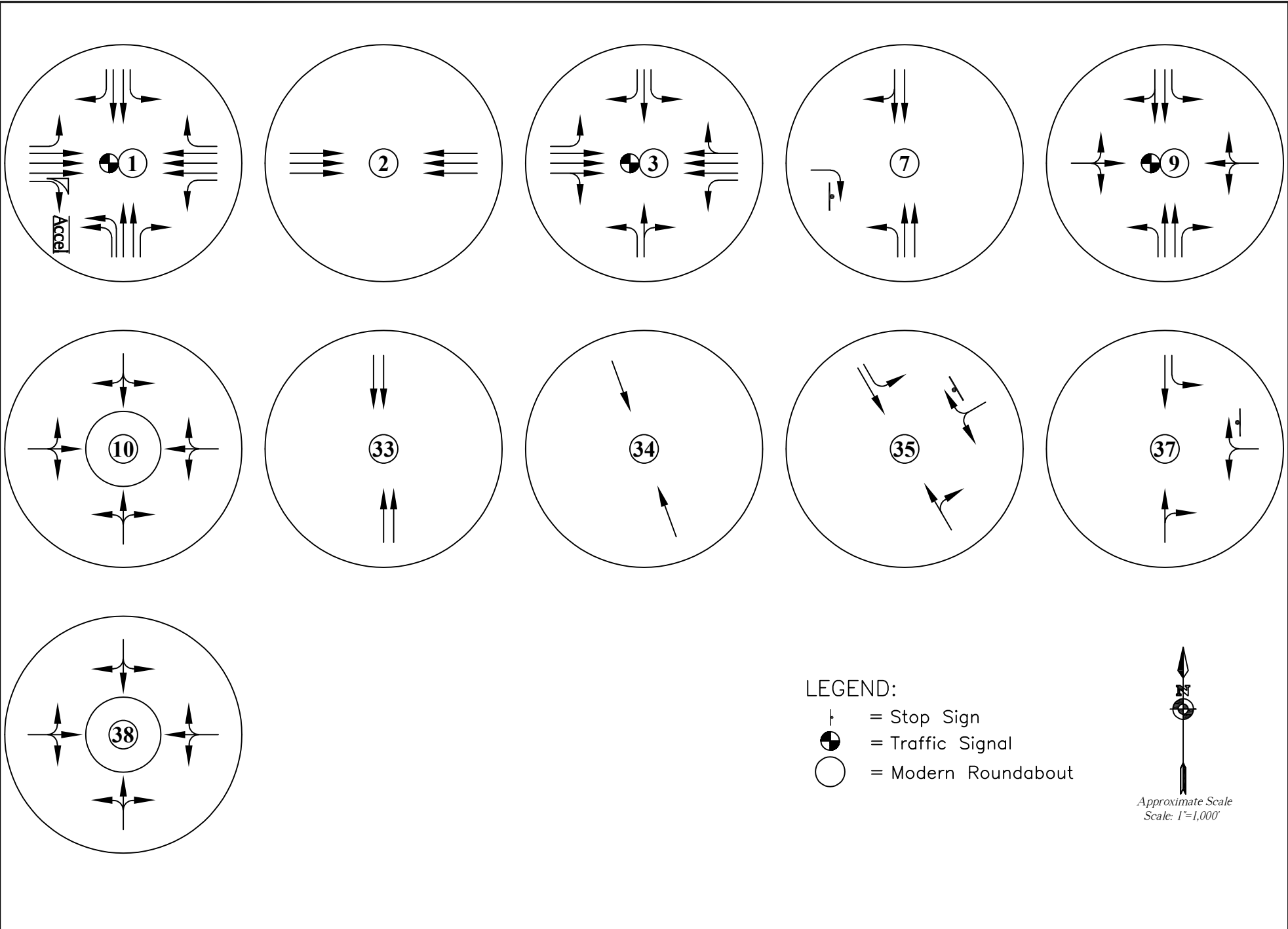


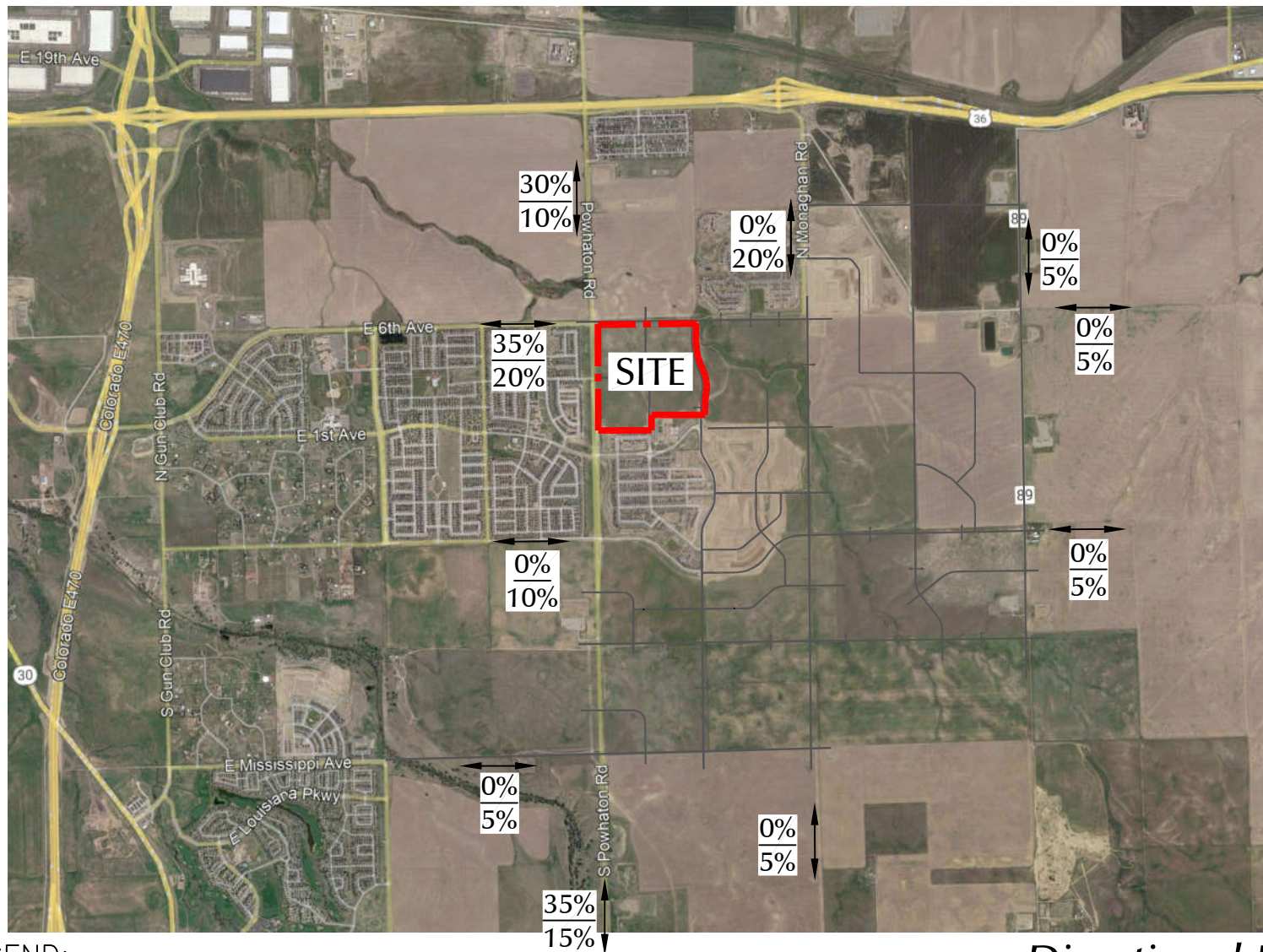
Figure 5b

Year 2040 Background  
Lane Geometry and Traffic Control

Harmony Phase 6 (LSC #220300)







LEGEND:

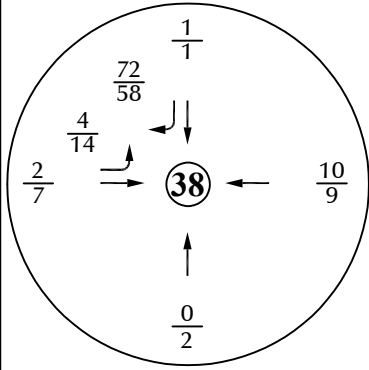
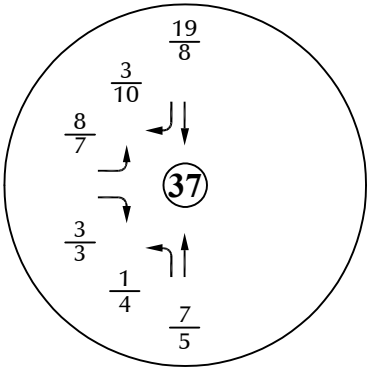
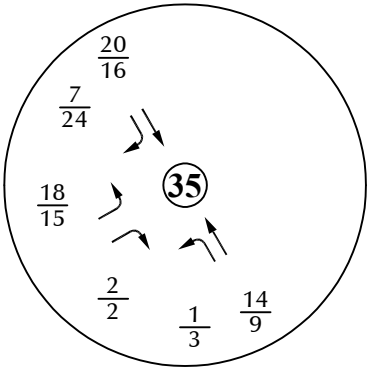
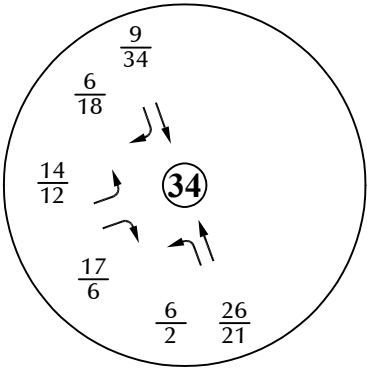
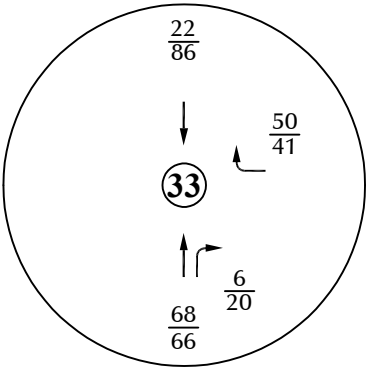
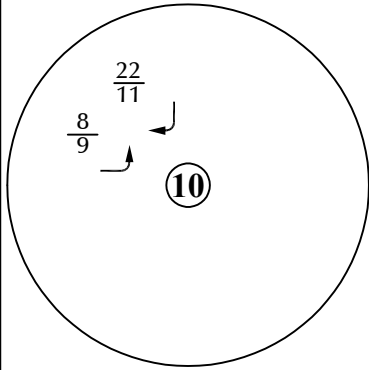
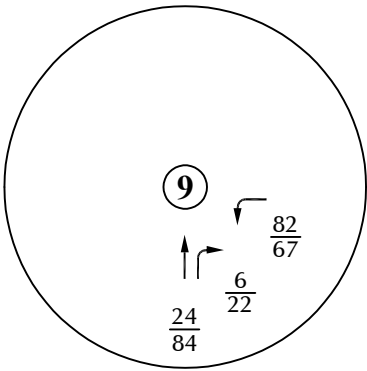
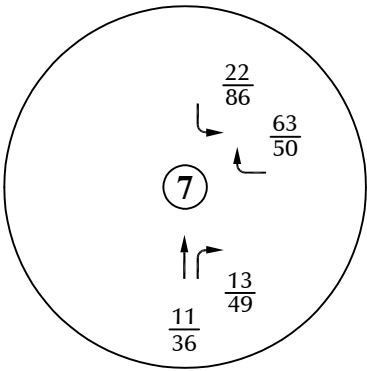
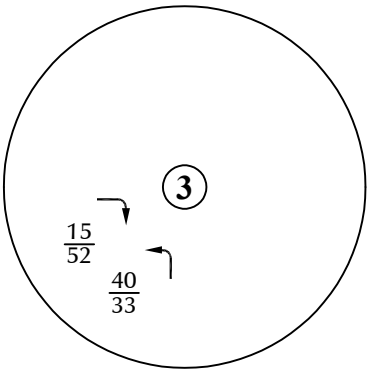
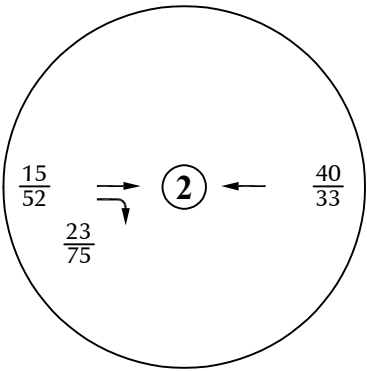
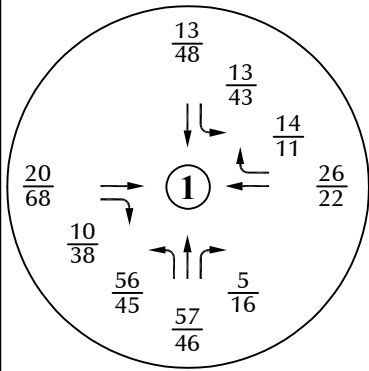
$\frac{5\%}{5\%}$  = Short-Term Percent Directional Distribution  
 $\frac{5\%}{5\%}$  = Long-Term Percent Directional Distribution

## Directional Distribution of Site-Generated Traffic

Harmony Phase 6 (LSC #220300)

Figure 6





LEGEND:  
 $\frac{26}{35}$  = AM Peak Hour Traffic  
 $\frac{35}{26}$  = PM Peak Hour Traffic  
 1,000 = Average Daily Traffic

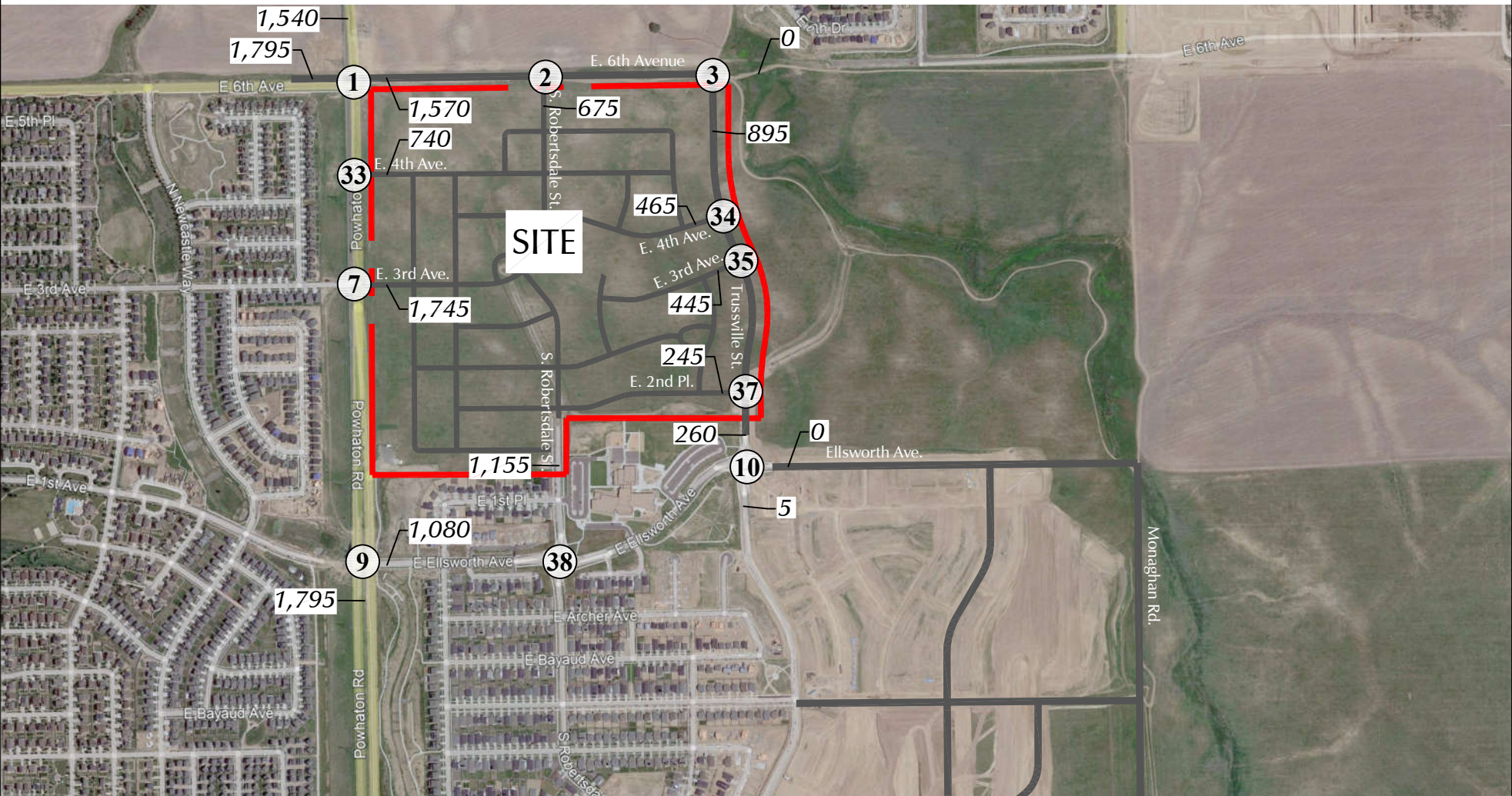
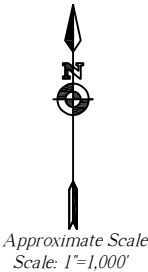


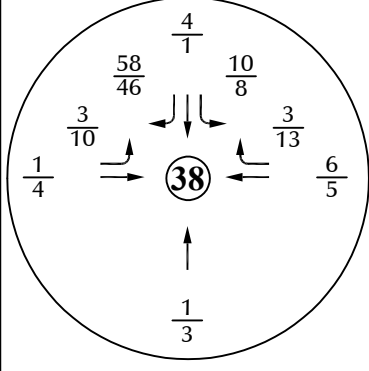
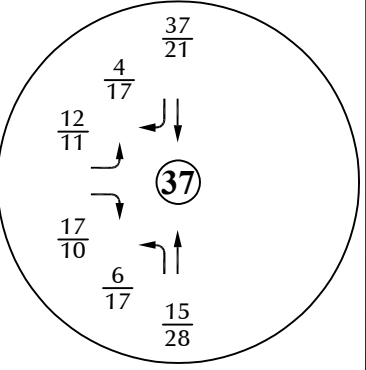
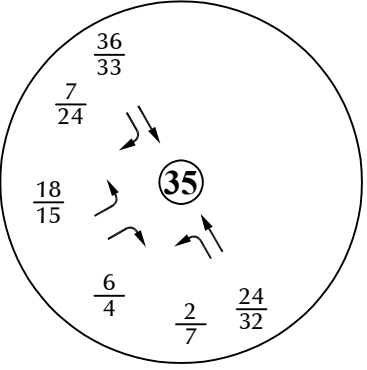
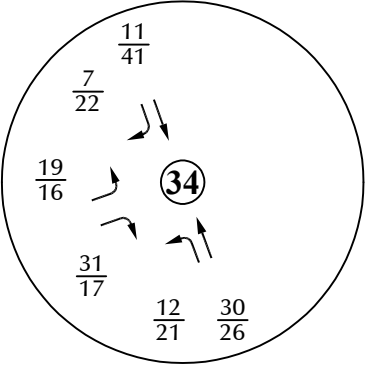
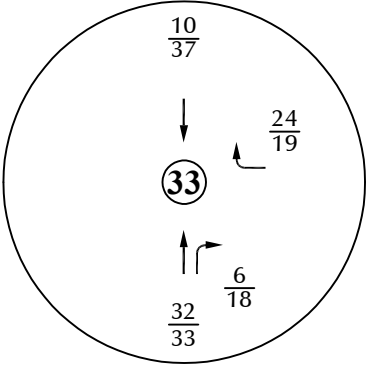
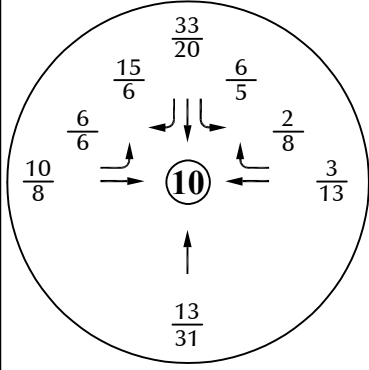
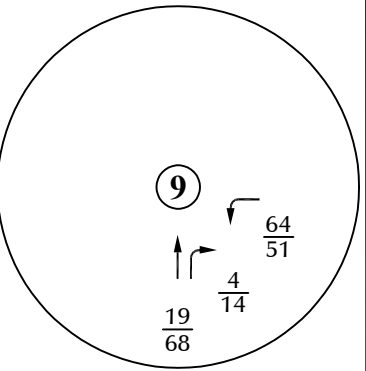
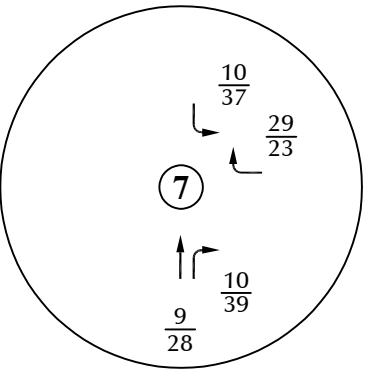
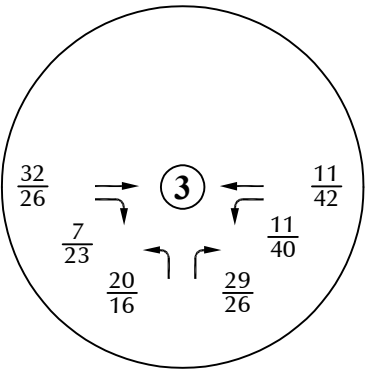
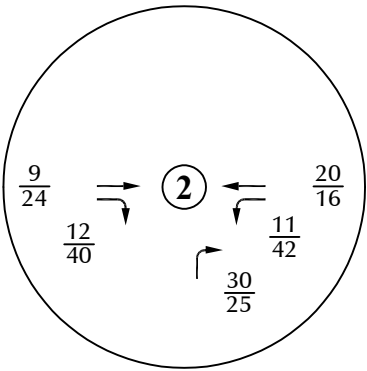
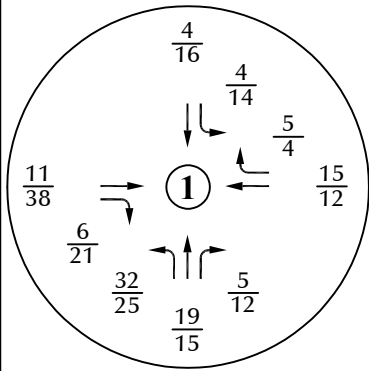
Figure 7

# Short-Term Assignment of Site-Generated Traffic

Harmony Master Plan Update (LSC #220530)







LEGEND:  
 $\frac{26}{35}$  = AM Peak Hour Traffic  
 $\frac{35}{35}$  = PM Peak Hour Traffic  
 1,000 = Average Daily Traffic

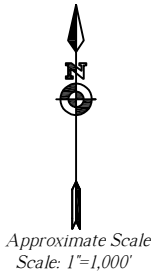


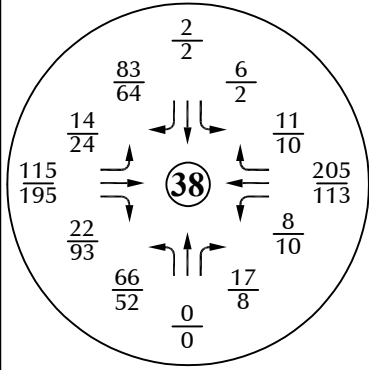
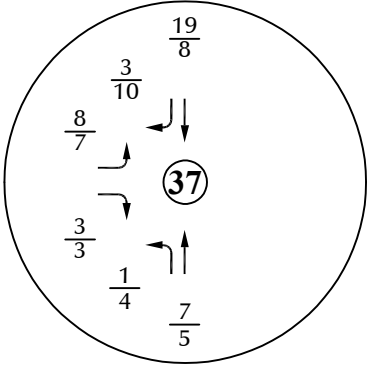
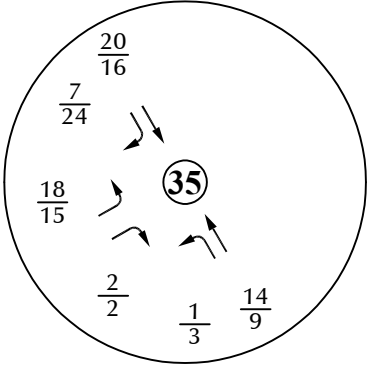
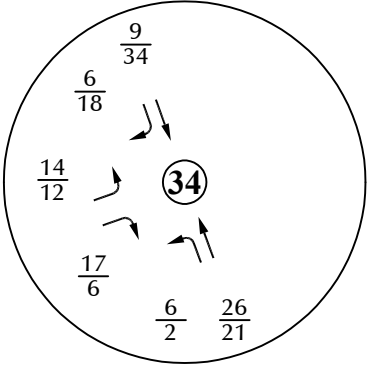
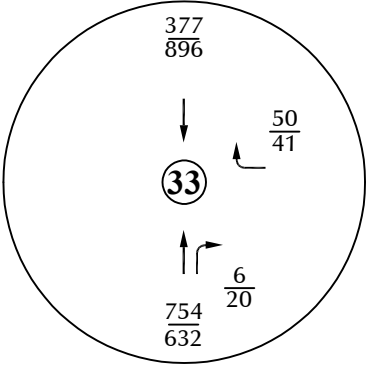
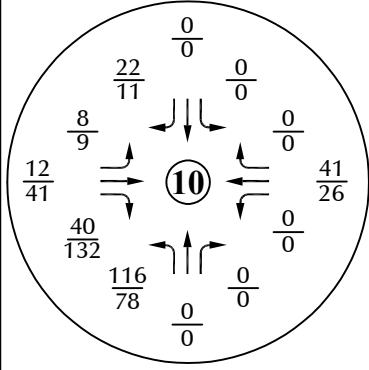
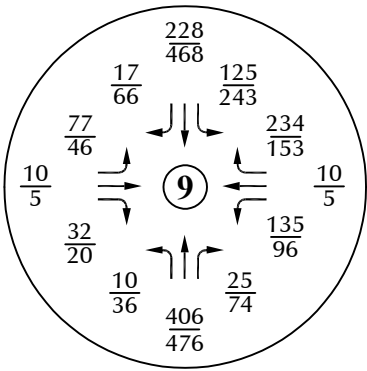
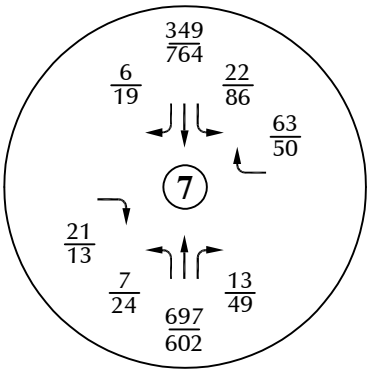
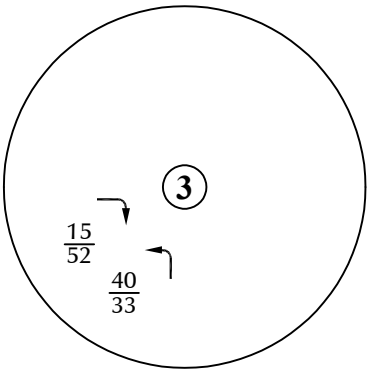
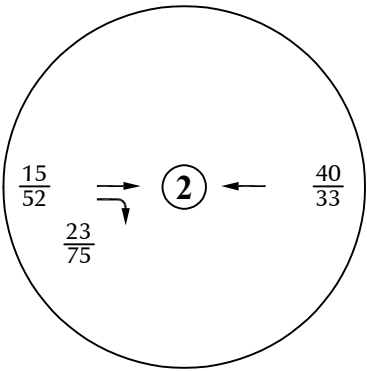
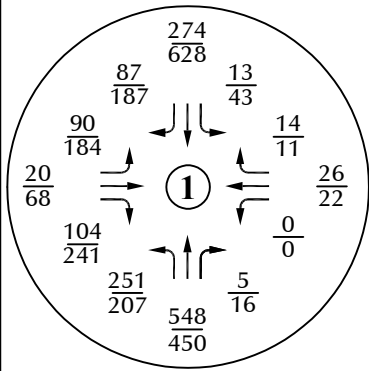
Figure 8

# Long-Term Assignment of Site-Generated Traffic

Harmony Master Plan Update (LSC #220530)







LEGEND:  
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 $\frac{35}{26}$  = PM Peak Hour Traffic  
 1,000 = Average Daily Traffic

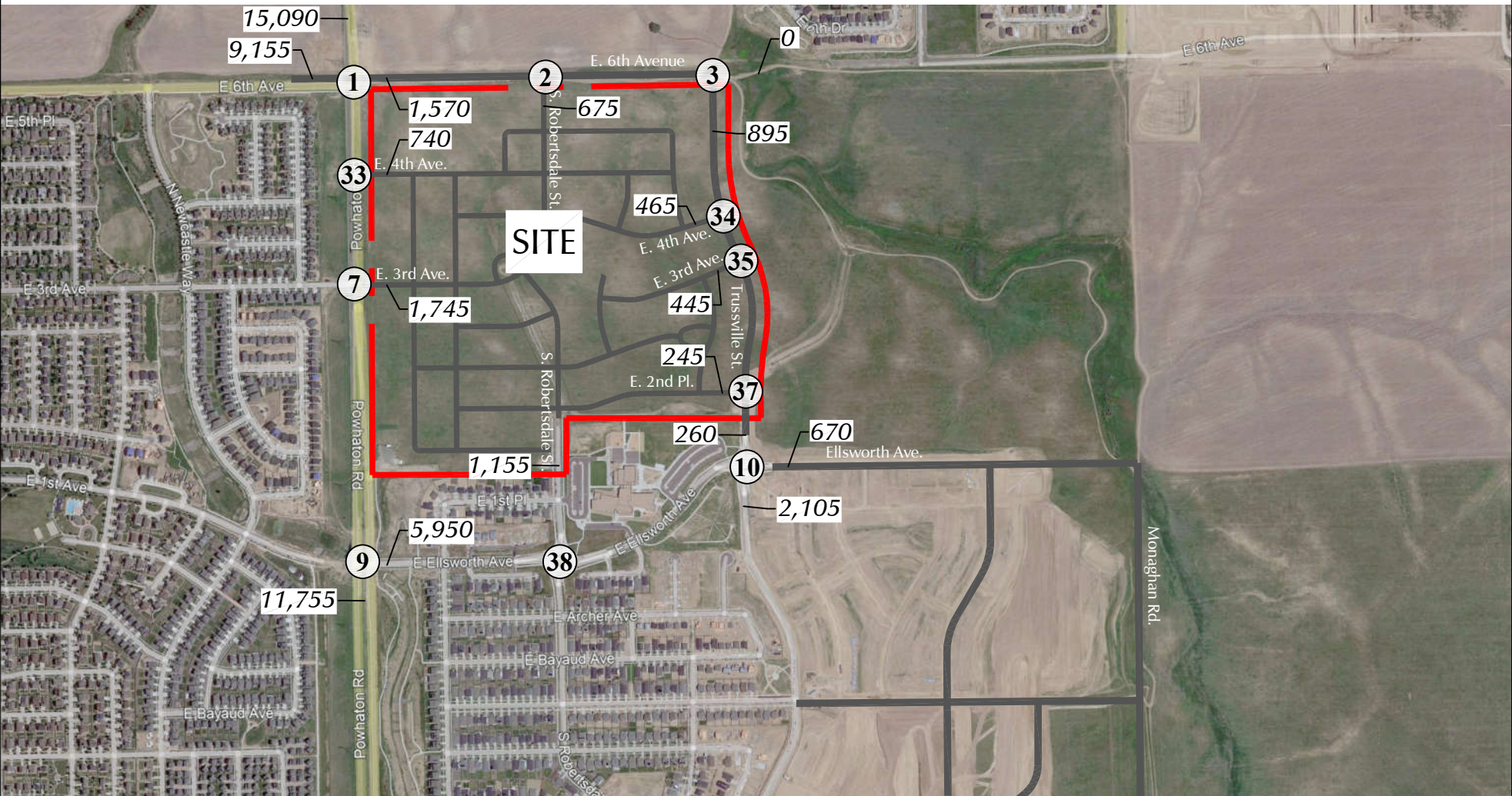
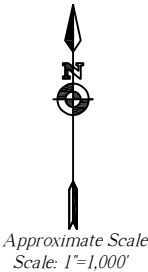


Figure 9a  
**Year 2024**  
**Total Traffic**  
 Harmony Phase 6 (LSC #220300)





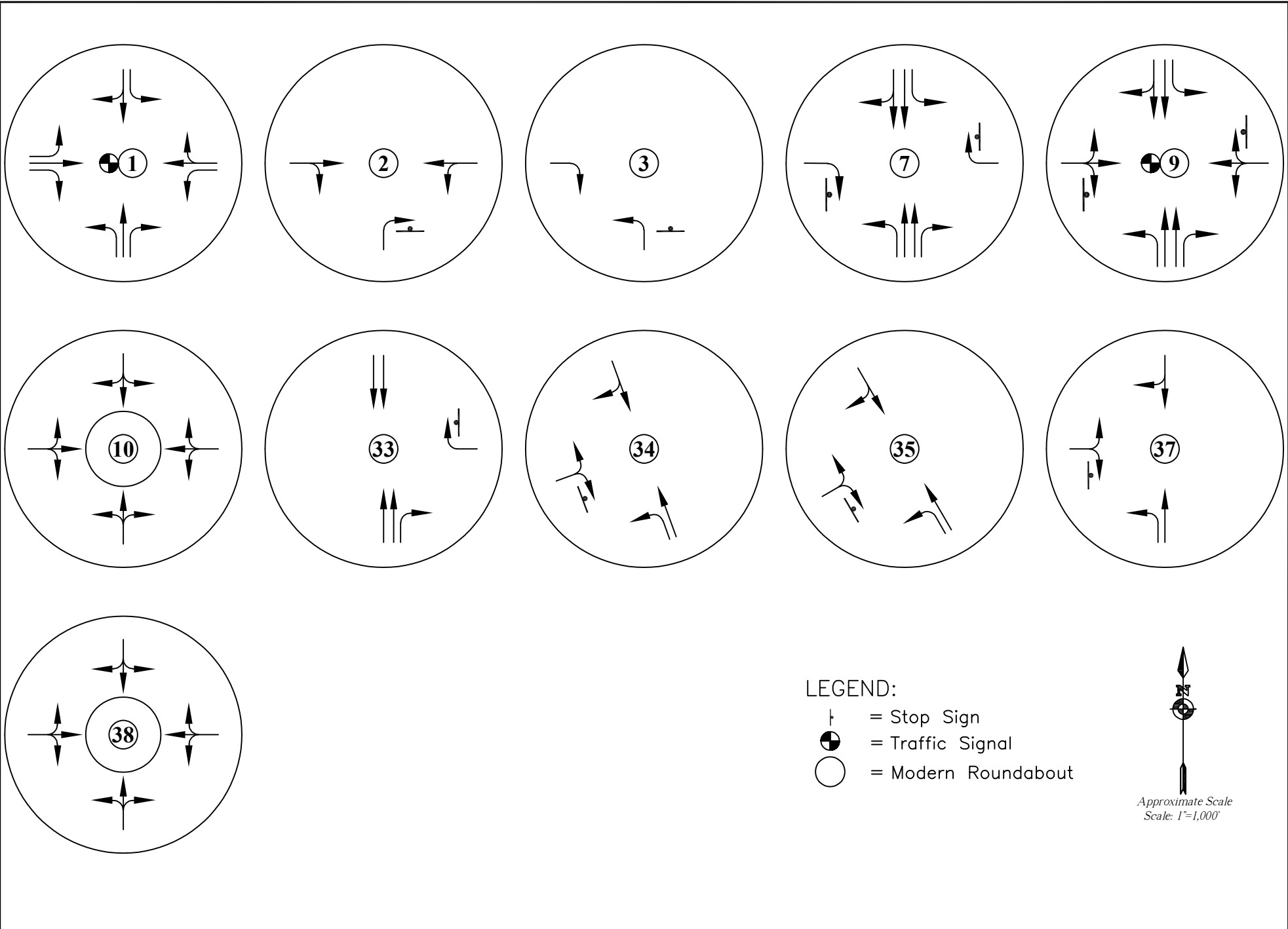
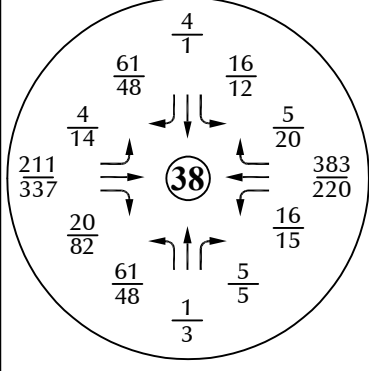
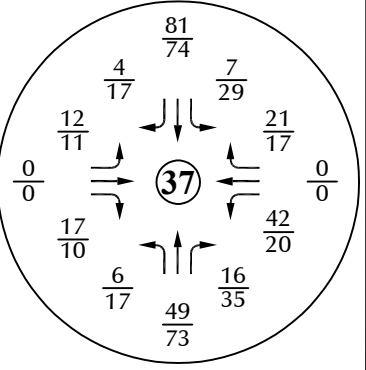
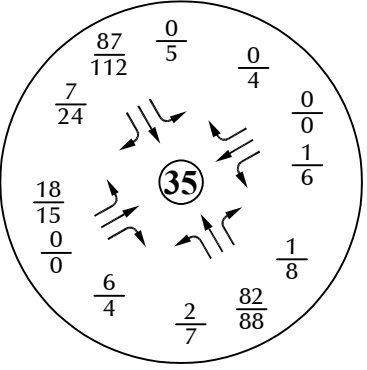
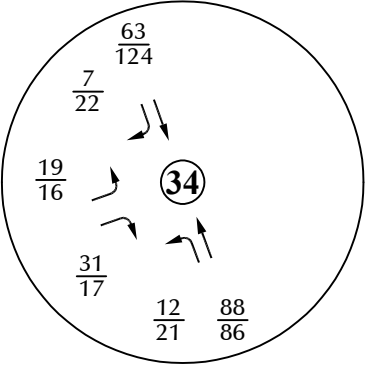
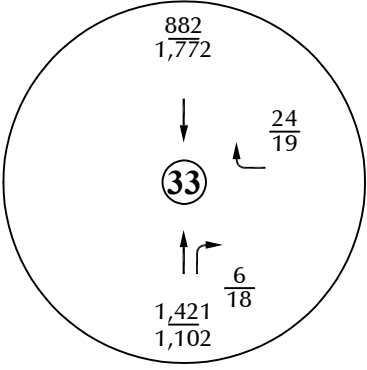
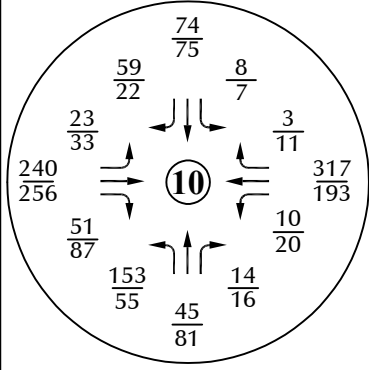
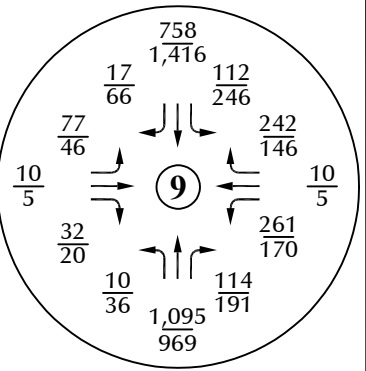
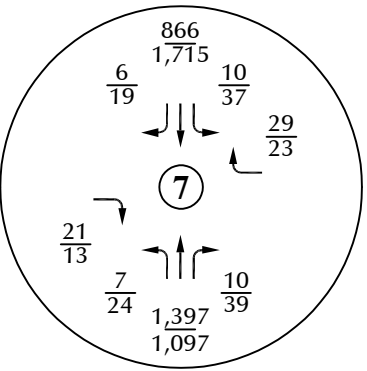
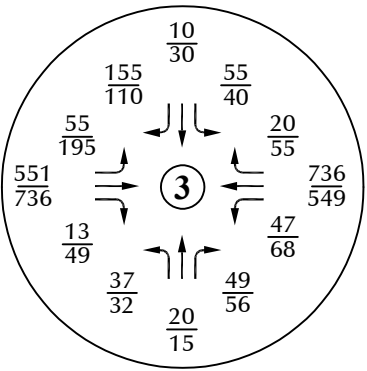
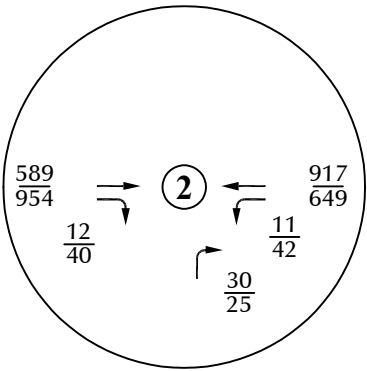
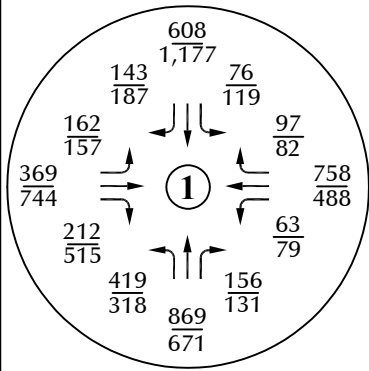


Figure 9b  
**Year 2024 Total  
Lane Geometry and Traffic Control**  
Harmony Phase 6 (LSC #220300)





LEGEND:  
 $\frac{26}{35}$  = AM Peak Hour Traffic  
 $\frac{35}{26}$  = PM Peak Hour Traffic  
 1,000 = Average Daily Traffic

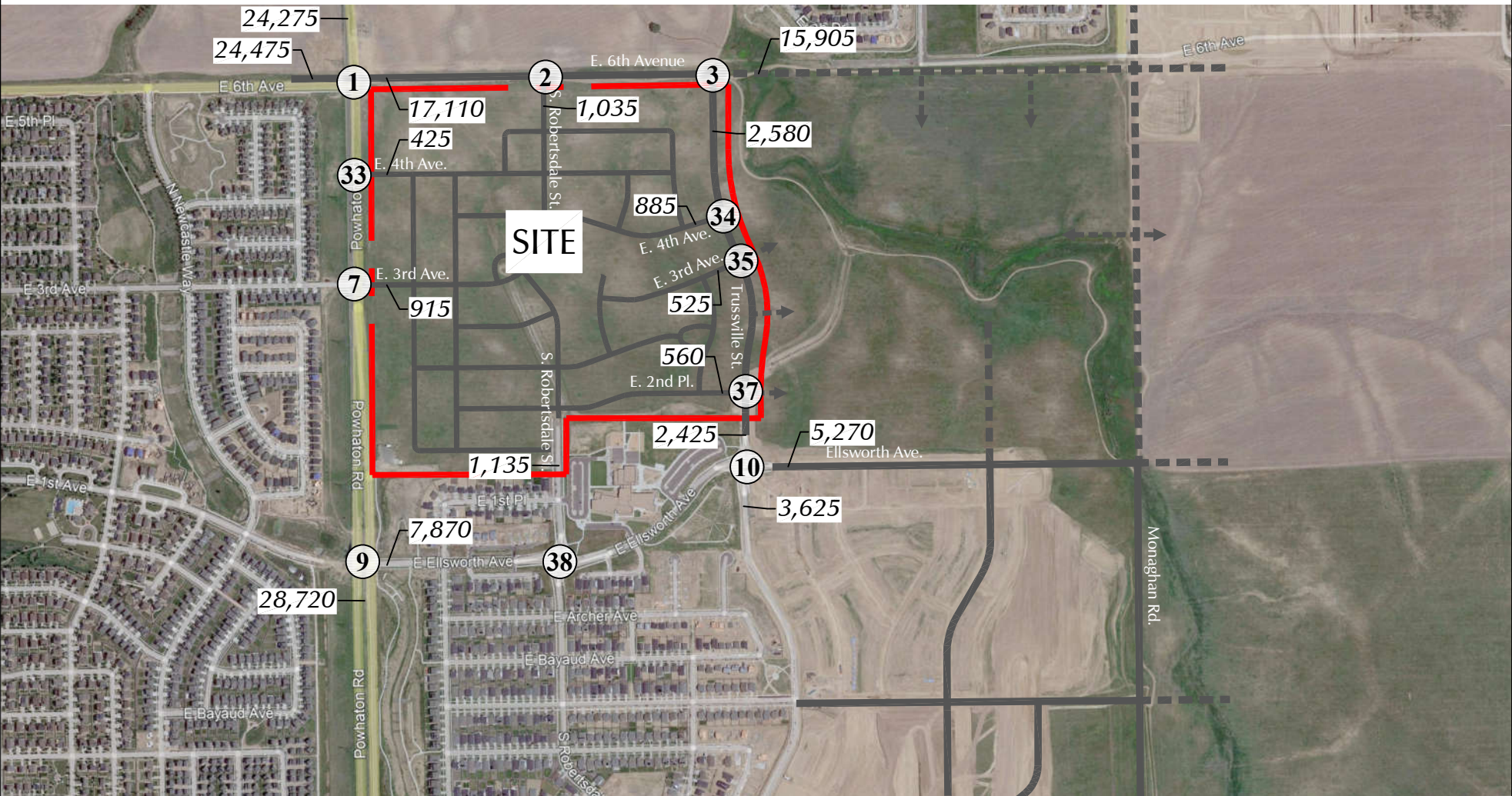
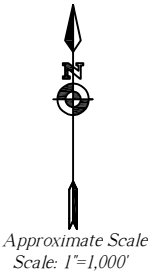
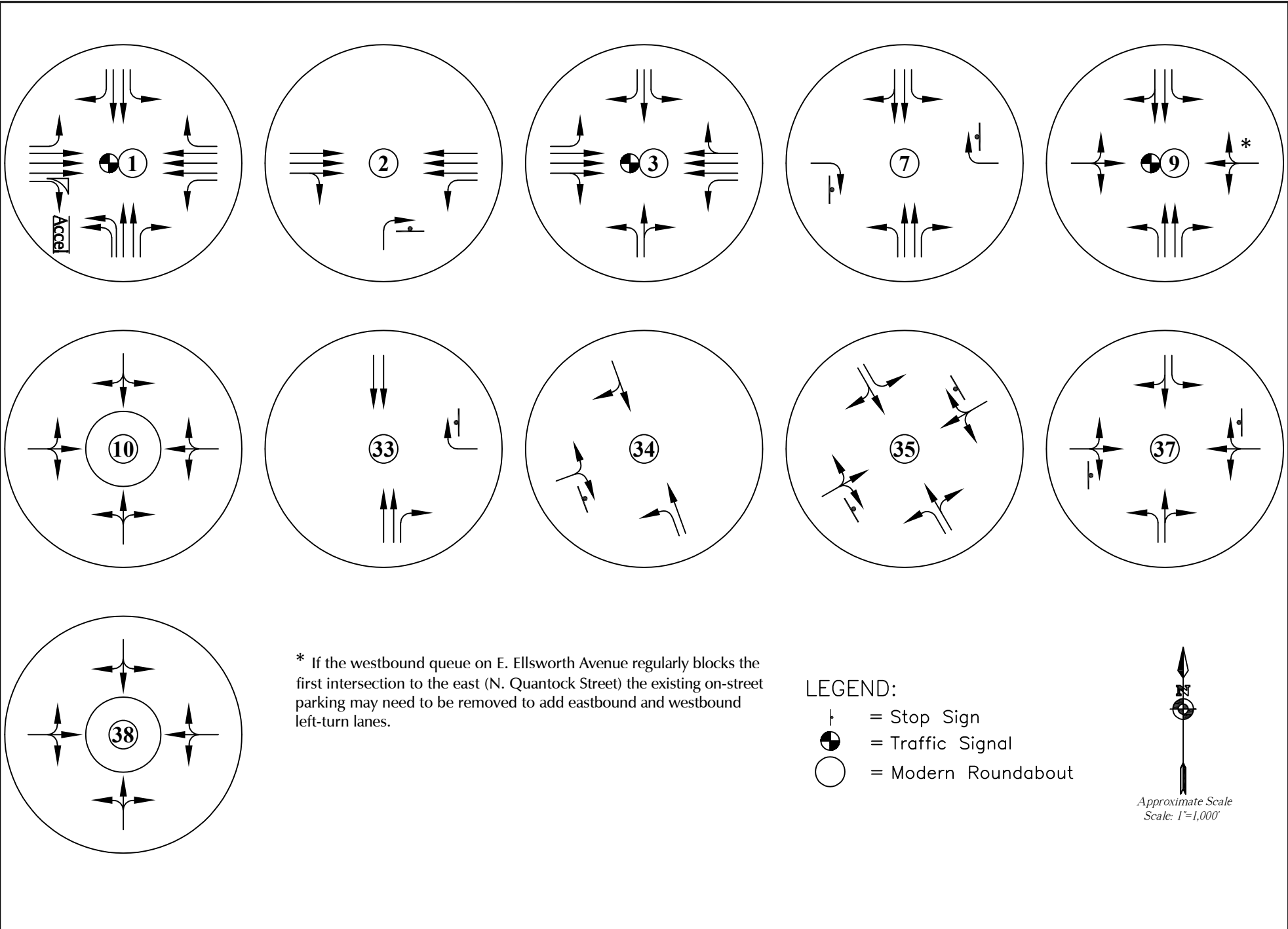


Figure 10a  
**Year 2040**  
**Total Traffic**

Harmony Phase 6 (LSC #220300)







# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER.COLORADO  
303-333-7409

N/S STREET: POWHATON RD  
E/W STREET: E. 6TH AVE  
CITY: AURORA  
COUNTY: ARAPAHOE

File Name : POWH6TH  
Site Code : 00000013  
Start Date : 6/15/2022  
Page No : 1

## Groups Printed- VEHICLES

	POWHATON RD Southbound				NO ACCESS Westbound				POWHATON RD Northbound				E. 6TH AVE Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	24	7	0	0	0	0	0	4	26	0	0	8	0	8	0	77
06:45 AM	0	34	3	0	0	0	0	0	10	26	0	0	12	0	7	0	92
Total	0	58	10	0	0	0	0	0	14	52	0	0	20	0	15	0	169
07:00 AM	0	22	7	0	1	0	0	0	7	20	0	0	5	0	8	0	70
07:15 AM	0	34	10	0	0	0	0	0	17	33	0	0	2	4	7	0	107
07:30 AM	0	22	8	0	0	0	0	0	12	32	0	0	9	2	7	0	92
07:45 AM	0	26	5	0	0	0	0	0	21	16	1	0	7	1	11	0	88
Total	0	104	30	0	1	0	0	0	57	101	1	0	23	7	33	0	357
08:00 AM	0	22	10	0	0	0	0	0	9	25	0	0	7	0	14	1	88
08:15 AM	0	19	8	0	0	0	0	0	16	18	0	0	5	1	10	0	77
Total	0	41	18	0	0	0	0	0	25	43	0	0	12	1	24	1	165
04:00 PM	0	38	16	0	0	0	0	0	7	21	0	0	17	0	14	0	113
04:15 PM	0	23	6	0	0	0	0	0	14	20	0	0	7	0	16	1	87
04:30 PM	0	38	16	0	0	0	0	0	20	28	0	0	21	0	15	0	138
04:45 PM	0	33	18	0	0	0	0	2	14	32	0	0	13	0	17	0	129
Total	0	132	56	0	0	0	0	2	55	101	0	0	58	0	62	1	467
05:00 PM	0	31	13	0	0	1	0	0	13	28	0	0	16	0	10	0	112
05:15 PM	0	41	15	0	0	0	0	0	12	24	0	0	13	0	12	0	117
05:30 PM	0	18	18	0	0	0	0	0	13	35	0	0	17	0	14	0	115
05:45 PM	0	33	14	2	0	0	0	0	10	35	0	0	12	0	14	0	120
Total	0	123	60	2	0	1	0	0	48	122	0	0	58	0	50	0	464
Grand Total	0	458	174	2	1	1	0	2	199	419	1	0	171	8	184	2	1622
Apprch %	0.0	72.2	27.4	0.3	25.0	25.0	0.0	50.0	32.1	67.7	0.2	0.0	46.8	2.2	50.4	0.5	
Total %	0.0	28.2	10.7	0.1	0.1	0.1	0.0	0.1	12.3	25.8	0.1	0.0	10.5	0.5	11.3	0.1	

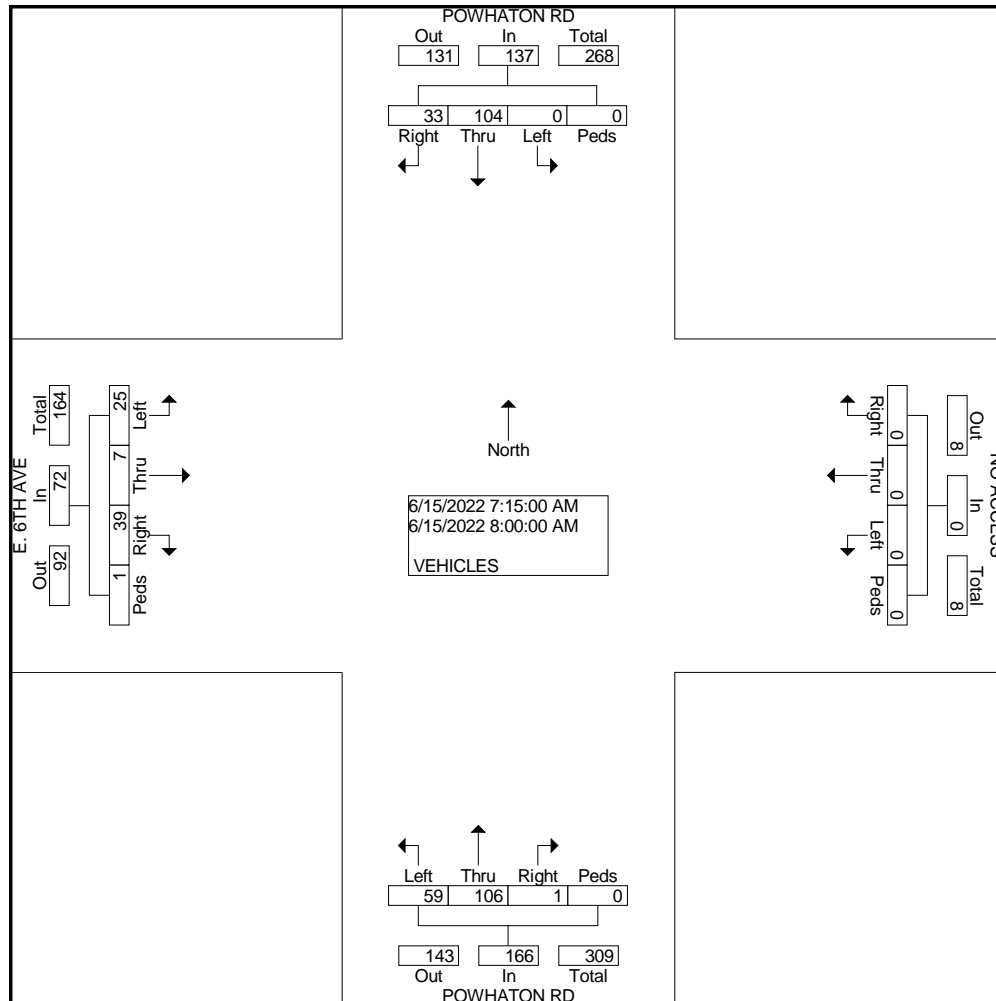
# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER.COLORADO  
303-333-7409

N/S STREET: POWHATON RD  
E/W STREET: E. 6TH AVE  
CITY: AURORA  
COUNTY: ARAPAHOE

File Name : POWH6TH  
Site Code : 00000013  
Start Date : 6/15/2022  
Page No : 2

	POWHATON RD Southbound					NO ACCESS Westbound					POWHATON RD Northbound					E. 6TH AVE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	0	104	33	0	137	0	0	0	0	0	59	106	1	0	166	25	7	39	1	72	375
Percent	0.0	75.9	24.1	0.0		0.0	0.0	0.0	0.0		35.5	63.9	0.6	0.0		34.7	9.7	54.2	1.4		
07:15																					
Volume	0	34	10	0	44	0	0	0	0	0	17	33	0	0	50	2	4	7	0	13	107
Peak Factor																					0.876
High Int.	07:15 AM					6:15:00 AM					07:15 AM					08:00 AM					
Volume	0	34	10	0	44	0	0	0	0	0	17	33	0	0	50	7	0	14	1	22	
Peak Factor																					0.818



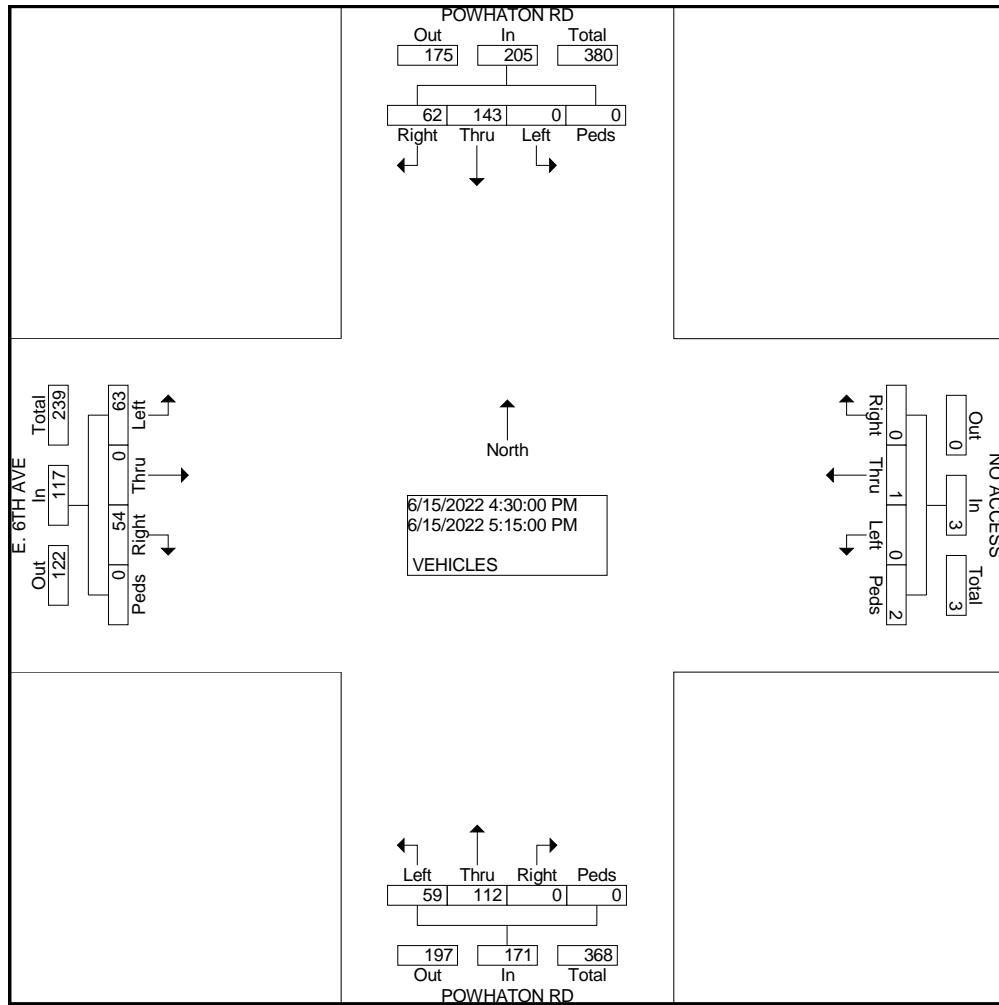
# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER.COLORADO  
303-333-7409

N/S STREET: POWHATON RD  
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CITY: AURORA  
COUNTY: ARAPAHOE

File Name : POWH6TH  
Site Code : 00000013  
Start Date : 6/15/2022  
Page No : 3

	POWHATON RD Southbound					NO ACCESS Westbound					POWHATON RD Northbound					E. 6TH AVE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	0	143	62	0	205	0	1	0	2	3	59	112	0	0	171	63	0	54	0	117	496
Percent	0.0	69.8	30.2	0.0		0.0	33.3	0.0	66.7		34.5	65.5	0.0	0.0		53.8	0.0	46.2	0.0		
04:30 Volume	0	38	16	0	54	0	0	0	0	0	20	28	0	0	48	21	0	15	0	36	138
Peak Factor																					0.899
High Int.	05:15 PM																				
Volume	0	41	15	0	56	04:45 PM 0	0	0	2	2	04:30 PM 20	28	0	0	48	04:30 PM 21	0	15	0	36	
Peak Factor					0.915					0.375					0.891					0.813	



# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER.COLORADO  
303-333-7409

N/S STREET: POWHATON RD  
E/W STREET: E. ELLSWORTH AVE  
CITY: AURORA  
COUNTY: ARAPAHOE

File Name : POWHELLSWORTH  
Site Code : 00000005  
Start Date : 6/15/2022  
Page No : 1

## Groups Printed- VEHICLES

	POWHATON RD Southbound				E. ELLSWORTH AVE Westbound				POWHATON RD Northbound				CONST ENTRANCE Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	11	21	0	1	7	0	19	0	0	13	1	0	0	0	0	0	73
06:45 AM	15	23	1	0	9	0	24	0	0	10	2	0	0	0	0	0	84
Total	26	44	1	1	16	0	43	0	0	23	3	0	0	0	0	0	157
07:00 AM	13	19	0	0	7	0	21	0	0	10	4	0	0	1	0	0	75
07:15 AM	33	16	1	1	10	0	29	0	0	19	6	0	0	0	0	0	115
07:30 AM	15	16	0	0	10	0	33	0	0	10	6	0	0	0	0	0	90
07:45 AM	16	21	0	0	12	0	28	1	0	9	2	0	0	0	0	0	89
Total	77	72	1	1	39	0	111	1	0	48	18	0	0	1	0	0	369
08:00 AM	19	19	0	0	12	0	21	0	0	13	3	0	0	0	0	0	87
08:15 AM	12	17	0	0	11	0	23	1	0	11	4	0	0	0	0	1	80
Total	31	36	0	0	23	0	44	1	0	24	7	0	0	0	0	1	167
04:00 PM	26	24	0	0	7	1	17	0	0	19	7	0	0	0	0	0	101
04:15 PM	17	28	0	0	3	0	16	0	0	19	10	0	1	0	0	0	94
04:30 PM	25	29	1	0	5	0	22	0	0	25	11	0	1	1	0	0	120
04:45 PM	29	24	0	0	9	0	24	0	0	28	12	0	0	0	0	0	126
Total	97	105	1	0	24	1	79	0	0	91	40	0	2	1	0	0	441
05:00 PM	23	18	0	0	7	0	12	0	0	27	8	0	0	0	0	0	95
05:15 PM	27	24	1	0	3	0	13	0	0	19	13	0	0	0	0	0	100
05:30 PM	22	12	0	0	6	0	20	0	0	39	11	0	0	1	0	0	111
05:45 PM	23	21	0	0	3	0	20	0	0	29	14	0	0	0	0	0	110
Total	95	75	1	0	19	0	65	0	0	114	46	0	0	1	0	0	416
Grand Total	326	332	4	2	121	1	342	2	0	300	114	0	2	3	0	1	1550
Apprch %	49.1	50.0	0.6	0.3	26.0	0.2	73.4	0.4	0.0	72.5	27.5	0.0	33.3	50.0	0.0	16.7	
Total %	21.0	21.4	0.3	0.1	7.8	0.1	22.1	0.1	0.0	19.4	7.4	0.0	0.1	0.2	0.0	0.1	

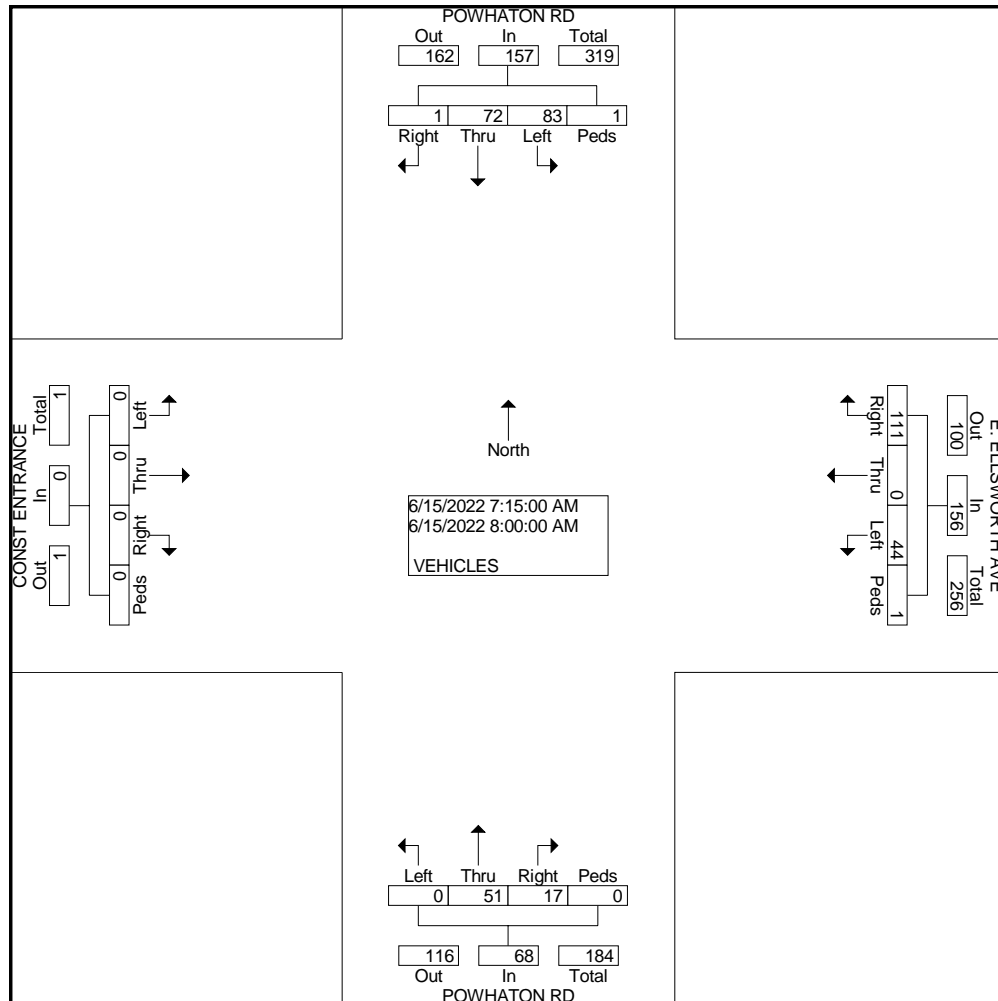
# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER.COLORADO  
303-333-7409

N/S STREET: POWHATON RD  
E/W STREET: E. ELLSWORTH AVE  
CITY: AURORA  
COUNTY: ARAPAHOE

File Name : POWHELLSWORTH  
Site Code : 00000005  
Start Date : 6/15/2022  
Page No : 2

	POWHATON RD Southbound					E. ELLSWORTH AVE Westbound					POWHATON RD Northbound					CONST ENTRANCE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 07:15 AM to 08:00 AM - Peak 1 of 1	07:15 AM																				
Intersection	07:15 AM																				
Volume	83	72	1	1	157	44	0	111	1	156	0	51	17	0	68	0	0	0	0	0	381
Percent	52.9	45.9	0.6	0.6		28.2	0.0	71.2	0.6		0.0	75.0	25.0	0.0		0.0	0.0	0.0	0.0		
07:15 Volume	33	16	1	1	51	10	0	29	0	39	0	19	6	0	25	0	0	0	0	0	115
Peak Factor																					0.828
High Int. Volume	07:15 AM					07:30 AM					07:15 AM										
Peak Factor	33	16	1	1	51	10	0	33	0	43	0	19	6	0	25						
	0.77					0.90					0.68										
	0					7					0										



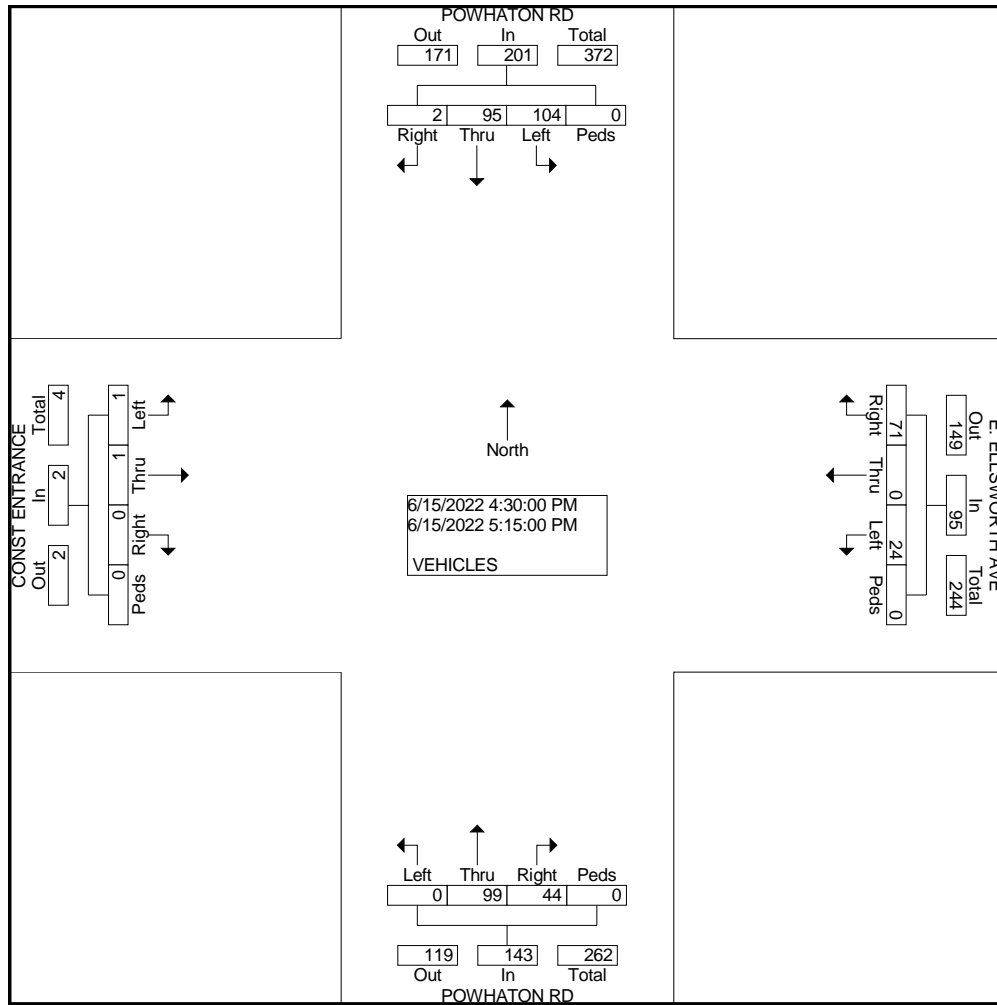
# COUNTER MEASURES INC.

1889 YORK STREET  
DENVER.COLORADO  
303-333-7409

N/S STREET: POWHATON RD  
E/W STREET: E. ELLSWORTH AVE  
CITY: AURORA  
COUNTY: ARAPAHOE

File Name : POWHELLSWORTH  
Site Code : 00000005  
Start Date : 6/15/2022  
Page No : 3

	POWHATON RD Southbound					E. ELLSWORTH AVE Westbound					POWHATON RD Northbound					CONST ENTRANCE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	104	95	2	0	201	24	0	71	0	95	0	99	44	0	143	1	1	0	0	2	441
Percent	51.7	47.3	1.0	0.0		25.3	0.0	74.7	0.0		0.0	69.2	30.8	0.0		50.0	50.0	0.0	0.0		
04:45 Volume	29	24	0	0	53	9	0	24	0	33	0	28	12	0	40	0	0	0	0	0	126
Peak Factor																					0.875
High Int. Volume	04:30 PM					04:45 PM					04:45 PM					04:30 PM					
Peak Factor	25	29	1	0	55	9	0	24	0	33	0	28	12	0	40	1	1	0	0	2	
	0.914					0.720					0.894					0.250					



Location: S. POWHATON RD S-O ALAMEDA AVE  
City: AURORA  
County: ARAPAHOE  
Direction: NORTH/SOUTH

**COUNTER MEASURES INC.**  
**1889 YORK STREET**  
**DENVER, COLORADO 80206**  
**303-333-7409**

Site Code: 222808  
Station ID: 222808

Start Time	29-Mar-22 Tue	NORTH	SOUTH							Total
12:00 AM		6	13							19
01:00		3	5							8
02:00		7	4							11
03:00		4	5							9
04:00		15	24							39
05:00		40	43							83
06:00		69	41							110
07:00		<b>92</b>	<b>89</b>							<b>181</b>
08:00		87	75							162
09:00		72	74							146
10:00		71	79							150
11:00		78	89							167
12:00 PM		81	101							182
01:00		87	93							180
02:00		93	108							201
03:00		125	146							271
04:00		138	169							307
05:00		<b>146</b>	<b>192</b>							<b>338</b>
06:00		93	116							209
07:00		56	79							135
08:00		44	67							111
09:00		41	43							84
10:00		35	41							76
11:00		16	14							30
Total		1499	1710							3209
Percent		46.7%	53.3%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	92	89	-	-	-	-	-	-	181
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	146	192	-	-	-	-	-	-	338
Grand Total		1499	1710							3209
Percent		46.7%	53.3%							
ADT		ADT 3,130	AADT 3,130							



## LEVEL OF SERVICE DEFINITIONS

From *Highway Capacity Manual*, Transportation Research Board, 2016, 6th Edition

### SIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

<b><u>LOS</u></b>	<b><u>Average Vehicle Delay</u> sec/vehicle</b>	<b><u>Operational Characteristics</u></b>
<b>A</b>	<10 seconds	Describes operations with low control delay, up to 10 sec/veh. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
<b>B</b>	10 to 20 seconds	Describes operations with control delay greater than 10 seconds and up to 20 sec/veh. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.
<b>C</b>	20 to 35 seconds	Describes operations with control delay greater than 20 and up to 35 sec/veh. These higher delays may result from only fair progression, longer cycle length, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
<b>D</b>	35 to 55 seconds	Describes operations with control delay greater than 35 and up to 55 sec/veh. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
<b>E</b>	55 to 80 seconds	Describes operations with control delay greater than 55 and up to 80 sec/veh. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.
<b>F</b>	>80 seconds	Describes operations with control delay in excess of 80 sec/veh. This level, considered unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

## LEVEL OF SERVICE DEFINITIONS

From *Highway Capacity Manual*, Transportation Research Board, 2016, 6th Edition







### UNSIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

Applicable to Two-Way Stop Control, All-Way Stop Control, and Roundabouts

LOS	Average Vehicle Control Delay	Operational Characteristics
A	<10 seconds	Normally, vehicles on the stop-controlled approach only have to wait up to 10 seconds before being able to clear the intersection. Left-turning vehicles on the uncontrolled street do not have to wait to make their turn.
B	10 to 15 seconds	Vehicles on the stop-controlled approach will experience delays before being able to clear the intersection. <u>The delay could be up to 15 seconds.</u> Left-turning vehicles on the uncontrolled street may have to wait to make their turn.
C	15 to 25 seconds	Vehicles on the stop-controlled approach can expect delays in the range of 15 to 25 seconds before clearing the intersection. Motorists may begin to take chances due to the long delays, thereby posing a safety risk to through traffic. <u>Left-turning vehicles on the uncontrolled street will now be required to wait to make their turn causing a queue to be created in the turn lane.</u>
D	25 to 35 seconds	<u>This is the point at which a traffic signal may be warranted for this intersection.</u> The delays for the stop-controlled intersection are not considered to be excessive. The length of the queue may begin to block other public and private access points.
E	35 to 50 seconds	The delays for all critical traffic movements are considered to be unacceptable. The length of the queues for the stop-controlled approaches as well as the left-turn movements are extremely long. <u>There is a high probability that this intersection will meet traffic signal warrants.</u> The ability to install a traffic signal is affected by the location of other existing traffic signals. Consideration may be given to restricting the accesses by eliminating the left-turn movements from and to the stop-controlled approach.
F	>50 seconds	The delay for the critical traffic movements are probably in excess of 100 seconds. The length of the queues are extremely long. Motorists are selecting alternative routes due to the long delays. <u>The only remedy for these long delays is installing a traffic signal or restricting the accesses.</u> The potential for accidents at this intersection are extremely high due to motorist taking more risky chances. If the median permits, motorists begin making two-stage left-turns.

HCM 6th TWSC  
1: S. Powhaton Road & E 6th Avenue

Existing Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	39	59	106	104	33
Future Vol, veh/h	25	39	59	106	104	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	215	0	285	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	44	67	120	118	38
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	391	137	156	0	-	0
Stage 1	137	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	613	911	1424	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	584	911	1424	-	-	-
Mov Cap-2 Maneuver	584	-	-	-	-	-
Stage 1	848	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.1	2.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1424	-	584	911	-	-
HCM Lane V/C Ratio	0.047	-	0.049	0.049	-	-
HCM Control Delay (s)	7.7	-	11.5	9.2	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	0.2	-	-

HCM 6th TWSC  
9: S. Powhaton Rd & E. 1st Ave/E. Ellsworth Ave

Existing Traffic  
AM Peak Hour

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	44	0	111	0	51	17	83	72	0
Future Vol, veh/h	0	0	0	44	0	111	0	51	17	83	72	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	350	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	53	0	134	0	61	20	100	87	0







Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	318	368	44	315	358	41	87	0	0	81	0	0
Stage 1	287	287	-	71	71	-	-	-	-	-	-	-
Stage 2	31	81	-	244	287	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	611	560	1017	614	567	1021	1507	-	-	1515	-	-
Stage 1	696	673	-	931	835	-	-	-	-	-	-	-
Stage 2	981	827	-	738	673	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	504	523	1017	583	530	1021	1507	-	-	1515	-	-
Mov Cap-2 Maneuver	504	523	-	583	530	-	-	-	-	-	-	-
Stage 1	696	629	-	931	835	-	-	-	-	-	-	-
Stage 2	853	827	-	689	629	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		10.5		0		4	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1507	-	-	-	842	1515	-
HCM Lane V/C Ratio	-	-	-	-	0.222	0.066	-
HCM Control Delay (s)	0	-	-	0	10.5	7.5	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.8	0.2	-

HCM 6th TWSC  
1: S. Powhaton Road & E 6th Avenue

Existing Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	63	54	59	112	143	62
Future Vol, veh/h	63	54	59	112	143	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	215	0	285	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	60	66	124	159	69

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	450	194	228	0	-	0
Stage 1	194	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	567	847	1340	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	787	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	539	847	1340	-	-	-
Mov Cap-2 Maneuver	539	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	787	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	2.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1340	-	539	847	-	-
HCM Lane V/C Ratio	0.049	-	0.13	0.071	-	-
HCM Control Delay (s)	7.8	-	12.7	9.6	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	0.2	-	-

HCM 6th TWSC  
9: S. Powhaton Rd & E. 1st Ave/E. Ellsworth Ave

Existing Traffic  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	24	0	71	0	99	44	104	95	0
Future Vol, veh/h	0	0	0	24	0	71	0	99	44	104	95	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	350	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	27	0	81	0	113	50	118	108	0







Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	401	507	54	428	482	82	108	0	0	163	0	0
Stage 1	344	344	-	138	138	-	-	-	-	-	-	-
Stage 2	57	163	-	290	344	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	534	467	1002	511	482	961	1480	-	-	1413	-	-
Stage 1	645	635	-	851	781	-	-	-	-	-	-	-
Stage 2	948	762	-	694	635	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	458	428	1002	478	442	961	1480	-	-	1413	-	-
Mov Cap-2 Maneuver	458	428	-	478	442	-	-	-	-	-	-	-
Stage 1	645	582	-	851	781	-	-	-	-	-	-	-
Stage 2	868	762	-	636	582	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		10.5		0		4.1	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1480	-	-	-	766	1413	-
HCM Lane V/C Ratio	-	-	-	-	0.141	0.084	-
HCM Control Delay (s)	0	-	-	0	10.5	7.8	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.3	-











HCM 6th TWSC  
1: S. Powhaton Road & E 6th Avenue

2024 Background Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	8.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	90	94	195	491	261	87
Future Vol, veh/h	90	94	195	491	261	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	215	0	285	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	107	222	558	297	99
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1349	347	396	0	-	0
Stage 1	347	-	-	-	-	-
Stage 2	1002	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	166	696	1163	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	134	696	1163	-	-	-
Mov Cap-2 Maneuver	134	-	-	-	-	-
Stage 1	579	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	48.9	2.5		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1163	-	134	696	-	-
HCM Lane V/C Ratio	0.191	-	0.763	0.153	-	-
HCM Control Delay (s)	8.8	-	88.4	11.1	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	4.5	0.5	-	-

# Timings 1: S. Powhatan Road & E 6th Avenue

2024 Background Traffic  
AM Peak Hour

					
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	90	94	195	491	261
Future Volume (vph)	90	94	195	491	261
Turn Type	Prot	Perm	pm+pt	NA	NA
Protected Phases	4		5	2	6
Permitted Phases		4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	15.0	15.0
Minimum Split (s)	23.0	23.0	10.0	23.0	22.5
Total Split (s)	30.0	30.0	12.0	90.0	78.0
Total Split (%)	25.0%	25.0%	10.0%	75.0%	65.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	None	None	None	Max	Max
Act Effect Green (s)	12.1	12.1	85.0	85.0	74.0
Actuated g/C Ratio	0.11	0.11	0.79	0.79	0.69
v/c Ratio	0.51	0.39	0.30	0.38	0.32
Control Delay	54.1	12.8	3.9	4.3	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	12.8	3.9	4.3	7.1
LOS	D	B	A	A	A
Approach Delay	32.9			4.2	7.1
Approach LOS	C			A	A

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 107.1

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 9.4

Intersection LOS: A

Intersection Capacity Utilization 49.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: S. Powhatan Road & E 6th Avenue





# HCM 6th Signalized Intersection Summary

## 1: S. Powhaton Road & E 6th Avenue

2024 Background Traffic  
AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	94	195	491	261	87
Future Volume (veh/h)	90	94	195	491	261	87
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	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	102	107	222	558	297	99
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	169	151	781	1514	954	318
Arrive On Green	0.10	0.10	0.05	0.81	0.71	0.71
Sat Flow, veh/h	1781	1585	1781	1870	1342	447
Grp Volume(v), veh/h	102	107	222	558	0	396
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	0	1790
Q Serve(g_s), s	5.8	6.9	3.3	8.5	0.0	8.6
Cycle Q Clear(g_c), s	5.8	6.9	3.3	8.5	0.0	8.6
Prop In Lane	1.00	1.00	1.00			0.25
Lane Grp Cap(c), veh/h	169	151	781	1514	0	1272
V/C Ratio(X)	0.60	0.71	0.28	0.37	0.00	0.31
Avail Cap(c_a), veh/h	424	377	809	1514	0	1272
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	0.00	1.00
Uniform Delay (d), s/veh	45.6	46.1	3.6	2.7	0.0	5.6
Incr Delay (d2), s/veh	3.4	6.0	0.2	0.7	0.0	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	2.6	6.2	0.8	1.9	0.0	2.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.0	52.1	3.8	3.4	0.0	6.3
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	209			780	396	
Approach Delay, s/veh	50.6			3.5	6.3	
Approach LOS	D			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	90.0			15.0	10.4	79.6
Change Period (Y+Rc), s	5.0			5.0	5.0	* 5
Max Green Setting (Gmax), s	85.0			25.0	7.0	* 74
Max Q Clear Time (g_c+I1), s	10.5			8.9	5.3	10.6
Green Ext Time (p_c), s	3.7			0.5	0.1	2.5

### Intersection Summary

HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

### Notes

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

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↗↖	
Traffic Vol, veh/h	0	21	7	686	349	6
Future Vol, veh/h	0	21	7	686	349	6
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	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	8	746	379	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	193	386	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.93	4.13	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	0	817	1171	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	817	1171	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.5	0.1		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1171	-	817	-	-	
HCM Lane V/C Ratio	0.006	-	0.028	-	-	
HCM Control Delay (s)	8.1	0	9.5	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC  
9: S. Powhaton Rd & E. 1st Ave/E. Ellsworth Ave

2024 Background Traffic  
AM Peak Hour

Intersection												
Int Delay, s/veh	18.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	77	10	32	53	10	234	10	382	19	125	228	17
Future Vol, veh/h	77	10	32	53	10	234	10	382	19	125	228	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	350	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	93	12	39	64	12	282	12	460	23	151	275	20

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	847	1094	148	942	1093	242	295	0	0	483	0	0
Stage 1	587	587	-	496	496	-	-	-	-	-	-	-
Stage 2	260	507	-	446	597	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	255	213	872	218	213	759	1263	-	-	1076	-	-
Stage 1	463	495	-	524	544	-	-	-	-	-	-	-
Stage 2	722	538	-	561	490	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	135	181	872	175	181	759	1263	-	-	1076	-	-
Mov Cap-2 Maneuver	135	181	-	175	181	-	-	-	-	-	-	-
Stage 1	458	426	-	519	539	-	-	-	-	-	-	-
Stage 2	439	533	-	448	421	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	75.5		38.5		0.2		3	
HCM LOS	F		E					







Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1263	-	-	180 446	1076	-	-
HCM Lane V/C Ratio	0.01	-	-	0.797 0.802	0.14	-	-
HCM Control Delay (s)	7.9	-	-	75.5 38.5	8.9	-	-
HCM Lane LOS	A	-	-	F E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	5.4 7.3	0.5	-	-

Intersection			
Intersection Delay, s/veh	3.3		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	56	45	126
Demand Flow Rate, veh/h	57	46	129
Vehicles Circulating, veh/h	0	129	13
Vehicles Exiting, veh/h	175	13	44
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.0	3.3	3.5
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	57	46	129
Cap Entry Lane, veh/h	1380	1210	1362
Entry HV Adj Factor	0.978	0.980	0.977
Flow Entry, veh/h	56	45	126
Cap Entry, veh/h	1349	1186	1330
V/C Ratio	0.041	0.038	0.095
Control Delay, s/veh	3.0	3.3	3.5
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection				
Intersection Delay, s/veh	4.1			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	158	233	90	20
Demand Flow Rate, veh/h	160	237	91	20
Vehicles Circulating, veh/h	17	84	143	298
Vehicles Exiting, veh/h	301	150	34	23
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.6	4.5	3.7	3.7
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	160	237	91	20
Cap Entry Lane, veh/h	1356	1267	1193	1018
Entry HV Adj Factor	0.985	0.982	0.989	0.999
Flow Entry, veh/h	158	233	90	20
Cap Entry, veh/h	1335	1244	1179	1017
V/C Ratio	0.118	0.187	0.076	0.020
Control Delay, s/veh	3.6	4.5	3.7	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	1	0	0

HCM 6th TWSC  
1: S. Powhaton Road & E 6th Avenue











2024 Background Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	69.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	184	203	162	404	580	187
Future Vol, veh/h	184	203	162	404	580	187
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	215	0	285	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	204	226	180	449	644	208
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1557	748	852	0	-	0
Stage 1	748	-	-	-	-	-
Stage 2	809	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 124	412	787	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 96	412	787	-	-	-
Mov Cap-2 Maneuver	~ 96	-	-	-	-	-
Stage 1	361	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s\$	304.3	3.1		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	787	-	96	412	-	-
HCM Lane V/C Ratio	0.229	-	2.13	0.547	-	-
HCM Control Delay (s)	10.9	-	\$ 613.7	23.8	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.9	-	17.9	3.2	-	-
Notes						
-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

# Timings

## 1: S. Powhaton Road & E 6th Avenue

2024 Background Traffic  
PM Peak Hour

					
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	184	203	162	404	580
Future Volume (vph)	184	203	162	404	580
Turn Type	Prot	Perm	pm+pt	NA	NA
Protected Phases	4		5	2	6
Permitted Phases		4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	15.0	15.0
Minimum Split (s)	25.0	25.0	10.0	23.0	23.0
Total Split (s)	35.0	35.0	12.0	85.0	73.0
Total Split (%)	29.2%	29.2%	10.0%	70.8%	60.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	None	None	None	Max	Max
Act Effect Green (s)	17.5	17.5	80.2	80.2	68.1
Actuated g/C Ratio	0.16	0.16	0.74	0.74	0.63
v/c Ratio	0.71	0.51	0.53	0.32	0.74
Control Delay	56.5	9.3	10.4	5.9	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	9.3	10.4	5.9	19.3
LOS	E	A	B	A	B
Approach Delay	31.7			7.2	19.3
Approach LOS	C			A	B

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 107.7  
 Natural Cycle: 80  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 18.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 73.6%  
 ICU Level of Service D  
 Analysis Period (min) 15













Splits and Phases: 1: S. Powhaton Road & E 6th Avenue



# HCM 6th Signalized Intersection Summary

## 1: S. Powhaton Road & E 6th Avenue

2024 Background Traffic  
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	184	203	162	404	580	187
Future Volume (veh/h)	184	203	162	404	580	187
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	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	204	226	180	449	644	208
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	298	265	364	1385	870	281
Arrive On Green	0.17	0.17	0.05	0.74	0.64	0.64
Sat Flow, veh/h	1781	1585	1781	1870	1354	437
Grp Volume(v), veh/h	204	226	180	449	0	852
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	0	1792
Q Serve(g_s), s	11.6	15.0	3.5	8.9	0.0	35.0
Cycle Q Clear(g_c), s	11.6	15.0	3.5	8.9	0.0	35.0
Prop In Lane	1.00	1.00	1.00			0.24
Lane Grp Cap(c), veh/h	298	265	364	1385	0	1152
V/C Ratio(X)	0.68	0.85	0.49	0.32	0.00	0.74
Avail Cap(c_a), veh/h	494	440	388	1385	0	1152
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	0.00	1.00
Uniform Delay (d), s/veh	42.3	43.7	13.7	4.8	0.0	13.1
Incr Delay (d2), s/veh	2.8	8.3	1.0	0.6	0.0	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	13.0	1.8	2.7	0.0	13.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.1	52.0	14.8	5.4	0.0	17.4
LnGrp LOS	D	D	B	A	A	B
Approach Vol, veh/h	430			629	852	
Approach Delay, s/veh	48.7			8.1	17.4	
Approach LOS	D			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	85.0			23.1	10.5	74.5
Change Period (Y+Rc), s	5.0			5.0	5.0	5.0
Max Green Setting (Gmax), s	80.0			30.0	7.0	68.0
Max Q Clear Time (g_c+I1), s	10.9			17.0	5.5	37.0
Green Ext Time (p_c), s	2.8			1.1	0.1	6.8
Intersection Summary						
HCM 6th Ctrl Delay			21.4			
HCM 6th LOS			C			



Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↗↖	
Traffic Vol, veh/h	0	13	24	566	764	19
Future Vol, veh/h	0	13	24	566	764	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	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	26	615	830	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	426	851	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.93	4.13	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	0	578	785	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	578	785	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.4	0.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	785	-	578	-	-	
HCM Lane V/C Ratio	0.033	-	0.024	-	-	
HCM Control Delay (s)	9.7	0	11.4	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

HCM 6th TWSC  
9: S. Powhaton Rd & E. 1st Ave/E. Ellsworth Ave

2024 Background Traffic  
PM Peak Hour

Intersection												
Int Delay, s/veh	19.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	46	5	20	29	5	153	36	391	52	243	468	66
Future Vol, veh/h	46	5	20	29	5	153	36	391	52	243	468	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	350	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	52	6	23	33	6	174	41	444	59	276	532	75

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1429	1707	304	1377	1715	252	607	0	0	503	0	0
Stage 1	1122	1122	-	556	556	-	-	-	-	-	-	-
Stage 2	307	585	-	821	1159	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	95	90	692	104	89	748	967	-	-	1058	-	-
Stage 1	219	279	-	483	511	-	-	-	-	-	-	-
Stage 2	678	496	-	335	268	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	53	64	692	73	63	748	967	-	-	1058	-	-
Mov Cap-2 Maneuver	53	64	-	73	63	-	-	-	-	-	-	-
Stage 1	210	206	-	463	490	-	-	-	-	-	-	-
Stage 2	493	475	-	233	198	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	236.4		51.6		0.7		3	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	967	-	-	73	275	1058	-
HCM Lane V/C Ratio	0.042	-	-	1.105	0.773	0.261	-
HCM Control Delay (s)	8.9	-	-	236.4	51.6	9.6	-
HCM Lane LOS	A	-	-	F	F	A	-
HCM 95th %tile Q(veh)	0.1	-	-	6	5.8	1	-





















Intersection			
Intersection Delay, s/veh	3.6		
Intersection LOS	A		
Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	188	28	85
Demand Flow Rate, veh/h	192	29	87
Vehicles Circulating, veh/h	0	87	46
Vehicles Exiting, veh/h	116	46	146
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.8	3.1	3.3
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	192	29	87
Cap Entry Lane, veh/h	1380	1263	1317
Entry HV Adj Factor	0.980	0.980	0.977
Flow Entry, veh/h	188	28	85
Cap Entry, veh/h	1352	1238	1286
V/C Ratio	0.139	0.023	0.066
Control Delay, s/veh	3.8	3.1	3.3
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Intersection				
Intersection Delay, s/veh 4.3				
Intersection LOS A				
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	316	135	66	10
Demand Flow Rate, veh/h	322	137	67	10
Vehicles Circulating, veh/h	14	69	221	184
Vehicles Exiting, veh/h	180	219	115	22
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.7	3.7	3.8	3.2
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	322	137	67	10
Cap Entry Lane, veh/h	1360	1286	1101	1144
Entry HV Adj Factor	0.981	0.984	0.985	0.998
Flow Entry, veh/h	316	135	66	10
Cap Entry, veh/h	1335	1265	1085	1142
V/C Ratio	0.237	0.107	0.061	0.009
Control Delay, s/veh	4.7	3.7	3.8	3.2
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0



Timings  
1: S. Powhaton Rd & E 6th Avenue

2024 Total Traffic  
AM Peak Hour

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	90	20	104	1	26	251	548	5	13	274
Future Volume (vph)	90	20	104	1	26	251	548	5	13	274
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	4	4	4	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	23.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	12.0	48.0	48.0	12.0	48.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	13.3%	53.3%	53.3%	13.3%	53.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effect Green (s)	9.6	9.6	9.6	9.5	9.5	30.5	31.3	31.3	24.0	17.8
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.64	0.65	0.65	0.50	0.37
v/c Ratio	0.36	0.06	0.28	0.00	0.12	0.45	0.49	0.00	0.03	0.58
Control Delay	24.2	20.1	7.4	20.0	15.9	7.5	9.6	0.0	4.8	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	20.1	7.4	20.0	15.9	7.5	9.6	0.0	4.8	15.6
LOS	C	C	A	B	B	A	A	A	A	B
Approach Delay		15.7			16.0		8.9			15.3
Approach LOS		B			B		A			B

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 47.9

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 11.8





Intersection LOS: B

Intersection Capacity Utilization 57.8%

ICU Level of Service B

Analysis Period (min) 15
























Splits and Phases: 1: S. Powhaton Rd & E 6th Avenue

		
Ø1	Ø2	Ø4
12 s	48 s	30 s
		
Ø5	Ø6	Ø8
12 s	48 s	30 s

# HCM 6th Signalized Intersection Summary




## 1: S. Powhaton Rd & E 6th Avenue

2024 Total Traffic  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	20	104	1	26	14	251	548	5	13	274	87
Future Volume (veh/h)	90	20	104	1	26	14	251	548	5	13	274	87
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	22	113	1	28	15	273	596	5	14	298	95
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	365	281	238	384	172	92	560	818	693	364	430	137
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.44	0.44	0.02	0.32	0.32
Sat Flow, veh/h	1364	1870	1585	1390	1146	614	1781	1870	1585	1781	1359	433
Grp Volume(v), veh/h	98	22	113	1	0	43	273	596	5	14	0	393
Grp Sat Flow(s),veh/h/ln	1364	1870	1585	1390	0	1760	1781	1870	1585	1781	0	1792
Q Serve(g_s), s	2.6	0.4	2.5	0.0	0.0	0.8	3.5	10.0	0.1	0.2	0.0	7.3
Cycle Q Clear(g_c), s	3.4	0.4	2.5	0.4	0.0	0.8	3.5	10.0	0.1	0.2	0.0	7.3
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	365	281	238	384	0	264	560	818	693	364	0	567
V/C Ratio(X)	0.27	0.08	0.48	0.00	0.00	0.16	0.49	0.73	0.01	0.04	0.00	0.69
Avail Cap(c_a), veh/h	1057	1230	1043	1089	0	1158	641	2116	1793	660	0	2028
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.5	13.9	14.8	14.1	0.0	14.1	7.1	8.8	6.0	8.9	0.0	11.4
Incr Delay (d2), s/veh	0.4	0.1	1.5	0.0	0.0	0.3	0.7	1.3	0.0	0.0	0.0	1.5
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	0.6	0.1	0.8	0.0	0.0	0.3	0.9	3.0	0.0	0.1	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.9	14.0	16.3	14.1	0.0	14.4	7.8	10.1	6.0	8.9	0.0	12.9
LnGrp LOS	B	B	B	B	A	B	A	B	A	A	A	B
Approach Vol, veh/h	233			44			874			407		
Approach Delay, s/veh	15.9			14.4			9.3			12.8		
Approach LOS	B			B			A			B		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	5.7	21.6	10.7		10.3	17.0	10.7					
Change Period (Y+Rc), s	5.0	5.0	5.0		5.0	5.0	5.0					
Max Green Setting (Gmax), s	7.0	43.0	25.0		7.0	43.0	25.0					
Max Q Clear Time (g_c+I1), s	2.2	12.0	5.4		5.5	9.3	2.8					
Green Ext Time (p_c), s	0.0	4.5	0.7		0.1	2.7	0.1					
Intersection Summary												
HCM 6th Ctrl Delay	11.4											
HCM 6th LOS	B											

HCM 6th TWSC  
2: N. Robertsdale ST & E 6th Avenue

2024 Total Traffic  
AM Peak Hour

















Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	15	23	1	40	0	1
Future Vol, veh/h	15	23	1	40	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	25	1	43	0	1
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	41	0	-	29
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-	3.318
Pot Cap-1 Maneuver	-	-	1568	-	0	1046
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1568	-	-	1046
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		8.4	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1046	-	-	1568	-	
HCM Lane V/C Ratio	0.001	-	-	0.001	-	
HCM Control Delay (s)	8.4	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↘	↗↗	↗	↘	↗↘	
Traffic Vol, veh/h	0	0	21	0	0	63	7	697	13	22	349	6
Future Vol, veh/h	0	0	21	0	0	63	7	697	13	22	349	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	200	200	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	23	0	0	68	8	758	14	24	379	7
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	193	-	-	379	386	0	0	772	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	816	0	0	619	1169	-	-	839	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	816	-	-	619	1169	-	-	839	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.5		11.5		0.1		0.5					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1169	-	-	816	619	839	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.028	0.111	0.029	-	-				
HCM Control Delay (s)	8.1	-	-	9.5	11.5	9.4	-	-				
HCM Lane LOS	A	-	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.1	-	-				



Timings  
9: NB S. Powhatan Rd & E. Ellsworth Ave

2024 Total Traffic  
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	77	10	135	10	10	406	25	125	228
Future Volume (vph)	77	10	135	10	10	406	25	125	228
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0
Total Split (s)	25.0	25.0	25.0	25.0	12.0	53.0	53.0	12.0	53.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	13.3%	58.9%	58.9%	13.3%	58.9%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min
Act Effect Green (s)		20.4		20.4	16.9	12.5	12.5	20.9	19.6
Actuated g/C Ratio		0.39		0.39	0.32	0.24	0.24	0.40	0.38
v/c Ratio		0.29		0.71	0.03	0.54	0.06	0.35	0.21
Control Delay		13.7		21.4	8.5	20.5	0.3	11.4	11.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		13.7		21.4	8.5	20.5	0.3	11.4	11.5
LOS		B		C	A	C	A	B	B
Approach Delay		13.7		21.4		19.1			11.5
Approach LOS		B		C		B			B

Intersection Summary

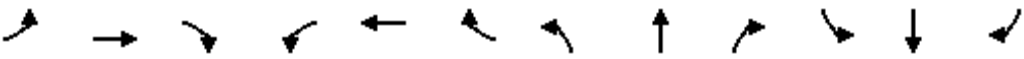
Cycle Length: 90	
Actuated Cycle Length: 52.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 53.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: NB S. Powhatan Rd & E. Ellsworth Ave

 Ø1	 Ø2	 Ø4
12 s	53 s	25 s
 Ø5	 Ø6	 Ø8
12 s	53 s	25 s

# HCM 6th Signalized Intersection Summary 9: NB S. Powhatan Rd & E. Ellsworth Ave

2024 Total Traffic  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↕	↕	↔	↕	↕
Traffic Volume (veh/h)	77	10	32	135	10	234	10	406	25	125	228	17
Future Volume (veh/h)	77	10	32	135	10	234	10	406	25	125	228	17
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	11	35	153	11	266	11	461	28	142	259	18
Peak Hour Factor	0.92	0.92	0.92	0.88	0.92	0.88	0.92	0.88	0.88	0.88	0.88	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	368	63	109	266	42	318	445	821	366	438	1048	72
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.01	0.23	0.23	0.09	0.31	0.31
Sat Flow, veh/h	700	190	328	466	125	959	1781	3554	1585	1781	3372	233
Grp Volume(v), veh/h	130	0	0	430	0	0	11	461	28	142	136	141
Grp Sat Flow(s),veh/h/ln	1218	0	0	1551	0	0	1781	1777	1585	1781	1777	1828
Q Serve(g_s), s	0.0	0.0	0.0	8.0	0.0	0.0	0.2	5.0	0.6	2.5	2.5	2.5
Cycle Q Clear(g_c), s	3.0	0.0	0.0	11.1	0.0	0.0	0.2	5.0	0.6	2.5	2.5	2.5
Prop In Lane	0.65		0.27	0.36		0.62	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	540	0	0	626	0	0	445	821	366	438	552	568
V/C Ratio(X)	0.24	0.00	0.00	0.69	0.00	0.00	0.02	0.56	0.08	0.32	0.25	0.25
Avail Cap(c_a), veh/h	697	0	0	816	0	0	705	3905	1742	556	1952	2009
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.7	0.0	0.0	13.3	0.0	0.0	12.5	14.8	13.1	10.9	11.2	11.2
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.6	0.0	0.0	0.0	0.6	0.1	0.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	3.0	0.0	0.0	0.1	1.6	0.2	0.7	0.7	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.9	0.0	0.0	14.9	0.0	0.0	12.5	15.4	13.2	11.3	11.5	11.5
LnGrp LOS	B	A	A	B	A	A	B	B	B	B	B	B
Approach Vol, veh/h	130			430			500			419		
Approach Delay, s/veh	10.9			14.9			15.3			11.4		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	15.1		19.5	5.6	18.6		19.5				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	48.0		20.0	7.0	48.0		20.0				
Max Q Clear Time (g_c+I1), s	4.5	7.0		5.0	2.2	4.5		13.1				
Green Ext Time (p_c), s	0.1	3.1		0.6	0.0	1.5		1.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				13.7								
HCM 6th LOS				B								

HCM 6th Roundabout  
10: E 6th Avenue & E Ellsworth Avenue

2024 Total Traffic  
AM Peak Hour

Intersection				
Intersection Delay, s/veh	3.3			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	65	45	126	24
Demand Flow Rate, veh/h	66	46	129	24
Vehicles Circulating, veh/h	0	138	22	175
Vehicles Exiting, veh/h	199	13	44	9
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.0	3.4	3.5	3.3
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	66	46	129	24
Cap Entry Lane, veh/h	1380	1199	1349	1154
Entry HV Adj Factor	0.981	0.980	0.977	1.000
Flow Entry, veh/h	65	45	126	24
Cap Entry, veh/h	1354	1175	1318	1154
V/C Ratio	0.048	0.038	0.096	0.021
Control Delay, s/veh	3.0	3.4	3.5	3.3
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0






HCM 6th TWSC  
33: S. Powhaton Rd & E. 4th Ave

2024 Total Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗	↗		↗↗
Traffic Vol, veh/h	0	50	754	6	0	377
Future Vol, veh/h	0	50	754	6	0	377
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	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	54	820	7	0	410
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	410	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	591	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	591	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)	-	591		-		
HCM Lane V/C Ratio	-	0.092		-		
HCM Control Delay (s)	-	11.7		-		
HCM Lane LOS	-	B		-		
HCM 95th %tile Q(veh)	-	0.3		-		

HCM 6th TWSC  
34: E 6th Avenue & 4th Pl





2024 Total Traffic  
AM Peak Hour






Intersection						
Int Delay, s/veh	4.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	17	6	26	9	6
Future Vol, veh/h	14	17	6	26	9	6
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	18	7	28	10	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	56	14	17	0	-	0
Stage 1	14	-	-	-	-	-
Stage 2	42	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	952	1066	1600	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	980	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	948	1066	1600	-	-	-
Mov Cap-2 Maneuver	884	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	980	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.8	1.4		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1600	-	975	-	-	
HCM Lane V/C Ratio	0.004	-	0.035	-	-	
HCM Control Delay (s)	7.3	-	8.8	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	



HCM 6th TWSC  
35: E 6th Avenue & E 3rd Ave

2024 Total Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	2	1	14	20	7
Future Vol, veh/h	18	2	1	14	20	7
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	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	2	1	15	22	8
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	43	26	30	0	-	0
Stage 1	26	-	-	-	-	-
Stage 2	17	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	968	1050	1583	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	967	1050	1583	-	-	-
Mov Cap-2 Maneuver	898	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1583	-	911	-	-	
HCM Lane V/C Ratio	0.001	-	0.024	-	-	
HCM Control Delay (s)	7.3	-	9	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	3	1	7	19	3
Future Vol, veh/h	8	3	1	7	19	3
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	3	1	8	21	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	33	23	24	0	-	0
Stage 1	23	-	-	-	-	-
Stage 2	10	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	980	1054	1591	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	979	1054	1591	-	-	-
Mov Cap-2 Maneuver	905	-	-	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.9		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1591	-	941	-	-	
HCM Lane V/C Ratio	0.001	-	0.013	-	-	
HCM Control Delay (s)	7.3	-	8.9	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	





















HCM 6th Roundabout  
38: N. Robertsdale St & E Ellsworth Ave

2024 Total Traffic  
AM Peak Hour

Intersection				
Intersection Delay, s/veh	4.2			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	164	244	90	99
Demand Flow Rate, veh/h	167	248	91	101
Vehicles Circulating, veh/h	18	88	149	309
Vehicles Exiting, veh/h	392	152	35	27
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.7	4.6	3.7	4.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	167	248	91	101
Cap Entry Lane, veh/h	1355	1261	1185	1007
Entry HV Adj Factor	0.985	0.982	0.989	0.980
Flow Entry, veh/h	164	244	90	99
Cap Entry, veh/h	1334	1239	1172	987
V/C Ratio	0.123	0.197	0.077	0.100
Control Delay, s/veh	3.7	4.6	3.7	4.6
LOS	A	A	A	A
95th %tile Queue, veh	0	1	0	0

Timings  
1: S. Powhaton Rd & E 6th Avenue

2024 Total Traffic  
PM Peak Hour

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	184	68	241	1	22	207	450	16	43	628
Future Volume (vph)	184	68	241	1	22	207	450	16	43	628
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	7	4	4	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	10.0	23.0	23.0	10.0	23.0
Total Split (s)	10.0	21.0	21.0	10.0	21.0	12.0	47.0	47.0	12.0	47.0
Total Split (%)	11.1%	23.3%	23.3%	11.1%	23.3%	13.3%	52.2%	52.2%	13.3%	52.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effect Green (s)	12.9	12.0	12.0	10.4	7.8	51.9	47.9	47.9	48.6	42.3
Actuated g/C Ratio	0.16	0.15	0.15	0.13	0.10	0.66	0.61	0.61	0.62	0.54
v/c Ratio	0.98	0.26	0.56	0.00	0.19	0.91	0.43	0.02	0.08	0.90
Control Delay	91.6	31.8	9.6	24.0	27.2	59.1	12.8	0.0	6.0	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.6	31.8	9.6	24.0	27.2	59.1	12.8	0.0	6.0	32.3
LOS	F	C	A	C	C	E	B	A	A	C
Approach Delay		43.2			27.2		26.7			31.0
Approach LOS		D			C		C			C

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 78.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 32.5







Intersection LOS: C

Intersection Capacity Utilization 85.3%

ICU Level of Service E

Analysis Period (min) 15
























Splits and Phases: 1: S. Powhaton Rd & E 6th Avenue

			
12 s	47 s	10 s	21 s
			
12 s	47 s	10 s	21 s

# HCM 6th Signalized Intersection Summary

## 1: S. Powhaton Rd & E 6th Avenue




2024 Total Traffic  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	68	241	1	22	11	207	450	16	43	628	187
Future Volume (veh/h)	184	68	241	1	22	11	207	450	16	43	628	187
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	74	262	1	24	12	225	489	17	47	683	203
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	340	347	294	221	150	75	234	1006	853	495	685	204
Arrive On Green	0.06	0.19	0.19	0.00	0.13	0.13	0.08	0.54	0.54	0.04	0.49	0.49
Sat Flow, veh/h	1781	1870	1585	1781	1176	588	1781	1870	1585	1781	1385	412
Grp Volume(v), veh/h	200	74	262	1	0	36	225	489	17	47	0	886
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1764	1781	1870	1585	1781	0	1796
Q Serve(g_s), s	5.0	2.8	13.7	0.0	0.0	1.5	6.5	13.9	0.4	1.1	0.0	41.7
Cycle Q Clear(g_c), s	5.0	2.8	13.7	0.0	0.0	1.5	6.5	13.9	0.4	1.1	0.0	41.7
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	340	347	294	221	0	226	234	1006	853	495	0	889
V/C Ratio(X)	0.59	0.21	0.89	0.00	0.00	0.16	0.96	0.49	0.02	0.09	0.00	1.00
Avail Cap(c_a), veh/h	340	353	299	323	0	333	234	1006	853	572	0	889
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.5	29.3	33.7	32.2	0.0	32.9	23.8	12.3	9.2	10.1	0.0	21.4
Incr Delay (d2), s/veh	2.6	0.3	26.3	0.0	0.0	0.3	48.0	0.4	0.0	0.1	0.0	29.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.3	7.1	0.0	0.0	0.6	5.4	4.9	0.1	0.4	0.0	23.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	29.6	60.1	32.2	0.0	33.3	71.8	12.6	9.2	10.2	0.0	50.6
LnGrp LOS	C	C	E	C	A	C	E	B	A	B	A	D
Approach Vol, veh/h		536			37			731			933	
Approach Delay, s/veh		46.2			33.2			30.8			48.6	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	50.7	5.1	20.7	12.0	47.0	10.0	15.9				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	42.0	5.0	16.0	7.0	42.0	5.0	16.0				
Max Q Clear Time (g_c+I1), s	3.1	15.9	2.0	15.7	8.5	43.7	7.0	3.5				
Green Ext Time (p_c), s	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			41.9									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												



HCM 6th TWSC  
2: N. Robertsdale ST & E 6th Avenue

2024 Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	52	75	1	33	0	1
Future Vol, veh/h	52	75	1	33	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	82	1	36	0	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	139	0	-	98
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-	3.318
Pot Cap-1 Maneuver	-	-	1445	-	0	958
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1445	-	-	958
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		8.8	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	958	-	-	1445	-	
HCM Lane V/C Ratio	0.001	-	-	0.001	-	
HCM Control Delay (s)	8.8	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗↗	↗	↗	↗↗	
Traffic Vol, veh/h	0	0	13	0	0	50	24	602	49	86	764	19
Future Vol, veh/h	0	0	13	0	0	50	24	602	49	86	764	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	200	200	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	14	0	0	54	26	654	53	93	830	21

















Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	426	-	-	327	851	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-
Pot Cap-1 Maneuver	0	0	577	0	0	669	783	-
Stage 1	0	0	-	0	0	-	-	-
Stage 2	0	0	-	0	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	577	-	-	669	783	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	10.9	0.3	0.9
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	783	-	-	577	669	887	-
HCM Lane V/C Ratio	0.033	-	-	0.024	0.081	0.105	-
HCM Control Delay (s)	9.8	-	-	11.4	10.9	9.5	-
HCM Lane LOS	A	-	-	B	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.3	0.4	-

Timings  
9: NB S. Powhatan Rd & E. Ellsworth Ave

2024 Total Traffic  
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	46	5	96	5	36	476	74	243	468
Future Volume (vph)	46	5	96	5	36	476	74	243	468
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0
Total Split (s)	25.0	25.0	25.0	25.0	12.0	61.0	61.0	12.0	61.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	12.2%	62.2%	62.2%	12.2%	62.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min
Act Effect Green (s)		14.0		14.0	20.5	14.3	14.3	24.9	22.4
Actuated g/C Ratio		0.28		0.28	0.40	0.28	0.28	0.49	0.44
v/c Ratio		0.21		0.64	0.09	0.54	0.17	0.61	0.39
Control Delay		13.6		19.8	7.6	18.1	5.2	16.2	12.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		13.6		19.8	7.6	18.1	5.2	16.2	12.5
LOS		B		B	A	B	A	B	B
Approach Delay		13.6		19.8		15.9			13.6
Approach LOS		B		B		B			B

Intersection Summary





















Cycle Length: 98
Actuated Cycle Length: 50.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 15.3
Intersection Capacity Utilization 54.6%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service A

Splits and Phases: 9: NB S. Powhatan Rd & E. Ellsworth Ave

 Ø1	 Ø2	 Ø4
12 s	61 s	25 s
 Ø5	 Ø6	 Ø8
12 s	61 s	25 s

# HCM 6th Signalized Intersection Summary 9: NB S. Powhatan Rd & E. Ellsworth Ave

2024 Total Traffic  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	5	20	96	5	153	36	476	74	243	468	66
Future Volume (veh/h)	46	5	20	96	5	153	36	476	74	243	468	66
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	5	22	109	5	174	39	541	84	276	532	72
Peak Hour Factor	0.92	0.92	0.92	0.88	0.92	0.88	0.92	0.88	0.88	0.88	0.88	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	51	98	229	33	225	439	952	425	532	1160	156
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.04	0.27	0.27	0.14	0.37	0.37
Sat Flow, veh/h	804	211	406	473	135	928	1781	3554	1585	1781	3146	424
Grp Volume(v), veh/h	77	0	0	288	0	0	39	541	84	276	300	304
Grp Sat Flow(s),veh/h/ln	1420	0	0	1537	0	0	1781	1777	1585	1781	1777	1794
Q Serve(g_s), s	0.0	0.0	0.0	5.7	0.0	0.0	0.7	5.7	1.8	4.4	5.6	5.6
Cycle Q Clear(g_c), s	1.6	0.0	0.0	7.5	0.0	0.0	0.7	5.7	1.8	4.4	5.6	5.6
Prop In Lane	0.65		0.29	0.38		0.60	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	481	0	0	487	0	0	439	952	425	532	655	661
V/C Ratio(X)	0.16	0.00	0.00	0.59	0.00	0.00	0.09	0.57	0.20	0.52	0.46	0.46
Avail Cap(c_a), veh/h	771	0	0	816	0	0	649	4589	2047	563	2295	2317
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	0.0	0.0	15.2	0.0	0.0	10.5	13.7	12.3	8.8	10.4	10.4
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.2	0.0	0.0	0.1	0.5	0.2	0.8	0.5	0.5
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	0.5	0.0	0.0	2.1	0.0	0.0	0.2	1.7	0.5	1.1	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	0.0	0.0	16.4	0.0	0.0	10.6	14.2	12.5	9.6	10.9	10.9
LnGrp LOS	B	A	A	B	A	A	B	B	B	A	B	B
Approach Vol, veh/h	77			288			664			880		
Approach Delay, s/veh	13.2			16.4			13.8			10.5		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.2	16.6		15.5	6.9	21.0		15.5				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	56.0		20.0	7.0	56.0		20.0				
Max Q Clear Time (g_c+I1), s	6.4	7.7		3.6	2.7	7.6		9.5				
Green Ext Time (p_c), s	0.1	3.9		0.3	0.0	3.6		1.1				
Intersection Summary												
HCM 6th Ctrl Delay	12.6											
HCM 6th LOS	B											
Notes												
User approved volume balancing among the lanes for turning movement.												

HCM 6th Roundabout  
10: E 6th Avenue & E Ellsworth Avenue

2024 Total Traffic  
PM Peak Hour

Intersection				
Intersection Delay, s/veh 3.6				
Intersection LOS A				
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	198	28	85	12
Demand Flow Rate, veh/h	202	29	87	12
Vehicles Circulating, veh/h	0	97	56	116
Vehicles Exiting, veh/h	128	46	146	10
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.8	3.1	3.4	3.0
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	202	29	87	12
Cap Entry Lane, veh/h	1380	1250	1303	1226
Entry HV Adj Factor	0.981	0.980	0.977	1.000
Flow Entry, veh/h	198	28	85	12
Cap Entry, veh/h	1353	1225	1273	1226
V/C Ratio	0.146	0.023	0.067	0.010
Control Delay, s/veh	3.8	3.1	3.4	3.0
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0







HCM 6th TWSC  
33: S. Powhaton Rd & E. 4th Ave

2024 Total Traffic  
PM Peak Hour

Intersection

Int Delay, s/veh 0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	41	632	20	0	869
Future Vol, veh/h	0	41	632	20	0	869
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	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	45	687	22	0	945






Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	344	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	652	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	-	652	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	652
HCM Lane V/C Ratio	-	-	0.068
HCM Control Delay (s)	-	-	10.9
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2





HCM 6th TWSC  
34: E 6th Avenue & 4th PI

2024 Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	6	2	21	34	18
Future Vol, veh/h	12	6	2	21	34	18
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	7	2	23	37	20
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	74	47	57	0	-	0
Stage 1	47	-	-	-	-	-
Stage 2	27	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	930	1022	1547	-	-	-
Stage 1	975	-	-	-	-	-
Stage 2	996	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	929	1022	1547	-	-	-
Mov Cap-2 Maneuver	873	-	-	-	-	-
Stage 1	974	-	-	-	-	-
Stage 2	996	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1547	-	918	-	-	
HCM Lane V/C Ratio	0.001	-	0.021	-	-	
HCM Control Delay (s)	7.3	-	9	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	






HCM 6th TWSC  
35: E 6th Avenue & E 3rd Ave

2024 Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	2	3	9	16	24
Future Vol, veh/h	15	2	3	9	16	24
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	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	2	3	10	17	26
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	46	30	43	0	-	0
Stage 1	30	-	-	-	-	-
Stage 2	16	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	964	1044	1566	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1007	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	962	1044	1566	-	-	-
Mov Cap-2 Maneuver	894	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	1007	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	1.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1566	-	909	-	-	
HCM Lane V/C Ratio	0.002	-	0.02	-	-	
HCM Control Delay (s)	7.3	-	9	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC  
37: E 6th Avenue & E 2nd PI

2024 Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	3.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	3	4	5	8	10
Future Vol, veh/h	7	3	4	5	8	10
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	3	4	5	9	11

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	28	15	20	0	-	0
Stage 1	15	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	987	1065	1596	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	984	1065	1596	-	-	-
Mov Cap-2 Maneuver	909	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	3.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1596	-	951	-	-
HCM Lane V/C Ratio	0.003	-	0.011	-	-
HCM Control Delay (s)	7.3	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th Roundabout  
38: N. Robertsdale St & E Ellsworth Ave

2024 Total Traffic  
PM Peak Hour

























Intersection				
Intersection Delay, s/veh	4.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	339	145	68	74
Demand Flow Rate, veh/h	346	147	69	75
Vehicles Circulating, veh/h	15	87	245	194
Vehicles Exiting, veh/h	254	227	116	40
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.9	3.9	4.0	3.8
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	346	147	69	75
Cap Entry Lane, veh/h	1359	1263	1075	1132
Entry HV Adj Factor	0.979	0.983	0.985	0.986
Flow Entry, veh/h	339	145	68	74
Cap Entry, veh/h	1330	1242	1059	1116
V/C Ratio	0.255	0.116	0.064	0.066
Control Delay, s/veh	4.9	3.9	4.0	3.8
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0



# Timings

## 1: S. Powhaton Road & E 6th Avenue

2040 Background Traffic  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	358	206	63	742	92	387	850	151	72	604	143
Future Volume (vph)	162	358	206	63	742	92	387	850	151	72	604	143
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8			2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0		10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	12.0	38.0		12.0	38.0	38.0	25.0	58.0	58.0	12.0	45.0	45.0
Total Split (%)	10.0%	31.7%		10.0%	31.7%	31.7%	20.8%	48.3%	48.3%	10.0%	37.5%	37.5%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	34.2	28.6	120.0	33.0	26.2	26.2	19.1	61.5	61.5	55.1	47.7	47.7
Actuated g/C Ratio	0.28	0.24	1.00	0.28	0.22	0.22	0.16	0.51	0.51	0.46	0.40	0.40
v/c Ratio	1.02	0.32	0.14	0.23	0.73	0.21	0.77	0.51	0.18	0.25	0.47	0.21
Control Delay	110.4	38.5	0.2	20.7	35.2	2.3	48.7	37.5	15.3	14.7	29.4	5.1
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	110.4	38.5	0.2	20.7	35.2	2.3	48.7	37.5	15.3	14.7	29.4	5.1
LOS	F	D	A	C	D	A	D	D	B	B	C	A
Approach Delay		43.6			30.8			38.2			23.8	
Approach LOS		D			C			D			C	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 34.4

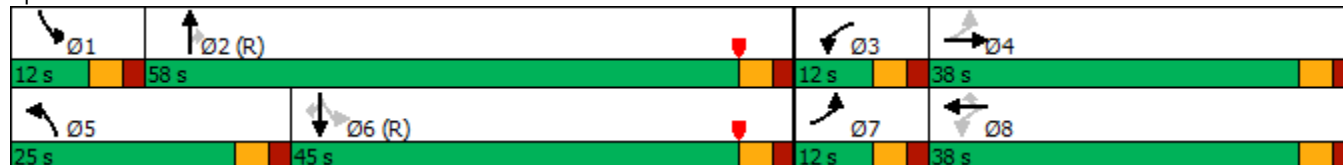
Intersection LOS: C

Intersection Capacity Utilization 67.7%

ICU Level of Service C

Analysis Period (min) 15
































Splits and Phases: 1: S. Powhaton Road & E 6th Avenue



# HCM 6th Signalized Intersection Summary

## 1: S. Powhatan Road & E 6th Avenue

2040 Background Traffic  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 			 	
Traffic Volume (veh/h)	162	358	206	63	742	92	387	850	151	72	604	143
Future Volume (veh/h)	162	358	206	63	742	92	387	850	151	72	604	143
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	176	389	0	68	807	100	421	924	164	78	657	155
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	1122		289	1038	322	486	1894	845	320	1532	683
Arrive On Green	0.06	0.22	0.00	0.04	0.20	0.20	0.14	0.53	0.53	0.04	0.43	0.43
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	176	389	0	68	807	100	421	924	164	78	657	155
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.0	7.7	0.0	3.6	17.9	6.4	14.3	19.7	6.5	2.9	15.5	7.4
Cycle Q Clear(g_c), s	7.0	7.7	0.0	3.6	17.9	6.4	14.3	19.7	6.5	2.9	15.5	7.4
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	197	1122		289	1038	322	486	1894	845	320	1532	683
V/C Ratio(X)	0.89	0.35		0.24	0.78	0.31	0.87	0.49	0.19	0.24	0.43	0.23
Avail Cap(c_a), veh/h	197	1404		319	1404	436	576	1894	845	355	1532	683
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(l)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.9	39.5	0.0	35.7	45.2	40.6	50.5	17.7	14.6	17.9	23.8	21.5
Incr Delay (d2), s/veh	36.3	0.2	0.0	0.4	2.0	0.5	11.7	0.9	0.5	0.4	0.9	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(50%),veh/ln	3.8	3.2	0.0	1.6	7.5	2.5	6.8	7.7	2.3	1.2	6.4	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.2	39.7	0.0	36.1	47.2	41.2	62.1	18.6	15.1	18.3	24.7	22.3
LnGrp LOS	E	D		D	D	D	E	B	B	B	C	C
Approach Vol, veh/h		565			975			1509			890	
Approach Delay, s/veh		52.0			45.8			30.4			23.7	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	69.0	10.0	31.4	21.9	56.7	12.0	29.4				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	53.0	7.0	33.0	20.0	40.0	7.0	33.0				
Max Q Clear Time (g_c+I1), s	4.9	21.7	5.6	9.7	16.3	17.5	9.0	19.9				
Green Ext Time (p_c), s	0.0	7.5	0.0	2.3	0.6	4.6	0.0	4.5				

### Intersection Summary



















HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

### Notes

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

# Timings 3: Trussville Street & E 6th Avenue

2040 Background Traffic  
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	55	519	36	725	17	20	55	10	155
Future Volume (vph)	55	519	36	725	17	20	55	10	155
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	1	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	23.0	10.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (s)	12.0	78.0	12.0	78.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	10.0%	65.0%	10.0%	65.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	95.5	91.5	94.0	89.1	11.7	11.7	11.7	11.7	11.7
Actuated g/C Ratio	0.80	0.76	0.78	0.74	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.11	0.15	0.06	0.22	0.13	0.23	0.45	0.06	0.55
Control Delay	2.3	3.5	7.6	12.2	50.5	32.3	61.7	48.4	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	3.5	7.6	12.2	50.5	32.3	61.7	48.4	14.4
LOS	A	A	A	B	D	C	E	D	B
Approach Delay		3.4		12.0		37.6		27.8	
Approach LOS		A		B		D		C	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 77 (64%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 11.9

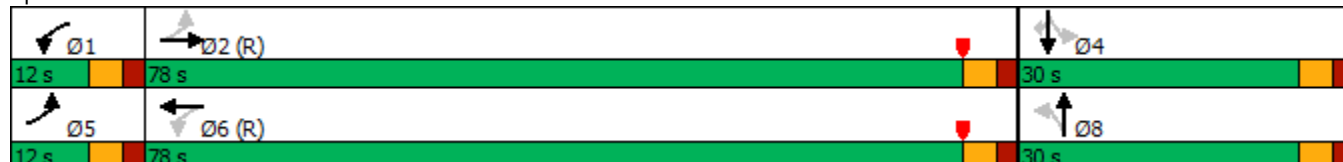
Intersection LOS: B

Intersection Capacity Utilization 44.9%

ICU Level of Service A

Analysis Period (min) 15











Splits and Phases: 3: Trussville Street & E 6th Avenue



# HCM 6th Signalized Intersection Summary

## 3: Trussville Street & E 6th Avenue

2040 Background Traffic  
AM Peak Hour

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	519	6	36	725	20	17	20	20	55	10	155
Future Volume (veh/h)	55	519	6	36	725	20	17	20	20	55	10	155
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	564	7	39	788	22	18	22	22	60	11	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	605	3742	46	715	3646	102	204	107	107	199	234	198
Arrive On Green	0.07	1.00	1.00	0.06	1.00	1.00	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1781	5198	64	1781	5106	142	1205	858	858	1362	1870	1585
Grp Volume(v), veh/h	60	369	202	39	525	285	18	0	44	60	11	168
Grp Sat Flow(s),veh/h/ln	1781	1702	1859	1781	1702	1845	1205	0	1716	1362	1870	1585
Q Serve(g_s), s	1.0	0.0	0.0	0.7	0.0	0.0	1.6	0.0	2.8	5.0	0.6	12.4
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.7	0.0	0.0	2.2	0.0	2.8	7.7	0.6	12.4
Prop In Lane	1.00		0.03	1.00		0.08	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	605	2450	1338	715	2431	1317	204	0	214	199	234	198
V/C Ratio(X)	0.10	0.15	0.15	0.05	0.22	0.22	0.09	0.00	0.21	0.30	0.05	0.85
Avail Cap(c_a), veh/h	645	2450	1338	764	2431	1317	305	0	357	312	390	330
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.7	0.0	0.0	3.9	0.0	0.0	47.2	0.0	47.2	50.6	46.2	51.4
Incr Delay (d2), s/veh	0.1	0.1	0.2	0.0	0.2	0.4	0.2	0.0	0.5	0.8	0.1	10.2
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(50%),veh/ln	0.3	0.0	0.1	0.2	0.1	0.1	0.5	0.0	1.2	1.7	0.3	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.8	0.1	0.2	3.9	0.2	0.4	47.4	0.0	47.6	51.5	46.3	61.6
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	D	E
Approach Vol, veh/h	631			849			62			239		
Approach Delay, s/veh	0.5			0.4			47.6			58.3		
Approach LOS	A			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	91.4		20.0	9.3	90.7		20.0				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	73.0		25.0	7.0	73.0		25.0				
Max Q Clear Time (g_c+I1), s	2.7	2.0		14.4	3.0	2.0		4.8				
Green Ext Time (p_c), s	0.0	3.6		0.5	0.0	5.5		0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				9.9								
HCM 6th LOS				A								

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↑↑	↑↑	
Traffic Vol, veh/h	0	21	7	1388	866	6
Future Vol, veh/h	0	21	7	1388	866	6
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	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	8	1509	941	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	474	948	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	0	537	720	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	537	720	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	720	-	537	-	-	
HCM Lane V/C Ratio	0.011	-	0.043	-	-	
HCM Control Delay (s)	10.1	-	12	-	-	
HCM Lane LOS	B	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	



Timings  
9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave

2040 Background Traffic  
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	77	10	196	10	10	1076	109	112	758
Future Volume (vph)	77	10	196	10	10	1076	109	112	758
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	23.0	23.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0
Total Split (s)	50.0	50.0	50.0	50.0	12.0	58.0	58.0	12.0	58.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	10.0%	48.3%	48.3%	10.0%	48.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		41.8		41.8	61.9	56.0	56.0	67.3	65.9
Actuated g/C Ratio		0.35		0.35	0.52	0.47	0.47	0.56	0.55
v/c Ratio		0.35		0.94	0.03	0.71	0.15	0.58	0.43
Control Delay		26.7		60.1	11.3	21.3	4.3	42.9	36.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		26.7		60.1	11.3	21.3	4.3	42.9	36.6
LOS		C		E	B	C	A	D	D
Approach Delay		26.7		60.1		19.7			37.4
Approach LOS		C		E		B			D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 32.7

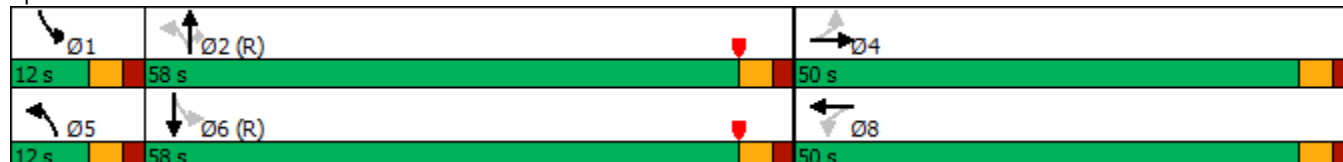
Intersection LOS: C

Intersection Capacity Utilization 76.3%

ICU Level of Service D

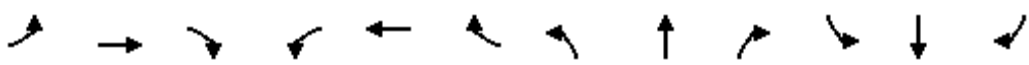
Analysis Period (min) 15

Splits and Phases: 9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave







HCM 6th Signalized Intersection Summary  
9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave

2040 Background Traffic  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	77	10	32	196	10	242	10	1076	109	112	758	17
Future Volume (veh/h)	77	10	32	196	10	242	10	1076	109	112	758	17
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	11	35	213	11	263	11	1170	118	122	824	18
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	275	41	98	268	13	278	327	1712	764	340	1844	40
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.03	0.96	0.96	0.05	0.52	0.52
Sat Flow, veh/h	656	121	286	654	37	811	1781	3554	1585	1781	3556	78
Grp Volume(v), veh/h	130	0	0	487	0	0	11	1170	118	122	412	430
Grp Sat Flow(s),veh/h/ln	1063	0	0	1501	0	0	1781	1777	1585	1781	1777	1856
Q Serve(g_s), s	0.0	0.0	0.0	27.3	0.0	0.0	0.4	4.2	0.4	4.0	17.4	17.4
Cycle Q Clear(g_c), s	10.5	0.0	0.0	37.8	0.0	0.0	0.4	4.2	0.4	4.0	17.4	17.4
Prop In Lane	0.65		0.27	0.44		0.54	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	415	0	0	559	0	0	327	1712	764	340	922	963
V/C Ratio(X)	0.31	0.00	0.00	0.87	0.00	0.00	0.03	0.68	0.15	0.36	0.45	0.45
Avail Cap(c_a), veh/h	454	0	0	605	0	0	408	1712	764	356	922	963
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	0.00	0.81	0.81	0.81	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	0.0	38.1	0.0	0.0	15.9	1.2	1.1	13.6	18.1	18.1
Incr Delay (d2), s/veh	0.4	0.0	0.0	12.5	0.0	0.0	0.0	1.8	0.3	0.6	1.6	1.5
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	2.8	0.0	0.0	15.5	0.0	0.0	0.1	1.0	0.2	1.6	7.1	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	0.0	50.6	0.0	0.0	16.0	3.0	1.5	14.3	19.7	19.6
LnGrp LOS	C	A	A	D	A	A	B	A	A	B	B	B
Approach Vol, veh/h		130			487			1299			964	
Approach Delay, s/veh		29.5			50.6			3.0			18.9	
Approach LOS		C			D			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	62.8		46.2	6.5	67.2		46.2				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	53.0		45.0	7.0	53.0		45.0				
Max Q Clear Time (g_c+I1), s	6.0	6.2		12.5	2.4	19.4		39.8				
Green Ext Time (p_c), s	0.0	10.8		0.9	0.0	5.3		1.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				17.6								
HCM 6th LOS				B								





Intersection				
Intersection Delay, s/veh	5.8			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	323	352	216	94
Demand Flow Rate, veh/h	329	359	220	96
Vehicles Circulating, veh/h	58	223	274	528
Vehicles Exiting, veh/h	566	271	113	54
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.0	6.6	5.5	5.8
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	329	359	220	96
Cap Entry Lane, veh/h	1301	1099	1043	805
Entry HV Adj Factor	0.982	0.981	0.983	0.980
Flow Entry, veh/h	323	352	216	94
Cap Entry, veh/h	1277	1078	1026	789
V/C Ratio	0.253	0.327	0.211	0.119
Control Delay, s/veh	5.0	6.6	5.5	5.8
LOS	A	A	A	A
95th %tile Queue, veh	1	1	1	0

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	58	1	0	51
Future Vol, veh/h	1	0	58	1	0	51
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	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	63	1	0	55

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	119	64	0
Stage 1	64	-	-
Stage 2	55	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	877	1000	-
Stage 1	959	-	-
Stage 2	968	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	877	1000	-
Mov Cap-2 Maneuver	840	-	-
Stage 1	959	-	-
Stage 2	968	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	840	1538
HCM Lane V/C Ratio	-	-	0.001	-
HCM Control Delay (s)	-	-	9.3	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	3.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	21	34	16	7	44
Future Vol, veh/h	42	21	34	16	7	44
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	23	37	17	8	48

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	110	46	0
Stage 1	46	-	-
Stage 2	64	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	887	1023	-
Stage 1	976	-	-
Stage 2	959	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	883	1023	-
Mov Cap-2 Maneuver	843	-	-
Stage 1	976	-	-
Stage 2	954	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	1
HCM LOS	A		

























Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	896	1551
HCM Lane V/C Ratio	-	-	0.076	0.005
HCM Control Delay (s)	-	-	9.4	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection				
Intersection Delay, s/veh	5.2			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	250	429	71	10
Demand Flow Rate, veh/h	255	437	72	10
Vehicles Circulating, veh/h	24	68	240	502
Vehicles Exiting, veh/h	488	244	39	3
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.3	6.0	4.0	4.5
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	255	437	72	10
Cap Entry Lane, veh/h	1346	1287	1080	827
Entry HV Adj Factor	0.982	0.981	0.986	1.000
Flow Entry, veh/h	250	429	71	10
Cap Entry, veh/h	1322	1263	1065	827
V/C Ratio	0.189	0.339	0.067	0.012
Control Delay, s/veh	4.3	6.0	4.0	4.5
LOS	A	A	A	A
95th %tile Queue, veh	1	2	0	0



Timings  
1: S. Powhatan Road & E 6th Avenue

2040 Background Traffic  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	706	494	79	475	78	293	656	120	104	1161	187
Future Volume (vph)	157	706	494	79	475	78	293	656	120	104	1161	187
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8			2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0		10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	12.0	38.0		12.0	38.0	38.0	20.0	58.0	58.0	12.0	50.0	50.0
Total Split (%)	10.0%	31.7%		10.0%	31.7%	31.7%	16.7%	48.3%	48.3%	10.0%	41.7%	41.7%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	31.7	26.1	120.0	30.6	23.7	23.7	15.8	60.9	60.9	61.9	53.5	53.5
Actuated g/C Ratio	0.26	0.22	1.00	0.26	0.20	0.20	0.13	0.51	0.51	0.52	0.45	0.45
v/c Ratio	0.76	0.69	0.34	0.50	0.51	0.19	0.70	0.40	0.15	0.27	0.80	0.25
Control Delay	56.0	46.8	0.6	37.9	41.9	5.5	58.4	20.2	3.7	13.0	35.0	5.0
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	56.0	46.8	0.6	37.9	41.9	5.5	58.4	20.2	3.7	13.0	35.0	5.0
LOS	E	D	A	D	D	A	E	C	A	B	C	A
Approach Delay		31.1			36.9			28.8			29.5	
Approach LOS		C			D			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 30.9

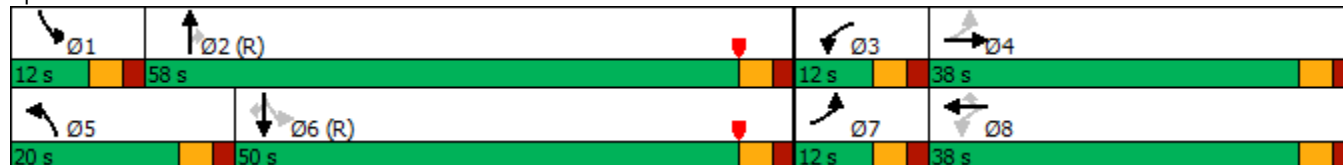
Intersection LOS: C

Intersection Capacity Utilization 75.1%

ICU Level of Service D

Analysis Period (min) 15
































Splits and Phases: 1: S. Powhatan Road & E 6th Avenue



# HCM 6th Signalized Intersection Summary

## 1: S. Powhatan Road & E 6th Avenue

2040 Background Traffic  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 			 	
Traffic Volume (veh/h)	157	706	494	79	475	78	293	656	120	104	1161	187
Future Volume (veh/h)	157	706	494	79	475	78	293	656	120	104	1161	187
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	171	767	0	86	516	85	318	713	130	113	1262	203
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	239	987		188	956	297	377	1919	856	422	1702	759
Arrive On Green	0.06	0.19	0.00	0.03	0.13	0.13	0.11	0.54	0.54	0.05	0.48	0.48
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	171	767	0	86	516	85	318	713	130	113	1262	203
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.0	17.1	0.0	4.6	11.4	5.8	10.8	13.9	4.9	3.8	34.4	9.2
Cycle Q Clear(g_c), s	7.0	17.1	0.0	4.6	11.4	5.8	10.8	13.9	4.9	3.8	34.4	9.2
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	239	987		188	956	297	377	1919	856	422	1702	759
V/C Ratio(X)	0.71	0.78		0.46	0.54	0.29	0.84	0.37	0.15	0.27	0.74	0.27
Avail Cap(c_a), veh/h	239	1404		199	1404	436	432	1919	856	441	1702	759
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	46.0	0.0	38.4	47.6	45.2	52.5	15.9	13.8	14.6	25.3	18.7
Incr Delay (d2), s/veh	9.6	1.8	0.0	1.7	0.5	0.5	12.8	0.6	0.4	0.3	3.0	0.9
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	2.0	7.2	0.0	2.1	4.9	2.3	5.2	5.4	1.8	1.5	14.2	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	47.8	0.0	40.2	48.1	45.7	65.3	16.4	14.2	14.9	28.2	19.6
LnGrp LOS	D	D		D	D	D	E	B	B	B	C	B
Approach Vol, veh/h		938			687			1161			1578	
Approach Delay, s/veh		48.4			46.8			29.6			26.2	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	69.8	11.3	28.2	18.1	62.5	12.0	27.5				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	53.0	7.0	33.0	15.0	45.0	7.0	33.0				
Max Q Clear Time (g_c+I1), s	5.8	15.9	6.6	19.1	12.8	36.4	9.0	13.4				
Green Ext Time (p_c), s	0.0	5.5	0.0	4.1	0.2	5.4	0.0	3.3				

### Intersection Summary



















HCM 6th Ctrl Delay	35.1
HCM 6th LOS	D

### Notes

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

# Timings 3: Trussville Street & E 6th Avenue

2040 Background Traffic  
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	195	709	28	507	16	15	40	30	110
Future Volume (vph)	195	709	28	507	16	15	40	30	110
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	1	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	23.0	10.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (s)	12.0	78.0	12.0	78.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	10.0%	65.0%	10.0%	65.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	98.1	92.5	91.6	85.8	10.8	10.8	10.8	10.8	10.8
Actuated g/C Ratio	0.82	0.77	0.76	0.72	0.09	0.09	0.09	0.09	0.09
v/c Ratio	0.32	0.20	0.06	0.17	0.14	0.27	0.36	0.20	0.48
Control Delay	9.4	2.1	1.5	3.5	52.3	27.6	59.4	53.0	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	2.1	1.5	3.5	52.3	27.6	59.4	53.0	15.4
LOS	A	A	A	A	D	C	E	D	B
Approach Delay		3.6		3.4		33.9		31.4	
Approach LOS		A		A		C		C	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 77 (64%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 7.4

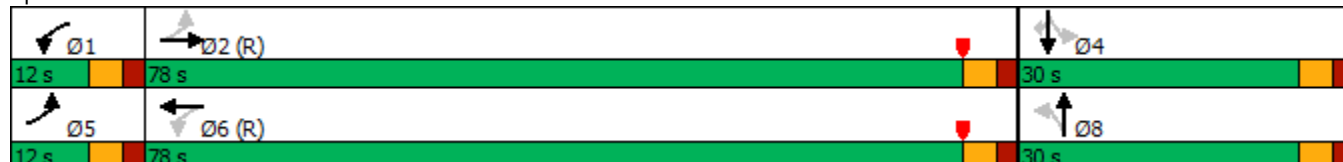
Intersection LOS: A

Intersection Capacity Utilization 44.7%

ICU Level of Service A

Analysis Period (min) 15

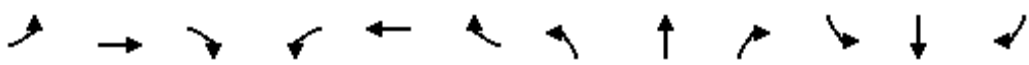









Splits and Phases: 3: Trussville Street & E 6th Avenue



# HCM 6th Signalized Intersection Summary

## 3: Trussville Street & E 6th Avenue

















2040 Background Traffic  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	709	26	28	507	55	16	15	30	40	30	110
Future Volume (veh/h)	195	709	26	28	507	55	16	15	30	40	30	110
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	212	771	28	30	551	60	17	16	33	43	33	120
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	740	3812	138	604	3417	368	157	52	107	152	178	151
Arrive On Green	0.10	1.00	1.00	0.05	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1781	5058	183	1781	4680	504	1234	545	1123	1356	1870	1585
Grp Volume(v), veh/h	212	518	281	30	399	212	17	0	49	43	33	120
Grp Sat Flow(s),veh/h/ln	1781	1702	1837	1781	1702	1780	1234	0	1668	1356	1870	1585
Q Serve(g_s), s	3.9	0.0	0.0	0.5	0.0	0.0	1.5	0.0	3.3	3.7	2.0	8.9
Cycle Q Clear(g_c), s	3.9	0.0	0.0	0.5	0.0	0.0	3.5	0.0	3.3	6.9	2.0	8.9
Prop In Lane	1.00		0.10	1.00		0.28	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	740	2565	1385	604	2486	1299	157	0	159	152	178	151
V/C Ratio(X)	0.29	0.20	0.20	0.05	0.16	0.16	0.11	0.00	0.31	0.28	0.19	0.80
Avail Cap(c_a), veh/h	756	2565	1385	661	2486	1299	297	0	348	305	390	330
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.2	0.0	0.0	3.5	0.0	0.0	51.6	0.0	50.6	53.9	50.0	53.2
Incr Delay (d2), s/veh	0.2	0.2	0.3	0.0	0.1	0.3	0.3	0.0	1.1	1.0	0.5	9.2
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(50%),veh/ln	0.9	0.1	0.1	0.1	0.0	0.1	0.5	0.0	1.4	1.3	0.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.4	0.2	0.3	3.6	0.1	0.3	51.9	0.0	51.7	54.9	50.5	62.3
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	D	E
Approach Vol, veh/h	1011				641				66			
Approach Delay, s/veh	0.9				0.3				51.8			
Approach LOS	A				A				D			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	95.4		16.4	11.0	92.6		16.4				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	73.0		25.0	7.0	73.0		25.0				
Max Q Clear Time (g_c+I1), s	2.5	2.0		10.9	5.9	2.0		5.5				
Green Ext Time (p_c), s	0.0	5.4		0.5	0.1	3.9		0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	8.4											
HCM 6th LOS	A											

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↑↑	↑↑	
Traffic Vol, veh/h	0	13	24	1069	1715	19
Future Vol, veh/h	0	13	24	1069	1715	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	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	26	1162	1864	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	943	1885	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	0	264	314	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	264	314	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	19.4	0.4		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	314	-	264	-	-	
HCM Lane V/C Ratio	0.083	-	0.054	-	-	
HCM Control Delay (s)	17.5	-	19.4	-	-	
HCM Lane LOS	C	-	C	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.2	-	-	

Timings  
9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave

2040 Background Traffic  
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	46	5	119	5	36	901	177	246	1416
Future Volume (vph)	46	5	119	5	36	901	177	246	1416
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	23.0	23.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0
Total Split (s)	40.0	40.0	40.0	40.0	12.0	53.0	53.0	12.0	53.0
Total Split (%)	38.1%	38.1%	38.1%	38.1%	11.4%	50.5%	50.5%	11.4%	50.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		23.1		23.1	59.8	53.4	53.4	71.3	64.8
Actuated g/C Ratio		0.22		0.22	0.57	0.51	0.51	0.68	0.62
v/c Ratio		0.29		0.80	0.21	0.54	0.21	0.63	0.74
Control Delay		25.8		46.4	10.5	20.0	3.1	16.9	20.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		25.8		46.4	10.5	20.0	3.1	16.9	20.0
LOS		C		D	B	B	A	B	C
Approach Delay		25.8		46.4		17.0			19.6
Approach LOS		C		D		B			B

Intersection Summary

Cycle Length: 105

Actuated Cycle Length: 105

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 21.1

Intersection LOS: C

Intersection Capacity Utilization 74.7%

ICU Level of Service D

Analysis Period (min) 15





















Splits and Phases: 9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave









HCM 6th Signalized Intersection Summary  
9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave

2040 Background Traffic  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	5	20	119	5	146	36	901	177	246	1416	66
Future Volume (veh/h)	46	5	20	119	5	146	36	901	177	246	1416	66
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	5	22	129	5	159	39	979	192	267	1539	72
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	204	28	70	188	13	180	220	2052	915	387	2114	99
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.03	0.58	0.58	0.07	0.61	0.61
Sat Flow, veh/h	690	130	328	650	63	846	1781	3554	1585	1781	3457	161
Grp Volume(v), veh/h	77	0	0	293	0	0	39	979	192	267	788	823
Grp Sat Flow(s),veh/h/ln	1148	0	0	1560	0	0	1781	1777	1585	1781	1777	1841
Q Serve(g_s), s	0.0	0.0	0.0	13.3	0.0	0.0	0.9	16.9	6.1	6.5	32.5	32.9
Cycle Q Clear(g_c), s	5.6	0.0	0.0	18.9	0.0	0.0	0.9	16.9	6.1	6.5	32.5	32.9
Prop In Lane	0.65		0.29	0.44		0.54	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	301	0	0	382	0	0	220	2052	915	387	1087	1126
V/C Ratio(X)	0.26	0.00	0.00	0.77	0.00	0.00	0.18	0.48	0.21	0.69	0.73	0.73
Avail Cap(c_a), veh/h	462	0	0	561	0	0	281	2052	915	387	1087	1126
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	0.00	1.00	0.00	0.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	0.0	0.0	39.6	0.0	0.0	12.9	12.9	10.7	10.9	14.2	14.3
Incr Delay (d2), s/veh	0.4	0.0	0.0	3.8	0.0	0.0	0.3	0.6	0.4	5.1	4.2	4.2
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(50%),veh/ln	1.7	0.0	0.0	7.5	0.0	0.0	0.3	6.1	2.0	2.6	12.3	12.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	0.0	0.0	43.4	0.0	0.0	13.2	13.6	11.1	16.0	18.5	18.5
LnGrp LOS	C	A	A	D	A	A	B	B	B	B	B	B
Approach Vol, veh/h	77			293			1210			1878		
Approach Delay, s/veh	34.9			43.4			13.2			18.1		
Approach LOS	C			D			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	65.6		27.4	8.4	69.2		27.4				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	48.0		35.0	7.0	48.0		35.0				
Max Q Clear Time (g_c+I1), s	8.5	18.9		7.6	2.9	34.9		20.9				
Green Ext Time (p_c), s	0.0	8.0		0.4	0.0	8.3		1.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				18.9								
HCM 6th LOS				B								





Intersection				
Intersection Delay, s/veh	5.2			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	394	221	131	79
Demand Flow Rate, veh/h	402	225	133	80
Vehicles Circulating, veh/h	85	146	307	283
Vehicles Exiting, veh/h	278	294	180	88
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.8	4.7	4.8	4.2
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	402	225	133	80
Cap Entry Lane, veh/h	1265	1189	1009	1034
Entry HV Adj Factor	0.979	0.983	0.984	0.985
Flow Entry, veh/h	394	221	131	79
Cap Entry, veh/h	1239	1168	993	1018
V/C Ratio	0.318	0.189	0.132	0.077
Control Delay, s/veh	5.8	4.7	4.8	4.2
LOS	A	A	A	A
95th %tile Queue, veh	1	1	0	0

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	4	56	8	5	79
Future Vol, veh/h	6	4	56	8	5	79
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	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	61	9	5	86

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	162	66	0	0	70
Stage 1	66	-	-	-	-
Stage 2	96	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	829	998	-	-	1531
Stage 1	957	-	-	-	-
Stage 2	928	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	827	998	-	-	1531
Mov Cap-2 Maneuver	806	-	-	-	-
Stage 1	957	-	-	-	-
Stage 2	925	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.4
HCM LOS	A		
































Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	873	1531
HCM Lane V/C Ratio	-	-	0.012	0.004
HCM Control Delay (s)	-	-	9.2	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	2.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	17	45	35	29	53
Future Vol, veh/h	20	17	45	35	29	53
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	18	49	38	32	58
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	190	68	0	0	87	0
Stage 1	68	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	799	995	-	-	1509	-
Stage 1	955	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	782	995	-	-	1509	-
Mov Cap-2 Maneuver	772	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.4	0		2.6		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	861		1509	-	
HCM Lane V/C Ratio	-	0.047		0.021	-	
HCM Control Delay (s)	-	9.4		7.4	-	
HCM Lane LOS	-	A		A	-	
HCM 95th %tile Q(veh)	-	0.1		0.1	-	

Intersection				
Intersection Delay, s/veh	5.3			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	454	258	57	6
Demand Flow Rate, veh/h	463	263	58	6
Vehicles Circulating, veh/h	20	56	376	308
Vehicles Exiting, veh/h	294	378	107	11
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.8	4.5	4.5	3.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	463	263	58	6
Cap Entry Lane, veh/h	1352	1303	940	1008
Entry HV Adj Factor	0.980	0.982	0.983	1.000
Flow Entry, veh/h	454	258	57	6
Cap Entry, veh/h	1325	1280	924	1008
V/C Ratio	0.342	0.202	0.062	0.006
Control Delay, s/veh	5.8	4.5	4.5	3.6
LOS	A	A	A	A
95th %tile Queue, veh	2	1	0	0

Timings  
1: S. Powhatan Road & E 6th Avenue

2040 Total Traffic  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 			 	
Traffic Volume (vph)	162	369	212	63	758	97	419	869	156	76	608	143
Future Volume (vph)	162	369	212	63	758	97	419	869	156	76	608	143
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8			2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0		10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	12.0	38.0		12.0	38.0	38.0	25.0	58.0	58.0	12.0	45.0	45.0
Total Split (%)	10.0%	31.7%		10.0%	31.7%	31.7%	20.8%	48.3%	48.3%	10.0%	37.5%	37.5%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	34.9	29.3	120.0	33.7	26.9	26.9	20.0	60.9	60.9	53.4	46.1	46.1
Actuated g/C Ratio	0.29	0.24	1.00	0.28	0.22	0.22	0.17	0.51	0.51	0.44	0.38	0.38
v/c Ratio	1.02	0.32	0.15	0.23	0.72	0.22	0.80	0.53	0.19	0.27	0.49	0.22
Control Delay	108.8	38.0	0.2	19.7	33.7	2.4	48.2	42.3	16.8	15.6	30.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.8	38.0	0.2	19.7	33.7	2.4	48.2	42.3	16.8	15.6	30.6	5.2
LOS	F	D	A	B	C	A	D	D	B	B	C	A
Approach Delay		42.7			29.4			41.3			24.8	
Approach LOS		D			C			D			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 35.3

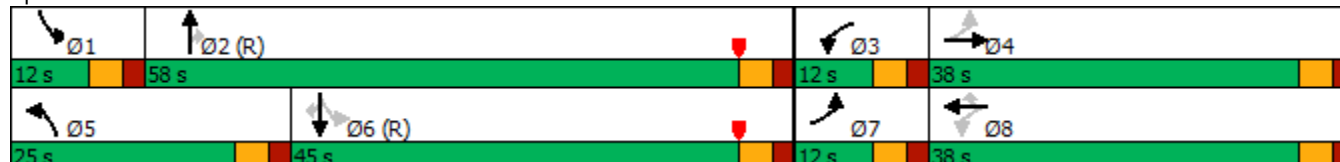
Intersection LOS: D

Intersection Capacity Utilization 69.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: S. Powhatan Road & E 6th Avenue




































# HCM 6th Signalized Intersection Summary

## 1: S. Powhatan Road & E 6th Avenue

2040 Total Traffic  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 			 	
Traffic Volume (veh/h)	162	369	212	63	758	97	419	869	156	76	608	143
Future Volume (veh/h)	162	369	212	63	758	97	419	869	156	76	608	143
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	176	401	0	68	824	105	455	945	170	83	661	155
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	196	1140		289	1056	328	516	1875	836	312	1488	664
Arrive On Green	0.06	0.22	0.00	0.04	0.21	0.21	0.15	0.53	0.53	0.04	0.42	0.42
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	176	401	0	68	824	105	455	945	170	83	661	155
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.0	7.9	0.0	3.6	18.3	6.8	15.5	20.5	6.8	3.2	15.9	7.6
Cycle Q Clear(g_c), s	7.0	7.9	0.0	3.6	18.3	6.8	15.5	20.5	6.8	3.2	15.9	7.6
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	196	1140		289	1056	328	516	1875	836	312	1488	664
V/C Ratio(X)	0.90	0.35		0.24	0.78	0.32	0.88	0.50	0.20	0.27	0.44	0.23
Avail Cap(c_a), veh/h	196	1404		318	1404	436	576	1875	836	344	1488	664
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(l)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	39.3	0.0	35.4	45.0	40.4	50.0	18.2	15.0	18.7	24.9	22.5
Incr Delay (d2), s/veh	36.9	0.2	0.0	0.4	2.1	0.6	13.8	1.0	0.5	0.4	1.0	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(50%),veh/ln	3.8	3.3	0.0	1.5	7.7	2.6	7.5	8.1	2.4	1.3	6.6	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.5	39.5	0.0	35.8	47.1	41.0	63.8	19.2	15.5	19.1	25.9	23.3
LnGrp LOS	E	D		D	D	D	E	B	B	B	C	C
Approach Vol, veh/h		577			997			1570			899	
Approach Delay, s/veh		51.7			45.7			31.7			24.8	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	68.3	10.0	31.8	22.9	55.3	12.0	29.8				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	53.0	7.0	33.0	20.0	40.0	7.0	33.0				
Max Q Clear Time (g_c+l1), s	5.2	22.5	5.6	9.9	17.5	17.9	9.0	20.3				
Green Ext Time (p_c), s	0.0	7.7	0.0	2.4	0.5	4.7	0.0	4.5				

### Intersection Summary

HCM 6th Ctrl Delay	36.5
HCM 6th LOS	D

### Notes

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



















HCM 6th TWSC  
2: N. Robertsdale St & E 6th Avenue

2040 Total Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↖	↑↑↑		↗
Traffic Vol, veh/h	589	12	11	917	0	30
Future Vol, veh/h	589	12	11	917	0	30
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, %	2	2	2	2	2	2
Mvmt Flow	640	13	12	997	0	33
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	653	0	-	327
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	5.34	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.12	-	-	3.92
Pot Cap-1 Maneuver	-	-	*985	-	0	*783
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-	1	-	-	1
Mov Cap-1 Maneuver	-	-	*985	-	-	*783
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.1		9.8	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	783	-	-	* 985	-	
HCM Lane V/C Ratio	0.042	-	-	0.012	-	
HCM Control Delay (s)	9.8	-	-	8.7	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# Timings 3: Trussville Street & E 6th Avenue

2040 Total Traffic  
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	55	551	47	736	37	20	55	10	155
Future Volume (vph)	55	551	47	736	37	20	55	10	155
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	1	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	23.0	10.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (s)	12.0	78.0	12.0	78.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	10.0%	65.0%	10.0%	65.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	94.3	89.1	94.0	89.0	11.8	11.8	11.8	11.8	11.8
Actuated g/C Ratio	0.79	0.74	0.78	0.74	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.11	0.16	0.08	0.22	0.29	0.35	0.47	0.06	0.55
Control Delay	2.4	4.0	8.0	13.2	54.9	24.3	62.3	48.2	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	4.0	8.0	13.2	54.9	24.3	62.3	48.2	14.3
LOS	A	A	A	B	D	C	E	D	B
Approach Delay		3.9		12.9		35.0		27.9	
Approach LOS		A		B		C		C	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 77 (64%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 12.9

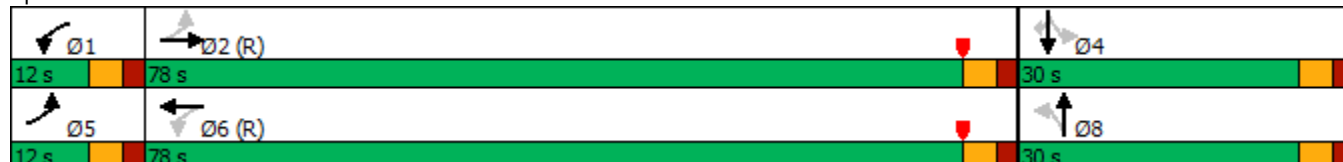
Intersection LOS: B

Intersection Capacity Utilization 45.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Trussville Street & E 6th Avenue



# HCM 6th Signalized Intersection Summary

## 3: Trussville Street & E 6th Avenue

2040 Total Traffic  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰		↰	↰↰↰		↰	↰		↰	↰	↰
Traffic Volume (veh/h)	55	551	13	47	736	20	37	20	49	55	10	155
Future Volume (veh/h)	55	551	13	47	736	20	37	20	49	55	10	155
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	599	14	51	800	22	40	22	53	60	11	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	600	3675	86	698	3648	100	204	61	147	171	234	198
Arrive On Green	0.07	1.00	1.00	0.07	1.00	1.00	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1781	5133	120	1781	5109	140	1205	487	1173	1325	1870	1585
Grp Volume(v), veh/h	60	397	216	51	533	289	40	0	75	60	11	168
Grp Sat Flow(s),veh/h/ln	1781	1702	1849	1781	1702	1845	1205	0	1659	1325	1870	1585
Q Serve(g_s), s	1.0	0.0	0.0	0.9	0.0	0.0	3.6	0.0	5.0	5.2	0.6	12.4
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.9	0.0	0.0	4.2	0.0	5.0	10.2	0.6	12.4
Prop In Lane	1.00		0.06	1.00		0.08	1.00		0.71	1.00		1.00
Lane Grp Cap(c), veh/h	600	2437	1324	698	2431	1317	204	0	207	171	234	198
V/C Ratio(X)	0.10	0.16	0.16	0.07	0.22	0.22	0.20	0.00	0.36	0.35	0.05	0.85
Avail Cap(c_a), veh/h	639	2437	1324	742	2431	1317	305	0	346	281	390	330
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.7	0.0	0.0	3.8	0.0	0.0	48.1	0.0	48.1	52.8	46.2	51.4
Incr Delay (d2), s/veh	0.1	0.1	0.3	0.0	0.2	0.4	0.5	0.0	1.1	1.2	0.1	10.2
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(50%),veh/ln	0.3	0.0	0.1	0.3	0.1	0.1	1.1	0.0	2.1	1.8	0.3	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.8	0.1	0.3	3.8	0.2	0.4	48.5	0.0	49.2	54.0	46.3	61.6
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	D	E
Approach Vol, veh/h	673			873			115			239		
Approach Delay, s/veh	0.5			0.5			49.0			59.0		
Approach LOS	A			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	90.9		20.0	9.3	90.7		20.0				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	73.0		25.0	7.0	73.0		25.0				
Max Q Clear Time (g_c+I1), s	2.9	2.0		14.4	3.0	2.0		7.0				
Green Ext Time (p_c), s	0.0	3.9		0.5	0.0	5.6		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				10.8								
HCM 6th LOS				B								

HCM 6th TWSC  
7: S. Powhaton Road & E. 3rd Avenue

2040 Total Traffic  
AM Peak Hour

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗↗	↗	↗	↗↗	
Traffic Vol, veh/h	0	0	21	0	0	29	7	1397	10	10	866	6
Future Vol, veh/h	0	0	21	0	0	29	7	1397	10	10	866	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	200	200	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	23	0	0	32	8	1518	11	11	941	7

















Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	474	-	-	759	948	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-
Pot Cap-1 Maneuver	0	0	537	0	0	349	720	-
Stage 1	0	0	-	0	0	-	-	-
Stage 2	0	0	-	0	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	537	-	-	349	720	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	16.3	0	0.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	720	-	-	537	349	432	-
HCM Lane V/C Ratio	0.011	-	-	0.043	0.09	0.025	-
HCM Control Delay (s)	10.1	-	-	12	16.3	13.5	-
HCM Lane LOS	B	-	-	B	C	B	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.1	-

Timings  
9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave

2040 Total Traffic  
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	77	10	261	10	10	1095	114	112	758
Future Volume (vph)	77	10	261	10	10	1095	114	112	758
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	23.0	23.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0
Total Split (s)	52.0	52.0	52.0	52.0	12.0	56.0	56.0	12.0	56.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	10.0%	46.7%	46.7%	10.0%	46.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		47.0		47.0	56.9	51.0	51.0	62.1	60.7
Actuated g/C Ratio		0.39		0.39	0.47	0.42	0.42	0.52	0.51
v/c Ratio		0.30		1.00	0.04	0.79	0.17	0.71	0.47
Control Delay		23.9		72.4	12.3	25.3	5.0	55.9	40.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		72.4	12.3	25.3	5.0	55.9	40.7
LOS		C		E	B	C	A	E	D
Approach Delay		23.9		72.4		23.3			42.6
Approach LOS		C		E		C			D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 38.8

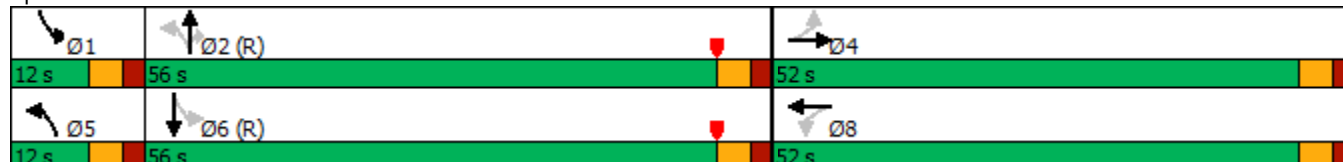
Intersection LOS: D

Intersection Capacity Utilization 81.7%

ICU Level of Service D

Analysis Period (min) 15





















Splits and Phases: 9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave





HCM 6th Signalized Intersection Summary  
9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave

2040 Total Traffic  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	10	32	261	10	242	10	1095	114	112	758	17
Future Volume (veh/h)	77	10	32	261	10	242	10	1095	114	112	758	17
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	11	35	284	11	263	11	1190	124	122	824	18
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	333	49	123	338	11	271	289	1542	688	279	1684	37
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.03	0.87	0.87	0.05	0.47	0.47
Sat Flow, veh/h	730	126	316	753	29	697	1781	3554	1585	1781	3556	78
Grp Volume(v), veh/h	130	0	0	558	0	0	11	1190	124	122	412	430
Grp Sat Flow(s),veh/h/ln	1172	0	0	1480	0	0	1781	1777	1585	1781	1777	1856
Q Serve(g_s), s	0.0	0.0	0.0	35.7	0.0	0.0	0.4	16.1	1.5	4.4	19.1	19.1
Cycle Q Clear(g_c), s	8.7	0.0	0.0	44.4	0.0	0.0	0.4	16.1	1.5	4.4	19.1	19.1
Prop In Lane	0.65		0.27	0.51		0.47	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	505	0	0	620	0	0	289	1542	688	279	842	879
V/C Ratio(X)	0.26	0.00	0.00	0.90	0.00	0.00	0.04	0.77	0.18	0.44	0.49	0.49
Avail Cap(c_a), veh/h	509	0	0	625	0	0	370	1542	688	289	842	879
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	0.0	35.8	0.0	0.0	19.1	5.6	4.6	17.9	21.6	21.6
Incr Delay (d2), s/veh	0.3	0.0	0.0	16.0	0.0	0.0	0.0	3.0	0.5	1.1	2.0	1.9
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	2.6	0.0	0.0	18.2	0.0	0.0	0.2	3.0	0.5	1.8	8.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	0.0	0.0	51.8	0.0	0.0	19.1	8.6	5.0	19.0	23.7	23.6
LnGrp LOS	C	A	A	D	A	A	B	A	A	B	C	C
Approach Vol, veh/h		130			558			1325			964	
Approach Delay, s/veh		25.2			51.8			8.3			23.0	
Approach LOS		C			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.3	57.1		51.6	6.5	61.8		51.6				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	51.0		47.0	7.0	51.0		47.0				
Max Q Clear Time (g_c+I1), s	6.4	18.1		10.7	2.4	21.1		46.4				
Green Ext Time (p_c), s	0.0	10.3		0.9	0.0	5.2		0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				22.0								
HCM 6th LOS				C								

HCM 6th Roundabout  
10: Trussville Street & E Ellsworth Avenue

2040 Total Traffic  
AM Peak Hour

Intersection				
Intersection Delay, s/veh 6.2				
Intersection LOS A				
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	341	359	230	153
Demand Flow Rate, veh/h	348	366	234	156
Vehicles Circulating, veh/h	102	244	300	532
Vehicles Exiting, veh/h	586	290	149	78
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.5	6.9	5.8	6.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	348	366	234	156
Cap Entry Lane, veh/h	1244	1076	1016	802
Entry HV Adj Factor	0.979	0.981	0.983	0.983
Flow Entry, veh/h	341	359	230	153
Cap Entry, veh/h	1218	1056	999	789
V/C Ratio	0.280	0.340	0.230	0.195
Control Delay, s/veh	5.5	6.9	5.8	6.6
LOS	A	A	A	A
95th %tile Queue, veh	1	2	1	1

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗	↗		↗↗
Traffic Vol, veh/h	0	24	1421	6	0	882
Future Vol, veh/h	0	24	1421	6	0	882
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	200	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	1545	7	0	959






Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	773	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	342	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	342	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	342
HCM Lane V/C Ratio	-	-	0.076
HCM Control Delay (s)	-	-	16.4
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.2







HCM 6th TWSC  
34: Trussville Street & 4th Pl







2040 Total Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	31	12	88	63	7
Future Vol, veh/h	19	31	12	88	63	7
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	34	13	96	68	8
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	194	72	76	0	-	0
Stage 1	72	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	795	990	1523	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	788	990	1523	-	-	-
Mov Cap-2 Maneuver	779	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.3	0.9		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1523	-	898	-	-	
HCM Lane V/C Ratio	0.009	-	0.061	-	-	
HCM Control Delay (s)	7.4	-	9.3	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 6th TWSC  
35: Trussville Street & E 3rd Ave

2040 Total Traffic  
AM Peak Hour

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	0	6	1	0	0	2	82	1	0	87	7
Future Vol, veh/h	18	0	6	1	0	0	2	82	1	0	87	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	0	7	1	0	0	2	89	1	0	95	8
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	193	193	99	197	197	90	103	0	0	90	0	0
Stage 1	99	99	-	94	94	-	-	-	-	-	-	-
Stage 2	94	94	-	103	103	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	767	702	957	762	699	968	1489	-	-	1505	-	-
Stage 1	907	813	-	913	817	-	-	-	-	-	-	-
Stage 2	913	817	-	903	810	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	766	701	957	756	698	968	1489	-	-	1505	-	-
Mov Cap-2 Maneuver	766	701	-	756	698	-	-	-	-	-	-	-
Stage 1	906	813	-	912	816	-	-	-	-	-	-	-
Stage 2	912	816	-	897	810	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.6		9.8		0.2		0					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1489	-	-	806	756	1505	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.032	0.001	-	-	-				
HCM Control Delay (s)	7.4	-	-	9.6	9.8	0	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-				

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	17	42	0	21	6	49	16	7	81	4
Future Vol, veh/h	12	0	17	42	0	21	6	49	16	7	81	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	0	18	46	0	23	7	53	17	8	88	4
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	193	190	90	191	184	62	92	0	0	70	0	0
Stage 1	106	106	-	76	76	-	-	-	-	-	-	-
Stage 2	87	84	-	115	108	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	767	705	968	769	710	1003	1503	-	-	1531	-	-
Stage 1	900	807	-	933	832	-	-	-	-	-	-	-
Stage 2	921	825	-	890	806	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	744	698	968	749	703	1003	1503	-	-	1531	-	-
Mov Cap-2 Maneuver	744	698	-	749	703	-	-	-	-	-	-	-
Stage 1	896	803	-	928	828	-	-	-	-	-	-	-
Stage 2	896	821	-	868	802	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.3		9.8		0.6		0.6					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1503	-	-	861	818	1531	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.037	0.084	0.005	-	-				
HCM Control Delay (s)	7.4	-	-	9.3	9.8	7.4	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-				



























HCM 6th Roundabout  
38: N. Robertsdale St & E Ellsworth Ave

2040 Total Traffic  
AM Peak Hour

Intersection				
Intersection Delay, s/veh	5.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	255	438	72	87
Demand Flow Rate, veh/h	260	446	73	88
Vehicles Circulating, veh/h	38	72	255	508
Vehicles Exiting, veh/h	558	256	43	10
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.4	6.1	4.0	5.5
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	260	446	73	88
Cap Entry Lane, veh/h	1327	1282	1064	822
Entry HV Adj Factor	0.982	0.981	0.986	0.988
Flow Entry, veh/h	255	438	72	87
Cap Entry, veh/h	1304	1258	1049	812
V/C Ratio	0.196	0.348	0.069	0.107
Control Delay, s/veh	4.4	6.1	4.0	5.5
LOS	A	A	A	A
95th %tile Queue, veh	1	2	0	0

Timings  
1: S. Powhaton Road & E 6th Avenue

2040 Total Traffic  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	744	515	79	488	82	318	671	131	119	1177	187
Future Volume (vph)	157	744	515	79	488	82	318	671	131	119	1177	187
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8			2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0		10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	12.0	38.0		12.0	38.0	38.0	20.0	58.0	58.0	12.0	50.0	50.0
Total Split (%)	10.0%	31.7%		10.0%	31.7%	31.7%	16.7%	48.3%	48.3%	10.0%	41.7%	41.7%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	32.5	26.9	120.0	31.4	24.5	24.5	16.6	59.9	59.9	60.6	52.0	52.0
Actuated g/C Ratio	0.27	0.22	1.00	0.26	0.20	0.20	0.14	0.50	0.50	0.50	0.43	0.43
v/c Ratio	0.75	0.71	0.35	0.51	0.51	0.20	0.73	0.41	0.16	0.32	0.83	0.26
Control Delay	54.4	46.7	0.6	36.8	40.1	5.5	44.4	37.5	16.3	14.0	37.6	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	46.7	0.6	36.8	40.1	5.5	44.4	37.5	16.3	14.0	37.6	5.3
LOS	D	D	A	D	D	A	D	D	B	B	D	A
Approach Delay		30.8			35.3			37.0			31.7	
Approach LOS		C			D			D			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 33.2

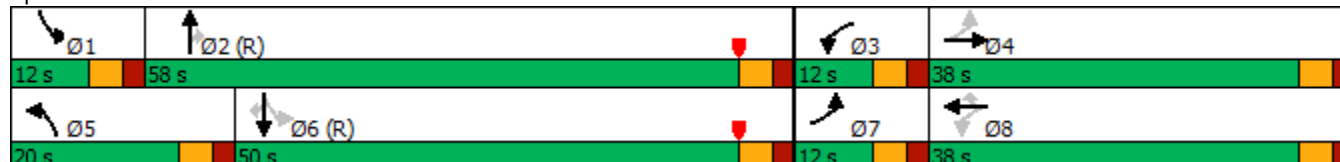
Intersection LOS: C

Intersection Capacity Utilization 77.0%

ICU Level of Service D

Analysis Period (min) 15
































Splits and Phases: 1: S. Powhaton Road & E 6th Avenue



# HCM 6th Signalized Intersection Summary

## 1: S. Powhatan Road & E 6th Avenue

2040 Total Traffic  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 			 	
Traffic Volume (veh/h)	157	744	515	79	488	82	318	671	131	119	1177	187
Future Volume (veh/h)	157	744	515	79	488	82	318	671	131	119	1177	187
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	171	809	0	86	530	89	346	729	142	129	1279	203
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	249	1030		187	996	309	402	1870	834	413	1647	735
Arrive On Green	0.06	0.20	0.00	0.07	0.26	0.26	0.12	0.53	0.53	0.05	0.46	0.46
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	171	809	0	86	530	89	346	729	142	129	1279	203
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.0	18.0	0.0	4.6	10.7	5.4	11.8	14.7	5.6	4.5	36.2	9.5
Cycle Q Clear(g_c), s	7.0	18.0	0.0	4.6	10.7	5.4	11.8	14.7	5.6	4.5	36.2	9.5
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	249	1030		187	996	309	402	1870	834	413	1647	735
V/C Ratio(X)	0.69	0.79		0.46	0.53	0.29	0.86	0.39	0.17	0.31	0.78	0.28
Avail Cap(c_a), veh/h	249	1404		199	1404	436	432	1870	834	421	1647	735
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.7	45.4	0.0	36.5	39.7	37.8	52.1	16.9	14.8	15.3	27.0	19.8
Incr Delay (d2), s/veh	7.6	2.1	0.0	1.8	0.4	0.5	15.3	0.6	0.4	0.4	3.7	0.9
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	1.8	7.6	0.0	2.0	4.2	2.0	5.8	5.8	2.0	1.8	15.1	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.3	47.5	0.0	38.3	40.2	38.3	67.4	17.6	15.2	15.8	30.6	20.7
LnGrp LOS	D	D		D	D	D	E	B	B	B	C	C
Approach Vol, veh/h		980			705			1217			1611	
Approach Delay, s/veh		47.7			39.7			31.4			28.2	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.4	68.1	11.2	29.2	19.0	60.6	12.0	28.4				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	53.0	7.0	33.0	15.0	45.0	7.0	33.0				
Max Q Clear Time (g_c+I1), s	6.5	16.7	6.6	20.0	13.8	38.2	9.0	12.7				
Green Ext Time (p_c), s	0.0	5.7	0.0	4.2	0.2	4.5	0.0	3.5				

### Intersection Summary

HCM 6th Ctrl Delay	35.1
HCM 6th LOS	D

### Notes

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



















HCM 6th TWSC  
2: N. Robertsdale St & E 6th Avenue

2040 Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↱	↑↑↑		↱
Traffic Vol, veh/h	954	40	42	649	0	25
Future Vol, veh/h	954	40	42	649	0	25
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, %	2	2	2	2	2	2
Mvmt Flow	1037	43	46	705	0	27
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1080	0	-	540
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	5.34	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.12	-	-	3.92
Pot Cap-1 Maneuver	-	-	*876	-	0	*697
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-	1	-	-	1
Mov Cap-1 Maneuver	-	-	*876	-	-	*697
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.6		10.4	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	697	-	-	* 876	-	
HCM Lane V/C Ratio	0.039	-	-	0.052	-	
HCM Control Delay (s)	10.4	-	-	9.3	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# Timings 3: Trussville Street & E 6th Avenue

2040 Total Traffic  
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	195	736	68	549	32	15	40	30	110
Future Volume (vph)	195	736	68	549	32	15	40	30	110
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	1	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	5.0	15.0	5.0	15.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	23.0	10.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (s)	12.0	78.0	12.0	78.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	10.0%	65.0%	10.0%	65.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	96.9	89.8	92.1	85.7	10.9	10.9	10.9	10.9	10.9
Actuated g/C Ratio	0.81	0.75	0.77	0.71	0.09	0.09	0.09	0.09	0.09
v/c Ratio	0.33	0.23	0.14	0.18	0.28	0.38	0.36	0.20	0.48
Control Delay	9.1	2.8	2.9	4.1	56.5	22.9	59.8	52.8	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	2.8	2.9	4.1	56.5	22.9	59.8	52.8	15.3
LOS	A	A	A	A	E	C	E	D	B
Approach Delay		4.1		4.0		33.4		31.4	
Approach LOS		A		A		C		C	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 77 (64%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 8.1

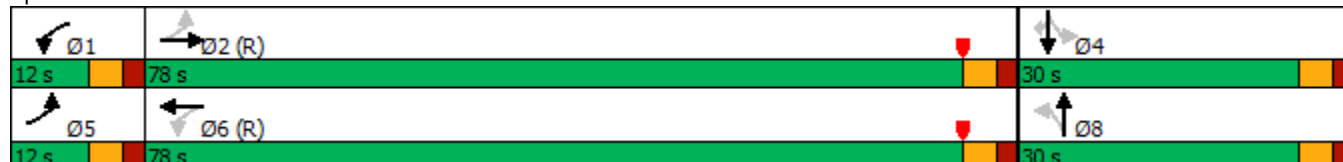
Intersection LOS: A

Intersection Capacity Utilization 44.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Trussville Street & E 6th Avenue



# HCM 6th Signalized Intersection Summary

## 3: Trussville Street & E 6th Avenue

2040 Total Traffic  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	736	49	68	549	55	32	15	56	40	30	110
Future Volume (veh/h)	195	736	49	68	549	55	32	15	56	40	30	110
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	212	800	53	74	597	60	35	16	61	43	33	120
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	714	3619	239	599	3434	342	160	33	126	130	182	154
Arrive On Green	0.10	1.00	1.00	0.08	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1781	4893	323	1781	4720	470	1234	340	1297	1322	1870	1585
Grp Volume(v), veh/h	212	556	297	74	429	228	35	0	77	43	33	120
Grp Sat Flow(s),veh/h/ln	1781	1702	1812	1781	1702	1786	1234	0	1637	1322	1870	1585
Q Serve(g_s), s	3.9	0.0	0.0	1.2	0.0	0.0	3.2	0.0	5.3	3.8	1.9	8.9
Cycle Q Clear(g_c), s	3.9	0.0	0.0	1.2	0.0	0.0	5.2	0.0	5.3	9.2	1.9	8.9
Prop In Lane	1.00		0.18	1.00		0.26	1.00		0.79	1.00		1.00
Lane Grp Cap(c), veh/h	714	2517	1340	599	2477	1299	160	0	159	130	182	154
V/C Ratio(X)	0.30	0.22	0.22	0.12	0.17	0.18	0.22	0.00	0.48	0.33	0.18	0.78
Avail Cap(c_a), veh/h	729	2517	1340	635	2477	1299	297	0	341	277	390	330
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.2	0.0	0.0	3.3	0.0	0.0	52.1	0.0	51.3	55.6	49.8	52.9
Incr Delay (d2), s/veh	0.2	0.2	0.4	0.1	0.1	0.3	0.7	0.0	2.3	1.5	0.5	8.1
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	0.9	0.1	0.1	0.3	0.1	0.1	1.0	0.0	2.3	1.3	0.9	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.5	0.2	0.4	3.4	0.1	0.3	52.8	0.0	53.6	57.1	50.2	61.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	E	D	E
Approach Vol, veh/h	1065				731				112		196	
Approach Delay, s/veh	0.9				0.5				53.3		58.4	
Approach LOS	A				A				D		E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	93.7		16.7	11.0	92.3		16.7				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	73.0		25.0	7.0	73.0		25.0				
Max Q Clear Time (g_c+I1), s	3.2	2.0		11.2	5.9	2.0		7.3				
Green Ext Time (p_c), s	0.0	5.9		0.5	0.1	4.3		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	8.9											
HCM 6th LOS	A											



HCM 6th TWSC  
7: S. Powhaton Road & E. 3rd Avenue

2040 Total Traffic  
PM Peak Hour

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗↗	↗	↗	↗↗	
Traffic Vol, veh/h	0	0	13	0	0	23	24	1097	39	37	1715	19
Future Vol, veh/h	0	0	13	0	0	23	24	1097	39	37	1715	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	200	200	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	14	0	0	25	26	1192	42	40	1864	21

















Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	943	-	-	596	1885	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-
Pot Cap-1 Maneuver	0	0	264	0	0	447	314	-
Stage 1	0	0	-	0	0	-	-	-
Stage 2	0	0	-	0	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	264	-	-	447	314	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.4	13.5	0.4	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	314	-	-	264	447	560	-
HCM Lane V/C Ratio	0.083	-	-	0.054	0.056	0.072	-
HCM Control Delay (s)	17.5	-	-	19.4	13.5	11.9	-
HCM Lane LOS	C	-	-	C	B	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	0.2	0.2	-

Timings  
9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave

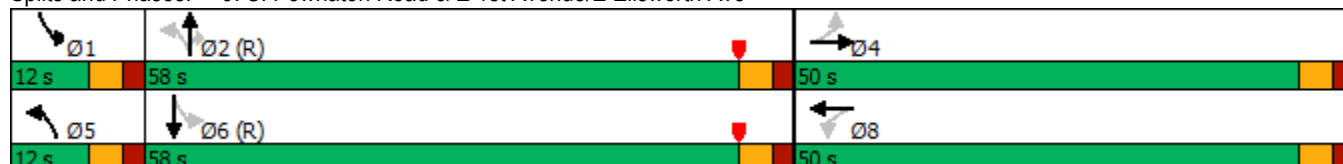
2040 Total Traffic  
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	46	5	170	5	36	969	191	246	1416
Future Volume (vph)	46	5	170	5	36	969	191	246	1416
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	23.0	23.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0
Total Split (s)	50.0	50.0	50.0	50.0	12.0	58.0	58.0	12.0	58.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	10.0%	48.3%	48.3%	10.0%	48.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		32.8		32.8	59.9	53.3	53.3	76.3	69.9
Actuated g/C Ratio		0.27		0.27	0.50	0.44	0.44	0.64	0.58
v/c Ratio		0.22		0.85	0.24	0.67	0.26	0.67	0.79
Control Delay		24.5		54.0	21.5	30.0	10.1	34.8	42.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		24.5		54.0	21.5	30.0	10.1	34.8	42.4
LOS		C		D	C	C	B	C	D
Approach Delay		24.5		54.0		26.6			41.3
Approach LOS		C		D		C			D

Intersection Summary

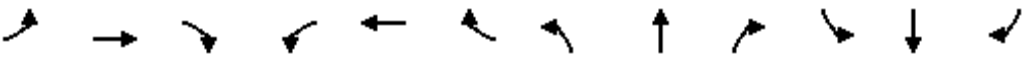
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 36.8
Intersection Capacity Utilization 78.5%
Analysis Period (min) 15
Intersection LOS: D
ICU Level of Service D

Splits and Phases: 9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave



HCM 6th Signalized Intersection Summary  
9: S. Powhatan Road & E 1st Avenue/E Ellsworth Ave

2040 Total Traffic  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↕	↕	↔	↕	↕
Traffic Volume (veh/h)	46	5	20	170	5	146	36	969	191	246	1416	66
Future Volume (veh/h)	46	5	20	170	5	146	36	969	191	246	1416	66
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	5	22	185	5	159	39	1053	208	267	1539	72
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	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	31	90	250	6	176	195	1994	889	411	2037	95
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.06	1.00	1.00	0.06	0.59	0.59
Sat Flow, veh/h	759	121	352	798	23	688	1781	3554	1585	1781	3457	161
Grp Volume(v), veh/h	77	0	0	349	0	0	39	1053	208	267	788	823
Grp Sat Flow(s),veh/h/ln	1231	0	0	1509	0	0	1781	1777	1585	1781	1777	1841
Q Serve(g_s), s	0.0	0.0	0.0	21.2	0.0	0.0	1.1	0.0	0.0	7.0	39.3	39.8
Cycle Q Clear(g_c), s	5.6	0.0	0.0	26.8	0.0	0.0	1.1	0.0	0.0	7.0	39.3	39.8
Prop In Lane	0.65		0.29	0.53		0.46	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	364	0	0	432	0	0	195	1994	889	411	1047	1085
V/C Ratio(X)	0.21	0.00	0.00	0.81	0.00	0.00	0.20	0.53	0.23	0.65	0.75	0.76
Avail Cap(c_a), veh/h	524	0	0	608	0	0	245	1994	889	411	1047	1085
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	0.00	0.74	0.74	0.74	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	0.0	0.0	42.9	0.0	0.0	16.0	0.0	0.0	10.3	18.2	18.3
Incr Delay (d2), s/veh	0.3	0.0	0.0	5.5	0.0	0.0	0.4	0.7	0.5	3.6	5.0	5.0
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	1.8	0.0	0.0	10.5	0.0	0.0	0.4	0.2	0.1	3.2	15.8	16.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	0.0	0.0	48.5	0.0	0.0	16.4	0.7	0.5	13.9	23.2	23.3
LnGrp LOS	D	A	A	D	A	A	B	A	A	B	C	C
Approach Vol, veh/h	77			349			1300			1878		
Approach Delay, s/veh	35.5			48.5			1.2			21.9		
Approach LOS	D			D			A			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	72.3		35.7	8.6	75.7		35.7				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	53.0		45.0	7.0	53.0		45.0				
Max Q Clear Time (g_c+I1), s	9.0	2.0		7.6	3.1	41.8		28.8				
Green Ext Time (p_c), s	0.0	9.8		0.5	0.0	7.4		1.9				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				17.3								
HCM 6th LOS				B								

HCM 6th Roundabout  
10: Trussville Street & E Ellsworth Avenue

2040 Total Traffic  
PM Peak Hour

Intersection				
Intersection Delay, s/veh 5.6				
Intersection LOS A				
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	409	244	165	114
Demand Flow Rate, veh/h	418	248	168	116
Vehicles Circulating, veh/h	114	188	329	297
Vehicles Exiting, veh/h	299	309	203	139
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.2	5.2	5.3	4.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	418	248	168	116
Cap Entry Lane, veh/h	1228	1139	987	1019
Entry HV Adj Factor	0.980	0.983	0.984	0.986
Flow Entry, veh/h	409	244	165	114
Cap Entry, veh/h	1203	1120	970	1005
V/C Ratio	0.340	0.218	0.170	0.114
Control Delay, s/veh	6.2	5.2	5.3	4.6
LOS	A	A	A	A
95th %tile Queue, veh	2	1	1	0

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗	↗		↗↗
Traffic Vol, veh/h	0	19	1102	18	0	1772
Future Vol, veh/h	0	19	1102	18	0	1772
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	200	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	1198	20	0	1926





Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	599	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	445	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	445	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	445
HCM Lane V/C Ratio	-	-	0.046
HCM Control Delay (s)	-	-	13.5
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

HCM 6th TWSC  
34: Trussville Street & 4th Pl

2040 Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	17	21	86	124	22
Future Vol, veh/h	16	17	21	86	124	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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	18	23	93	135	24

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	286	147	159	0	-	0
Stage 1	147	-	-	-	-	-
Stage 2	139	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	704	900	1420	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	693	900	1420	-	-	-
Mov Cap-2 Maneuver	716	-	-	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1420	-	800	-	-
HCM Lane V/C Ratio	0.016	-	0.045	-	-
HCM Control Delay (s)	7.6	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



HCM 6th TWSC  
35: Trussville Street & E 3rd Ave

2040 Total Traffic  
PM Peak Hour

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↱	↰		↱	↰	
Traffic Vol, veh/h	15	0	4	6	0	4	7	88	8	5	112	24
Future Vol, veh/h	15	0	4	6	0	4	7	88	8	5	112	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	200	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	4	7	0	4	8	96	9	5	122	26
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	264	266	135	264	275	101	148	0	0	105	0	0
Stage 1	145	145	-	117	117	-	-	-	-	-	-	-
Stage 2	119	121	-	147	158	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	689	640	914	689	632	954	1434	-	-	1486	-	-
Stage 1	858	777	-	888	799	-	-	-	-	-	-	-
Stage 2	885	796	-	856	767	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	681	634	914	681	626	954	1434	-	-	1486	-	-
Mov Cap-2 Maneuver	681	634	-	681	626	-	-	-	-	-	-	-
Stage 1	853	775	-	883	794	-	-	-	-	-	-	-
Stage 2	876	791	-	849	765	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.1		9.7		0.5		0.3					
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1434	-	-	720	769	1486	-	-				
HCM Lane V/C Ratio	0.005	-	-	0.029	0.014	0.004	-	-				
HCM Control Delay (s)	7.5	-	-	10.1	9.7	7.4	-	-				
HCM Lane LOS	A	-	-	B	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-				

HCM 6th TWSC  
37: Trussville Street & E 2nd PI

2040 Total Traffic  
PM Peak Hour

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	11	0	10	20	0	17	17	78	35	29	54	17
Future Vol, veh/h	11	0	10	20	0	17	17	78	35	29	54	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	11	22	0	18	18	85	38	32	59	18

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	281	291	68	278	281	104	77	0	0	123	0	0
Stage 1	132	132	-	140	140	-	-	-	-	-	-	-
Stage 2	149	159	-	138	141	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	671	619	995	674	627	951	1522	-	-	1464	-	-
Stage 1	871	787	-	863	781	-	-	-	-	-	-	-
Stage 2	854	766	-	865	780	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	641	598	995	650	606	951	1522	-	-	1464	-	-
Mov Cap-2 Maneuver	641	598	-	650	606	-	-	-	-	-	-	-
Stage 1	861	770	-	853	772	-	-	-	-	-	-	-
Stage 2	828	757	-	837	763	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.8		10		1		2.2	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1522	-	-	772 761	1464	-	-
HCM Lane V/C Ratio	0.012	-	-	0.03 0.053	0.022	-	-
HCM Control Delay (s)	7.4	-	-	9.8 10	7.5	-	-
HCM Lane LOS	A	-	-	A B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0.2	0.1	-	-

HCM 6th Roundabout  
38: N. Robertsdale St & E Ellsworth Ave

2040 Total Traffic  
PM Peak Hour











Intersection				
Intersection Delay, s/veh	5.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	470	277	60	66
Demand Flow Rate, veh/h	479	282	61	67
Vehicles Circulating, veh/h	30	71	401	313
Vehicles Exiting, veh/h	350	391	108	40
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.1	4.8	4.6	4.2
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	479	282	61	67
Cap Entry Lane, veh/h	1338	1283	917	1003
Entry HV Adj Factor	0.981	0.983	0.983	0.985
Flow Entry, veh/h	470	277	60	66
Cap Entry, veh/h	1312	1262	901	987
V/C Ratio	0.358	0.220	0.067	0.067
Control Delay, s/veh	6.1	4.8	4.6	4.2
LOS	A	A	A	A
95th %tile Queue, veh	2	1	0	0

## Queues

1: S. Powhaton Rd &amp; E 6th Avenue

2024 Total Traffic

AM Peak Hour

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	98	22	113	1	43	273	596	5	14	393
v/c Ratio	0.36	0.06	0.28	0.00	0.12	0.45	0.49	0.00	0.03	0.58
Control Delay	24.3	20.1	7.5	20.0	15.9	7.4	9.5	0.0	4.7	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	20.1	7.5	20.0	15.9	7.4	9.5	0.0	4.7	15.6
Queue Length 50th (ft)	22	5	0	0	6	29	77	0	1	80
Queue Length 95th (ft)	81	26	39	4	35	74	290	0	7	168
Internal Link Dist (ft)	929			1171			589			841
Turn Bay Length (ft)	200		200	200		200		200	200	
Base Capacity (vph)	784	1075	961	799	1025	611	1635	1399	589	1579
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	0.13	0.02	0.12	0.00	0.04	0.45	0.36	0.00	0.02	0.25
Intersection Summary										

Queues  
9: NB S. Powhatan Rd & E. Ellsworth Ave

2024 Total Traffic  
AM Peak Hour



Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	130	430	11	461	28	142	277
v/c Ratio	0.29	0.71	0.03	0.54	0.06	0.35	0.21
Control Delay	13.7	21.4	8.5	20.5	0.3	11.4	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	21.4	8.5	20.5	0.3	11.4	11.5
Queue Length 50th (ft)	24	92	2	69	0	26	25
Queue Length 95th (ft)	65	#248	8	104	0	51	61
Internal Link Dist (ft)	455	736		1585			1252
Turn Bay Length (ft)			350		250	250	
Base Capacity (vph)	456	608	463	3230	1452	412	3200
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.71	0.02	0.14	0.02	0.34	0.09

Intersection Summary











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

## Queues

## 1: S. Powhaton Rd &amp; E 6th Avenue

2024 Total Traffic

PM Peak Hour

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	200	74	262	1	36	225	489	17	47	886
v/c Ratio	0.98	0.26	0.56	0.00	0.19	0.91	0.43	0.02	0.08	0.90
Control Delay	91.6	31.8	9.6	24.0	27.2	59.1	12.8	0.0	6.0	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.6	31.8	9.6	24.0	27.2	59.1	12.8	0.0	6.0	32.3
Queue Length 50th (ft)	91	31	0	0	12	68	146	0	7	383
Queue Length 95th (ft)	#204	76	65	4	38	#238	282	0	23	#762
Internal Link Dist (ft)	929			1171			589			841
Turn Bay Length (ft)	200		200	200		200		200	200	
Base Capacity (vph)	204	392	540	203	374	248	1140	1025	590	983
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	0.98	0.19	0.49	0.00	0.10	0.91	0.43	0.02	0.08	0.90

## Intersection Summary

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

Queue shown is maximum after two cycles.

Queues  
9: NB S. Powhatan Rd & E. Ellsworth Ave

2024 Total Traffic  
PM Peak Hour



Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	77	288	39	541	84	276	604
v/c Ratio	0.21	0.64	0.09	0.54	0.17	0.61	0.39
Control Delay	13.6	19.8	7.6	18.1	5.2	16.2	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	19.8	7.6	18.1	5.2	16.2	12.5
Queue Length 50th (ft)	13	54	5	70	0	41	46
Queue Length 95th (ft)	43	135	19	121	24	#104	132
Internal Link Dist (ft)	455	736		1585			1252
Turn Bay Length (ft)			350		250	250	
Base Capacity (vph)	521	622	470	3468	1553	454	3407
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.46	0.08	0.16	0.05	0.61	0.18

Intersection Summary

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















## Queues

2040 Total Traffic

## 1: S. Powhaton Road &amp; E 6th Avenue

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	176	401	230	68	824	105	455	945	170	83	661	155
v/c Ratio	1.02	0.32	0.15	0.23	0.72	0.22	0.80	0.53	0.19	0.27	0.49	0.22
Control Delay	108.8	38.0	0.2	19.7	33.7	2.4	48.2	42.3	16.8	15.6	30.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.8	38.0	0.2	19.7	33.7	2.4	48.2	42.3	16.8	15.6	30.6	5.2
Queue Length 50th (ft)	~106	95	0	28	132	0	182	372	43	26	206	0
Queue Length 95th (ft)	#209	120	0	46	145	3	m230	m446	m74	55	281	46
Internal Link Dist (ft)	1198			1167			512			1102		
Turn Bay Length (ft)	300		300	300		300	300		300	300		300
Base Capacity (vph)	173	1398	1583	302	1398	547	597	1797	887	306	1360	703
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	0.29	0.15	0.23	0.59	0.19	0.76	0.53	0.19	0.27	0.49	0.22

## 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.

Queues  
3: Trussville Street & E 6th Avenue

2040 Total Traffic  
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	613	51	822	40	75	60	11	168
v/c Ratio	0.11	0.16	0.08	0.22	0.29	0.35	0.47	0.06	0.55
Control Delay	2.4	4.0	8.0	13.2	54.9	24.3	62.3	48.2	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	4.0	8.0	13.2	54.9	24.3	62.3	48.2	14.3
Queue Length 50th (ft)	6	38	16	129	30	16	45	8	0
Queue Length 95th (ft)	14	64	37	169	63	61	88	26	65
Internal Link Dist (ft)	1039			1375		490		562	
Turn Bay Length (ft)	200		200		200		200		200
Base Capacity (vph)	545	3765	659	3757	291	388	274	388	462
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	0.11	0.16	0.08	0.22	0.14	0.19	0.22	0.03	0.36
Intersection Summary									

## Queues

## 9: S. Powhaton Road &amp; E 1st Avenue/E Ellsworth Ave

2040 Total Traffic

AM Peak Hour



Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	130	558	11	1190	124	122	842
v/c Ratio	0.30	1.00	0.04	0.79	0.17	0.71	0.47
Control Delay	23.9	72.4	12.3	25.3	5.0	55.9	40.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	72.4	12.3	25.3	5.0	55.9	40.7
Queue Length 50th (ft)	58	403	3	243	6	85	323
Queue Length 95th (ft)	110	#650	m7	m325	m37	#140	410
Internal Link Dist (ft)	758	464		1989			1823
Turn Bay Length (ft)			200		200	200	
Base Capacity (vph)	431	558	317	1504	726	172	1785
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.00	0.03	0.79	0.17	0.71	0.47

## 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.

## Queues

2040 Total Traffic

## 1: S. Powhaton Road &amp; E 6th Avenue

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	809	560	86	530	89	346	729	142	129	1279	203
v/c Ratio	0.75	0.71	0.35	0.51	0.51	0.20	0.73	0.41	0.16	0.32	0.83	0.26
Control Delay	54.4	46.7	0.6	36.8	40.1	5.5	44.4	37.5	16.3	14.0	37.6	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	46.7	0.6	36.8	40.1	5.5	44.4	37.5	16.3	14.0	37.6	5.3
Queue Length 50th (ft)	100	215	0	53	124	0	137	284	34	41	473	7
Queue Length 95th (ft)	#153	249	0	86	142	13	194	347	m89	77	#659	57
Internal Link Dist (ft)	1198			1167			512			1102		
Turn Bay Length (ft)	300		300	300		300	300		300	300		300
Base Capacity (vph)	228	1398	1583	170	1398	547	484	1767	861	408	1532	792
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	0.75	0.58	0.35	0.51	0.38	0.16	0.71	0.41	0.16	0.32	0.83	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.

Queues  
3: Trussville Street & E 6th Avenue

2040 Total Traffic  
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	212	853	74	657	35	77	43	33	120
v/c Ratio	0.33	0.23	0.14	0.18	0.28	0.38	0.36	0.20	0.48
Control Delay	9.1	2.8	2.9	4.1	56.5	22.9	59.8	52.8	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	2.8	2.9	4.1	56.5	22.9	59.8	52.8	15.3
Queue Length 50th (ft)	31	34	5	35	26	12	32	24	0
Queue Length 95th (ft)	98	57	21	59	59	58	69	56	57
Internal Link Dist (ft)	1039		1375		490		562		
Turn Bay Length (ft)	200		200		200		200		200
Base Capacity (vph)	640	3777	528	3587	285	390	274	388	424
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	0.33	0.23	0.14	0.18	0.12	0.20	0.16	0.09	0.28
Intersection Summary									

## Queues

## 9: S. Powhatan Road &amp; E 1st Avenue/E Ellsworth Ave

2040 Total Traffic

PM Peak Hour



Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	77	349	39	1053	208	267	1611
v/c Ratio	0.22	0.85	0.24	0.67	0.26	0.67	0.79
Control Delay	24.5	54.0	21.5	30.0	10.1	34.8	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	54.0	21.5	30.0	10.1	34.8	42.4
Queue Length 50th (ft)	34	229	13	240	16	175	672
Queue Length 95th (ft)	66	308	m26	334	75	m#272	#864
Internal Link Dist (ft)	758	464		1989			1823
Turn Bay Length (ft)			200		200	200	
Base Capacity (vph)	469	552	169	1573	804	396	2049
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.63	0.23	0.67	0.26	0.67	0.79

## 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.