



LSC TRANSPORTATION CONSULTANTS, INC.

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July 16, 2021

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

Re: Harmony Phase 4
Aurora, CO
LSC #200710

Dear Mr. Spehalski:

In response to your request, LSC Transportation Consultants, Inc. has prepared this updated traffic impact analysis for the proposed Harmony Phase 4 development. As shown on Figure 1, the site is located south of E. Alameda Avenue and east of 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 a traffic impact study (TIS) for the entire Harmony Master Plan dated March 9, 2017. LSC also prepared site-specific traffic reports for the ASP Harmony Ridge P-8 School, dated October 12, 2018, and Harmony Phase 3, dated November 4, 2020.

LAND USE AND ACCESS

Table 1 shows a comparison of the land uses assumed in the 2017 Master TIS and the existing, approved, currently proposed, and currently anticipated future land uses. Since completion of the Master TIS, Harmony Phases 1 and 2, which were included in the Master TIS as Planning Areas 1 and 2, have been approved and a majority of the homes within Phase 1 have been constructed. APS Harmony Ridge P-8 school, which was included in the Master TIS as Planning Area 17, and the Harmony Community Center, which was included in the Master TIS as

Planning Area 19, have also been constructed. Harmony Phase 3, which was included in the Master TIA as a portion of Planning Areas 3 and 4, has recently been approved.

The area currently proposed as Harmony Phase 4 was included in the Master TIS as Planning Areas 5, 6, 7, 11, 12, and 18. The Master TIS assumed these planning areas would be developed with 580 single-family homes, 115 townhomes, and a K-8 school. The site is currently proposed to include about 743 residential dwelling units including 200 carriage homes and 543 single-family detached homes. The school site formerly shown on the northwest corner of the intersection of Trussville Road/E. Exposition Avenue has been moved to the southeast corner of this intersection and is not included as part of the currently proposed Harmony Phase 4. Figure 2a shows the conceptual site plan. Figure 2b shows the proposed roadway classifications.

Access is proposed from several locations to E. Alameda Avenue, E. Exposition Avenue, S. Powhatan Road, Trussville Road, and Monaghan Road. The access plan is generally consistent with the access assumed in the Master TIS except for the access to Powhatan Road. The Master TIS assumed a right-in/right-out-only access to Powhatan Road between Planning Areas 5 and 6 and no connection to the full movement access assumed for the 20-acre future commercial parcel located on the southeast corner of Powhatan Road and E. Alameda Avenue that is not a part of the Harmony development. The current plan no longer includes the right-in/right-out access and assumes the full movement intersection to Powhatan Road (#6) south of the future commercial parcel which will be shared with the Harmony development.

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 is planned to be widened to a six-lane major arterial roadway by 2040. In the vicinity of the site it is currently a two-lane roadway except for a section from just south of Alameda Avenue to just north of E. 1st Avenue where the east half of the final cross-section has been constructed. This half section is planned to be extended to just south of E. Exposition Avenue as part of Harmony Phase 4.
- **Monaghan Road** is planned as a future north-south, six lane arterial roadway east of the site per the *Aurora Northeast Area Transportation Study* (NEATS). The west half of Monaghan Road is planned to be constructed between E. Exposition Avenue and E. Alameda Avenue as part of the currently proposed Harmony Phase 4. The existing Airpark/Monaghan Road I-70 interchange is currently going through a Federal 1601 process with CDOT and FHWA to plan for the future reconstruction of the interchange to serve long-term needs.
- **E. Alameda Avenue** is an east-west, four-lane minor arterial roadway north of the site. The north half of E. Alameda Avenue has been constructed between Powhatan Road and Trussville Road. E. As part of the currently proposed Harmony Phase 4, E. Alameda Avenue will be constructed to its final cross-section between Powhatan Road and Waterloo

Street South and the south half of the cross-section will be constructed between Waterloo Street South and Monaghan Road.

- **E. Exposition Avenue** is an east-west, two-lane collector roadway south of the site. The north half of the final E. Exposition Avenue cross-section will be constructed between Powhaton Road and Monaghan Road with two travel lanes as part of the currently proposed Harmony Phase 4.
- **Trussville Road** is north-south, two-lane collector roadway that currently extends from E. Alameda Avenue to E. 1st Avenue. Trussville Road will be extended south to E. Exposition Avenue as part of Harmony Phase 4. The intersections with E. Alameda Avenue and E. Exposition Avenue are planned as modern roundabouts.

Figure 2b shows the proposed roadway classifications.

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 daily traffic volumes are based on the attached traffic counts conducted by Counter Measures in November, 2020.

Pandemic Adjustment

These traffic counts may have been impacted by the ongoing pandemic, however, based on the attached counts conducted at the intersection of Powhaton Road and E. 6th Avenue in May 2020 and again in November 2020 it appears that traffic patterns in the vicinity of the site have returned closer to the pre-pandemic condition. The City of Aurora Traffic Engineering approved a COVID-19 adjustment factor of 1.4 to be applied to the traffic counts conducted in May 2020 as part of the JAMASO traffic impact study completed by LSC Transportation Consultants, Inc. This adjustment factor was based on the attached data collected by the City at several arterial intersections in March 2019 and April 2020. As shown on Appendix Table 1 the calculated growth factor for the section of N. Powhaton Road south of E. 6th Avenue between May 2020 and November 2021 was 1.5. This is consistent with a six-months growth factor of 1.01 (based on the typical 2 percent annual growth rate used by the City of Aurora) plus a COVID-19 adjustment factor of 1.4.

2024 and 2040 Background Traffic

Figure 4 shows the estimated 2024 background traffic based a two percent annual growth rate for through traffic on N. Powhaton Road plus estimates of additional traffic projected to be generated by buildout of Harmony Phases 1 through 3 located north of the currently proposed Phase 4 and Phase 1 of the Sky Ranch development located south of I-70 between Powhaton Road and Hayesmount Road. Appendix Figures 1 through 6 show the traffic projected to be generated by these developments. The relevant pages from the referenced traffic impact studies are also attached. The 2024 background traffic volumes assume E. Alameda Avenue and E. Exposition Avenue have not been constructed east to Monaghan Road and Monaghan Road has not been constructed north of E. Alameda Avenue or south of E. Exposition Avenue.

Figure 5 shows the estimated 2040 background traffic based on recent NEATS modeling updates and the Master Traffic Studies for Harmony and Sky Ranch. Figures 4 and 5 also show the estimated 2024 and 2040 lane geometries and traffic controls in the vicinity of the site.

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 4 and 5 were analyzed to determine the 2024 and 2040 background levels of service using Synchro. Table 2 shows the level of service analysis results. The level of service reports are attached.

- 1. Powhaton Road/E. Alameda Avenue:** This intersection is projected to operate at LOS “C” or better for all movements through 2024 as a two-stage, stop-sign controlled “T” intersection. By 2040 it was assumed that Powhaton Road would be constructed to its final six-lane cross-section and that the intersection with E. Alameda Avenue would be converted to traffic signal control. Powhaton Road/E. Alameda Avenue is projected to operate at an overall LOS “C” as a signalized intersection during both morning and afternoon peak hours through 2040.
- 2. E. Alameda Avenue/Trussville Road:** This roundabout controlled intersection is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040.
- 3. E. Alameda Avenue/Waterloo Street:** All movements at this stop-sign controlled, right-in/right-out intersection are expected to operate at LOS “B” or better during both morning and afternoon peak-hours through 2040.
- 4. Monaghan Road/E. Alameda Avenue:** This future signalized intersection is expected to operate at an overall LOS “B” during both morning and afternoon peak-hours through 2040.
- 5. Intentionally Left Blank**
- 6. Powhaton Road/PA-6 Access:** By 2040 it was assumed that Powhaton Road would be constructed to its final six-lane cross-section and a west leg would be constructed to serve future development west of Powhaton Road. Based on the projected 2040 total traffic volumes the eastbound and westbound left-turn and through movements are projected to operate at LOS “E” or “F” during the morning peak-hour and LOS “F” during the afternoon peak-hour if this intersection remains stop-sign controlled.
- 7. Intentionally Left Blank**
- 8. Monaghan Road/PA-13 Access:** All movements at this future stop-sign controlled intersection are expected to operate at LOS “B” or better through 2040.

9. **E. Exposition Avenue/Powhatan Road:** By 2040 it was assumed that Powhatan Road would be constructed to its final six-lane cross-section and that the intersection with E. Exposition Avenue would be converted to traffic signal control. Powhatan Road/E. Exposition Avenue is projected to operate at an overall LOS “B” as a signalized intersection during both morning and afternoon peak hours through 2040.
10. **E. Exposition Avenue/Future PA-8 Access:** 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.
11. **E. Exposition Avenue/Future PA-10 Access:** 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.
12. **E. Exposition Avenue/Trussville Road:** This roundabout controlled intersection is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040.
13. **E. Exposition Avenue/Future Access:** 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.
14. **E. Exposition Avenue/Monaghan Road:** This future signalized intersection is expected to operate at an overall LOS “C” during both morning and afternoon peak-hours through 2040.

TRIP GENERATION

Table 1 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, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 1 also shows a comparison of the current trip generation for the entire Harmony Master Plan area to the trip generation estimate assumed in the Master TIS.

Harmony Phase 4 is expected to generate about 7,014 vehicle-trips on the average weekday, with about half entering and half exiting during a 24-hour period. This is about 120 fewer vehicle-trips per day than was assumed for the same area in the Master TIS. During the morning peak-hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 137 vehicles would enter and about 412 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 463 vehicles would enter and about 272 vehicles would exit.

DIRECTIONAL DISTRIBUTION

Figure 6 shows the estimated directional distribution of the site-generated traffic volumes on the area roadways. The estimates were based on the location of the site with respect to the re-

gional population, employment, and activity centers; the site's proposed land use; and the assumptions of the Master TIS.

TRIP ASSIGNMENT

Figure 7 shows the estimated assignment of 2024 site-generated traffic volumes based on the trip generation estimate (from Table 1) and the 2024 directional distribution shown in Figure 6. It assumes no connection northeast or southeast.

Figure 8 shows the estimated assignment of 2040 site-generated traffic volumes based on the trip generation estimate (from Table 1) and the 2040 directional distribution shown in Figure 6.

2024 AND 2040 TOTAL TRAFFIC

Figure 9 shows the estimated 2024 total traffic which is the sum of the 2024 background traffic volumes (from Figure 4) and the 2024 site-generated traffic volumes (from Figure 7). Figure 9 also shows the recommended 2024 lane geometry and traffic control.

Figure 10 shows the estimated 2040 total traffic which is the sum of the 2040 background traffic volumes (from Figure 5) and the 2040 site-generated traffic volumes (from Figure 8). Figure 10 also shows the recommended 2040 lane geometry and traffic control.

PROJECTED LEVELS OF SERVICE

The intersections in Figures 9 and 10 were analyzed to determine the 2024 and 2040 total levels of service. Table 2 shows the level of service analysis results. The level of service reports are attached.

- 1. Powhaton Road/E. Alameda Avenue:** This intersection is projected to operate at LOS "C" or better for all movements through 2024 as a two-stage, stop-sign controlled "T" intersection. By 2040 it was assumed that Powhaton Road would be constructed to its final six-lane cross-section and that the intersection with E. Alameda Avenue would be converted to traffic signal control. E. Alameda Avenue/Powhaton Road is projected to operate at an overall LOS "C" as a signalized intersection during both morning and afternoon peak-hours through 2040.
- 2. E. Alameda Avenue/Trussville Road:** This roundabout controlled intersection is expected to operate at an overall LOS "A" during both morning and afternoon peak-hours through 2040.
- 3. E. Alameda Avenue/Waterloo Street:** All movements at this stop-sign controlled, right-in/right-out intersection are expected to operate at LOS "B" or better during both morning and afternoon peak-hours through 2040.
- 4. Monaghan Road/E. Alameda Avenue:** This future signalized intersection is expected to operate at an overall LOS "C" during both morning and afternoon peak-hours through 2040.

5. **Trussville Road/PA-11 North Access:** All movements at this stop-sign controlled intersection are expected to operate at LOS “A” during both morning and afternoon peak-hours through 2040.
6. **Powhaton Road/PA-6 Access:** This intersection is projected to operate at LOS “B” or better for all movements through 2024 as a two-stage, stop-sign controlled “T” intersection. By 2040 it was assumed that Powhaton Road would be constructed to its final six-lane cross-section and a west leg would be constructed to serve future development west of Powhaton Road. Based on the projected 2040 total traffic volumes the eastbound and westbound left-turn and through movements are projected to operate at LOS “F” during both morning and afternoon peak-hours if this intersection remains stop-sign controlled. If converted to traffic signal control or a modern roundabout this intersection is projected to operate at an overall LOS “B” or better through 2040. If vehicles from the currently proposed Harmony Phase 4 wish to avoid excessive delay during the peak-hours they would have the option to travel south to the planned intersection with E. Exposition Avenue or north through the future parcel located southeast of the intersection of N. Powhaton Road/E. Alameda Avenue that is not a part of the Harmony development to an intersection with E. Alameda Avenue. LSC recommends the traffic control at this intersection be reevaluated when plans are submitted for the development of the 20-acre commercial parcel located on the northeast corner that is not part of the Harmony development and/or when plans are submitted for the development of the property on the west side of Powhaton Road.
7. **Trussville Road/PA-11 South Access:** 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.
8. **Monaghan Road/PA-13 Access/PA-12 Access:** All movements at this future stop-sign controlled intersection are expected to operate at LOS “C” or better through 2040.
9. **Powhaton Road/E. Exposition Avenue:** This intersection is projected to operate at LOS “C” or better for all movements through 2024 as a two-stage, stop-sign controlled “T” intersection. By 2040 it was assumed that Powhaton Road would be constructed to its final six-lane cross-section and that the intersection with E. Exposition Avenue would be converted to traffic signal control. Powhaton Road/E. Exposition Avenue is projected to operate at an overall LOS “B” as a signalized intersection during both morning and afternoon peak-hours through 2040.
10. **E. Exposition Avenue/PA-5 Access/Future PA-8 Access:** 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.
11. **E. Exposition Avenue/PA-7 Access/Future PA-10 Access:** 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.

- 12. E. Exposition Avenue/Trussville Road:** This roundabout controlled intersection is expected to operate at an overall LOS “A” during both morning and afternoon peak-hours through 2040.
- 13. E. Exposition Avenue/PA-12 Access/Future Access:** 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.
- 14. E. Exposition Avenue/Monaghan Road:** This future signalized intersection is expected to operate at an overall LOS “C” during both morning and afternoon peak-hours through 2040.

95TH PERCENTILE QUEUE LENGTHS AND RECOMMENDED TURN LANES

The estimated 95th percentile queue lengths for the intersections in the study area are shown in Table 3 along with the recommended turn lane lengths.

TRAFFIC SIGNAL WARRANT ANALYSIS

Tables 4a through 4e 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) at the intersections of Powhatan Road/E. Alameda Avenue (#1), Monaghan Road/E. Alameda Avenue (#4), Powhatan Road/PA-6 Access (#6), Powhatan Road/E. Exposition Avenue (#9), and Monaghan Avenue/E. Exposition Avenue (#14). The findings of Tables 4a through 4e are summarized in Table 5. All of these intersections are expected to meet traffic signal warrants between 2024 and 2040.

PEDESTRIAN ACCOMMODATION

An east-west crosswalk with a pedestrian-activated Rectangular Rapid Flashing Beacon (RRFB) is proposed at Intersection #7 to assist pedestrians with crossing Trussville Road.

DEFERRAL OF SOUTH HALF OF E. ALAMEDA AVENUE CONSTRUCTION

The applicant is proposing to defer the ultimate widening of E. Alameda Avenue to occur once a four-lane section is required due to traffic volumes. The applicant would be willing to escrow funds with the City so construction could occur rather quickly once deemed to be necessary.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

1. Harmony Phase 4 is expected to generate about 7,014 vehicle-trips on the average week-day, with about half entering and half exiting during a 24-hour period. During the morning peak-hour about 137 vehicles would enter and about 412 vehicles would exit the site. During the afternoon peak-hour about 463 vehicles would enter and about 272 vehicles would exit.

Projected Levels of Service

2. All of the signalized and roundabout controlled intersections in the study area are expected to operate at LOS “C” or better during both morning and afternoon peak-hours through 2040 with the recommended improvements.
3. All movements at the unsignalized intersections in the study area except for Intersection #6 are expected to operate at LOS “D” or better during both morning and afternoon peak-hours through 2040.
4. The intersection of Powhaton Road and the shared access for Harmony Phase 4 and the future 20-acre commercial parcel (Intersection #6) is projected to operate at LOS “C” or better for all movements through 2024 as a two-stage, stop-sign controlled “T” intersection. LSC recommends the traffic control at this intersection be reevaluated when the adjacent commercial parcel that is not part of the Harmony development or the parcels east of Powhaton Road develop.

Conclusions

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

Recommendations

6. The recommended improvements for 2024 are shown in Figure 9.
7. The recommended improvements for 2040 are shown in Figure 10.
8. The recommended turn lane lengths and tapers are shown in Table 3.
9. The timing of traffic signal warrants at the key area intersections is shown in Table 5.
10. The applicant should coordinate with the City on the details of entering into a deferral agreement for the ultimate buildout of E. Alameda Avenue adjacent to the site.

* * * * *

We trust our findings will assist you in gaining approval of the proposed Harmony Phase 4 development. Please contact me if you have any questions or need further assistance.

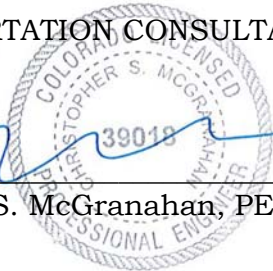
Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By



Christopher S. McGranahan, PE, PTOE
Principal



CSM/wc

7-16-21

Enclosures: Tables 1 - 5
Figures 1 - 10
Appendix Table 1
Appendix Figures 1 - 6
Figures 6 and 12 from *Sky Ranch GDP - Neighborhoods A and B TIS* by LSC
Figures 3a, 6, 7, and 8a from *Harmony CSP 3 TIS* by LSC
Traffic Counts
Level of Service Definitions
Level of Service and Queuing Reports

Table 1
ESTIMATED TRAFFIC GENERATION
Harmony Phase 4
Aurora, CO
LSC #200710; July, 2021

Trip Generation Estimate from <i>Harmony Traffic Impact Analysis</i> March 9, 2017												Trip Generation Estimate Based on Existing, Approved, Currently Proposed and Currently Anticipated Future Land Uses										Change in Trip Generation Estimate						
Trip Generating Category	Quantity	Trip Generation Rates ⁽¹⁾					Primary Trips					Quantity	Trip Generation Rates ⁽²⁾					Primary Trips					Quantity	Primary Trips				
		Average Weekday	AM Peak Hour		PM Peak Hour		Average Weekday	AM Peak Hour		PM Peak - Hour			Average Weekday	AM Peak Hour		PM Peak - Hour		Average Weekday	AM Peak Hour		PM Peak - Hour							
			In	Out	In	Out		In	Out	In	Out			In	Out	In	Out		In	Out	In	Out						
Planning Area 1																												
Single-Family Detached Housing ⁽³⁾	45 DU ⁽⁴⁾	9.52	0.188	0.563	0.630	0.370	428	8	25	28	17 *	42 DU	9.44	0.19	0.56	0.62	0.37	396	8	23	26	15	-3 DU	-32	-1	-2	-2	-1
Planning Area 2																												
Single-Family Detached Housing	393 DU	9.52	0.188	0.563	0.630	0.370	3,741	74	222	248	145 *	448 DU	9.44	0.19	0.56	0.62	0.37	4,229	83	249	279	164	55 DU	488	9	27	32	19
Planning Area 3																												
Single-Family Detached Housing	595 DU	9.52	0.188	0.563	0.630	0.370	5,664	113	335	375	220 *	605 DU	9.44	0.19	0.56	0.62	0.37	5,711	112	336	377	222	10 DU	47	-1	1	2	1
Townhouses ⁽⁵⁾	0 DU	5.81	0.075	0.365	0.348	0.172	0	0	0	0	0 *	97 DU	7.32	0.11	0.35	0.35	0.21	710	10	34	34	20	97 DU	710	10	34	34	20
Planning Area 4																												
Single-Family Detached Housing	0 DU	9.52	0.188	0.563	0.630	0.370	0	1	0	0	0 *	56 DU	9.44	0.19	0.56	0.62	0.37	529	10	31	35	21	56 DU	529	9	31	35	21
Townhouses	120 DU	5.81	0.075	0.365	0.348	0.172	697	9	44	42	21 *	0 DU	7.32	0.11	0.35	0.35	0.21	0	0	0	0	0	-120 DU	-697	-9	-44	-42	-21
Planning Area 5																												
Single-Family Detached Housing	70 DU	9.52	0.188	0.563	0.630	0.370	666	13	39	44	26	104 DU	9.44	0.19	0.56	0.62	0.37	982	19	58	65	38	34 DU	315	6	18	21	12
Planning Area 6																												
Townhouses	115 DU	5.81	0.075	0.365	0.348	0.172	668	9	42	40	20	0 DU	7.32	0.11	0.35	0.35	0.21	0	0	0	0	0	-115 DU	-668	-9	-42	-40	-20
Single-Family Detached Housing	0 DU	9.52	0.188	0.563	0.630	0.370	0	0	0	0	0	96 DU	9.44	0.19	0.56	0.62	0.37	906	18	53	60	35	96 DU	906	18	53	60	35
Planning Area 7																												
Single-Family Detached Housing	130 DU	9.52	0.188	0.563	0.630	0.370	1,238	24	73	82	48	193 DU	9.44	0.19	0.56	0.62	0.37	1,822	36	107	120	71	63 DU	584	11	34	38	23
Planning Area 8																												
Single-Family Detached Housing	42 DU	9.52	0.188	0.563	0.630	0.370	400	8	24	27	16	109 DU	9.44	0.19	0.56	0.62	0.37	1,029	20	60	68	40	67 DU	629	12	37	41	24
Planning Area 9																												
Single-Family Detached Housing	50 DU	9.52	0.188	0.563	0.630	0.370	476	9	28	32	19	64 DU	9.44	0.19	0.56	0.62	0.37	604	12	36	40	23	14 DU	128	2	7	8	5
Planning Area 10																												
Single-Family Detached Housing	260 DU	9.52	0.188	0.563	0.630	0.370	2,475	49	146	164	96	231 DU	9.44	0.19	0.56	0.62	0.37	2,181	43	128	144	85	-29 DU	-295	-6	-18	-20	-12
Planning Area 11																												
Single-Family Detached Housing	66 DU	9.52	0.188	0.563	0.630	0.370	628	12	37	42	24	81 DU	9.44	0.19	0.56	0.62	0.37	765	15	45	51	30	15 DU	136	3	8	9	5
Planning Area 12																												
Single-Family Detached Housing	314 DU	9.52	0.188	0.563	0.630	0.370	2,989	59	177	198	116	269 DU	9.44	0.19	0.56	0.62	0.37	2,539	50	149	168	99	-45 DU	-450	-9	-27	-30	-18
Planning Area 13																												
Single-Family Detached Housing	195 DU	9.52	0.188	0.563	0.630	0.370	1,856	37	110	123	72	206 DU	9.44	0.19	0.56	0.62	0.37	1,945	38	114	128	75	11 DU	88	2	5	6	3
Planning Area 14																												
Single-Family Detached Housing	195 DU	9.52	0.188	0.563	0.630	0.370	1,856	37	110	123	72	197 DU	9.44	0.19	0.56	0.62	0.37	1,860	36	109	123	72	2 DU	3	-0	-0	-0	-0
Planning Area 15																												
Single-Family Detached Housing	345 DU	9.52	0.188	0.563	0.630	0.370	3,284	65	194	217	128	357 DU	9.44	0.19	0.56	0.62	0.37	3,370	66	198	223	131	12 DU	86	1	4	5	3
Planning Area 16																												
Townhouses	75 DU	5.81	0.075	0.365	0.348	0.172	436	6	27	26	13	0 DU	7.32	0.11	0.35	0.35	0.21	0	0	0	0	0	-75 DU	-436	-6	-27	-26	-13
Planning Area 17																												
Elementary School ⁽⁶⁾	516 Students	1.29	0.248	0.203	0.074	0.077	666	128	104	38	39	772 Students	1.89	0.3618	0.3082	0.0816	0.0884	1,459	279	238	63	68	256 Students	793	152	133	25	29
Middle School/Junior High ⁽⁷⁾	172 Students	1.62	0.297	0.243	0.078	0.082	279	51	42	13	14	211 Students	2.13	0.3132	0.2668	0.0833	0.0867	449	66	56	18	18	39 Students	171	15	14	4	4
Planning Area 18																												
Elementary School	516 Students	1.29	0.248	0.203	0.074	0.077	666	128	104	38	39	772 Students	1.89	0.3618	0.3082	0.0816	0.0884	1,459	279	238	63	68	256 Students	793	152	133	25	29
Middle School/Junior High	172 Students	1.62	0.297	0.243	0.078	0.082	279	51	42	13	14	211 Students	2.13	0.3132	0.2668	0.0833	0.0867	449	66	56	18	18	39 Students	171	15	14	4	4
Planning Area 19																												
Community Center ⁽⁸⁾	11.5 KSF ⁽⁹⁾	33.82	1.353	0.697	1.343	1.397	389	16	8	15	16 *	11.5 KSF	28.82	1.1616	0.5984	1.0857	1.2243	331	13	7	12	14	0 KSF	-58	-2	-1	-3	-2
Planning Area 64																												
Fire Station ⁽¹⁰⁾	1																											

Table 2 (Page 1 of 3)
Intersection Levels of Service Analysis
Harmony Phase 4
Aurora, Colorado
LSC #200710; July, 2021

Intersection No. & Location	Traffic Control	2024 Background Traffic		2024 Total Traffic		2040 Background Traffic		2040 Total Traffic	
		Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM
1) <u>Powhaton Road NB/Alameda Avenue</u>	TWSC								
EB Through		B	B	B	C	--	--	--	--
WB Through		B	B	B	B	--	--	--	--
WB Right		A	A	B	A	--	--	--	--
Critical Movement Delay(sec /veh)		11.6	12.6	14.1	19.7	--	--	--	--
101) <u>Powhaton Road SB/Alameda Avenue</u>	TWSC								
WB Left		B	B	B	C	--	--	--	--
Critical Movement Delay(sec /veh)		11.8	11.7	13.7	20.4	--	--	--	--
1) <u>Powhaton Road/Alameda Avenue</u>	Signalized								
EB Left		--	--	--	--	D	D	D	D
EB Through		--	--	--	--	D	D	D	D
EB Right		--	--	--	--	A	B	A	B
WB Left		--	--	--	--	C	D	C	D
WB Through		--	--	--	--	D	D	D	D
WB Right		--	--	--	--	B	A	B	B
NB Left		--	--	--	--	B	B	B	B
NB Through		--	--	--	--	C	C	C	B
NB Right		--	--	--	--	A	A	A	A
SB Left		--	--	--	--	B	B	B	B
SB Through		--	--	--	--	B	B	B	B
SB Right		--	--	--	--	A	A	A	A
Entire Intersection Delay (sec /veh)		--	--	--	--	23.8	22.4	24.8	23.7
Entire Intersection LOS		--	--	--	--	C	C	C	C
2) <u>E. Alameda Avenue/Trussville Road</u>	Roundabout								
EB Left/Through		A	A	A	A	A	A	A	A
EB Through/Right		A	A	A	A	A	A	A	A
WB Left/Through		A	A	A	A	A	A	A	A
WB Through/Right		A	A	A	A	A	A	A	A
NB Approach		A	A	A	A	A	A	A	A
SB Approach		A	A	A	A	A	A	A	A
Entire Intersection Delay (sec /veh)		3.7	4.0	3.9	3.9	5.1	5.4	5.6	6.2
Entire Intersection LOS		A	A	A	A	A	A	A	A
3) <u>Alameda Avenue/Waterloo Street</u>	TWSC								
NB Right	Right-In/	--	--	A	A	--	--	A	B
SB Right	Right-Out	--	--	A	A	B	A	B	A
Critical Movement Delay(sec /veh)		--	--	8.5	8.4	10.0	9.7	10.1	10.2
4) <u>Monaghan Road/Alameda Avenue</u>	Signalized								
EB Left		--	--	--	--	C	D	D	D
EB Through		--	--	--	--	D	D	D	D
EB Right		--	--	--	--	A	A	A	B
WB Left		--	--	--	--	D	C	D	D
WB Through		--	--	--	--	D	D	D	D
WB Right		--	--	--	--	B	B	C	B
NB Left		--	--	--	--	A	A	A	A
NB Through		--	--	--	--	B	B	B	B
NB Right		--	--	--	--	A	A	A	A
SB Left		--	--	--	--	B	B	B	B
SB Through		--	--	--	--	B	B	B	B
SB Right		--	--	--	--	A	A	A	A
Entire Intersection Delay (sec /veh)		--	--	--	--	19.2	19.2	21.3	20.2
Entire Intersection LOS		--	--	--	--	B	B	C	C

Table 2 (Page 2 of 3)
Intersection Levels of Service Analysis
Harmony Phase 4
Aurora, Colorado
LSC #200710; July, 2021

Intersection No. & Location	Traffic Control	2024 Background Traffic		2024 Total Traffic		2040 Background Traffic		2040 Total Traffic	
		Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM
5) <u>Trussville Road/PA-11 North Access</u>	TWSC								
WB Approach		--	--	A	A	--	--	A	A
SB Left/Through		--	--	A	A	--	--	A	A
Critical Movement Delay(sec /veh)		--	--	8.9	8.8	--	--	9.6	9.2
6) <u>Powhaton Road NB/PA-6 Access</u>	TWSC								
NB Left		--	--	--	--	A	C	B	C
EB Left		--	--	--	--	F	F	F	F
EB Through		--	--	B	B	F	F	F	F
EB Right		--	--	--	--	B	C	B	C
WB Left		--	--	B	B	F	F	F	F
WB Through		--	--	--	--	F	F	F	F
WB Right		--	--	A	B	C	C	C	C
SB Left		--	--	--	--	C	C	D	C
Critical Movement Delay(sec /veh)		--	--	11.3	14.2	>240	>240	>240	>240
106) <u>Powhaton Road SB/PA-6 Access</u>	TWSC								
WB Left		--	--	B	B	--	--	--	--
Critical Movement Delay(sec /veh)		--	--	11.9	13.1	--	--	--	--
6) <u>Powhaton Road/PA-6 Access</u>	Signalized								
EB Left		--	--	--	--	--	--	D	D
EB Through		--	--	--	--	--	--	D	D
EB Right		--	--	--	--	--	--	A	B
WB Left		--	--	--	--	--	--	C	D
WB Through		--	--	--	--	--	--	D	D
WB Right		--	--	--	--	--	--	B	B
NB Left		--	--	--	--	--	--	A	B
NB Through		--	--	--	--	--	--	B	B
NB Right		--	--	--	--	--	--	A	A
SB Left		--	--	--	--	--	--	A	B
SB Through		--	--	--	--	--	--	B	B
SB Right		--	--	--	--	--	--	A	A
Entire Intersection Delay (sec /veh)		--	--	--	--	--	--	12.7	18.2
Entire Intersection LOS		--	--	--	--	--	--	B	B
7) <u>Trussville Road/PA-7 Access/PA-11 South Access</u>	TWSC								
EB Approach		--	--	A	A	--	--	B	B
WB Approach		--	--	A	A	--	--	A	A
NB Approach		--	--	A	A	--	--	A	A
SB Approach		--	--	A	A	--	--	A	A
Critical Movement Delay(sec /veh)		--	--	9.2	9.4	--	--	10.7	10.5
8) <u>Monaghan Road/PA-13 Access/PA-12 Access</u>	TWSC								
NB Left		--	--	A	A	--	--	A	A
EB Left		--	--	A	A	--	--	C	C
EB Through/Right		--	--	--	--	--	--	A	B
WB Approach		--	--	--	--	B	B	--	--
WB Left		--	--	--	--	--	--	C	B
WB Right		--	--	--	--	--	--	B	B
SB Left		--	--	--	--	B	B	B	B
Critical Movement Delay(sec /veh)		--	--	9.0	8.9	14.9	13.5	18.2	20.9
9) <u>Powhaton Road NB/Expositon Avenue</u>	TWSC								
EB Through		--	--	B	C	--	--	--	--
WB Through		--	--	B	B	--	--	--	--
WB Right		--	--	A	B	--	--	--	--
Critical Movement Delay(sec /veh)		--	--	11.9	15.1	--	--	--	--

Table 2 (Page 3 of 3)
Intersection Levels of Service Analysis
Harmony Phase 4
Aurora, Colorado
LSC #200710; July, 2021

Intersection No. & Location	Traffic Control	2024 Background Traffic		2024 Total Traffic		2040 Background Traffic		2040 Total Traffic	
		Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM	Level of Service AM	Level of Service PM
109) <u>Powhaton Road SB/Expositon Avenue</u>	TWSC	--	--	B	B	--	--	--	--
WB Left		--	--	13.6	13.0	--	--	--	--
Critical Movement Delay(sec /veh)		--	--			--	--	--	--
9) <u>Powhaton Road/Expositon Avenue</u>	Signalized	--	--	--	--	D	D	D	D
EB Left		--	--	--	--	C	D	C	D
EB Through/Right		--	--	--	--	D	D	D	D
WB Left		--	--	--	--	B	B	B	B
WB Through/Right		--	--	--	--	A	A	A	A
NB Left		--	--	--	--	B	B	B	B
NB Through		--	--	--	--	A	A	A	A
NB Right		--	--	--	--	A	A	A	A
SB Left		--	--	--	--	A	A	A	A
SB Through/Right		--	--	--	--	A	A	A	A
Entire Intersection Delay (sec /veh)		--	--	--	--	13.6	11.7	17.1	12.9
Entire Intersection LOS		--	--	--	--	B	B	B	B
10) <u>Exposition Avenue/PA-5 Access/Future PA-8 Access</u>	TWSC	--	--	--	--	--	--	C	C
NB Approach		--	--	A	A	B	C	A	A
EB Left		--	--	--	--	--	--	A	A
WB Left		--	--	A	A	A	A	C	C
SB Approach		--	--	9.4	9.1	13.2	15.9	17.0	24.1
Critical Movement Delay(sec /veh)		--	--						
11) <u>E. Exposition Avenue/PA-7 Access/Future PA-10 Access</u>	TWSC	--	--	--	--	--	--	C	C
NB Approach		--	--	A	A	B	C	A	A
EB Left		--	--	--	--	--	--	A	A
WB Left		--	--	A	A	A	A	C	B
SB Approach		--	--	9.1	8.8	13.7	15.6	17.7	22.7
Critical Movement Delay(sec /veh)		--	--						
12) <u>E. Exposition Avenue/Trussville Road</u>	Roundabout	--	--	A	A	A	A	A	A
EB Approach		--	--	A	A	A	A	A	A
WB Approach		--	--	--	--	A	A	A	A
NB Approach		--	--	A	A	A	A	A	A
SB Approach		--	--	3.2	3.2	6.4	6.3	7.2	7.2
Entire Intersection Delay (sec /veh)		--	--	A	A	A	A	A	A
Entire Intersection LOS		--	--						
13) <u>E. Exposition Avenue/Future Access</u>	TWSC	--	--	--	--	--	--	C	C
NB Approach		--	--	A	A	B	C	A	A
EB Left		--	--	--	--	--	--	A	A
WB Left		--	--	A	A	A	A	B	C
SB Approach		--	--	8.7	8.5	13.9	16.2	17.8	22.6
Critical Movement Delay(sec /veh)		--	--						
14) <u>Monaghan Road/E. Exposition Avenue</u>	Signalized	--	--	--	--	C	C	C	C
EB Left		--	--	--	--	D	D	D	D
EB Through		--	--	--	--	A	A	A	A
EB Right		--	--	--	--	C	C	C	C
WB Left		--	--	--	--	D	D	D	D
WB Through		--	--	--	--	A	A	A	A
WB Right		--	--	--	--	B	B	B	B
NB Left		--	--	--	--	B	C	C	C
NB Through/Right		--	--	--	--	B	B	B	B
SB Left		--	--	--	--	B	C	B	C
SB Through/Right		--	--	--	--	23.3	26.2	24.6	27.0
Entire Intersection Delay (sec /veh)		--	--	--	--	C	C	C	C
Entire Intersection LOS		--	--	--	--				

Table 3 (Page 1 of 2)
Queue Lengths and Recommendations
Harmony Phase 4
Aurora, Colorado
LSC #200710; July, 2021

Intersection No. & Location	Traffic Control	2040 Total Traffic 95% Percentile Queue Lengths		Turn Lane Length (feet) ^{(1) (2)}	Recommended Transition Taper (feet) ⁽³⁾
		AM Peak (feet)	PM Peak (feet)		
1) <u>Powhaton Road/Alameda Avenue</u>	Signalized				
EB Left		214	147	225 + 216	145 ⁽⁴⁾
EB Through		116	209	---	
EB Right		13	56	225	145 ⁽⁴⁾
WB Left		114	113	225 + 114	145 ⁽⁴⁾
WB Through		168	157	---	
WB Right		100	52	225	145 ⁽⁴⁾
NB Left		77	53	273 + 131	162 ⁽⁵⁾
NB Through		300	195	---	
NB Right		15	40	273	162 ⁽⁵⁾
SB Left		76	126	273 + 249	162 ⁽⁵⁾
SB Through		164	275	---	
SB Right		43	44	273	162 ⁽⁵⁾
3) <u>Alameda Avenue/Waterloo Street</u>	TWSC				
NB Right		<25	<25	---	
SB Right		<25	<25	---	
EB Right			---	225	145 ⁽⁴⁾
WB Right			---	225	145 ⁽⁴⁾
4) <u>Monaghan Road/E. Alameda Avenue</u>	Signalized				
EB Left		128	165	225 + 109	145 ⁽⁴⁾
EB Through		91	123	---	
EB Right		0	47	225	145 ⁽⁴⁾
WB Left		124	112	225 + 145	145 ⁽⁴⁾
WB Through		123	111	---	
WB Right		143	60	225	145 ⁽⁴⁾
NB Left		45	36	273 + 85	162 ⁽⁵⁾
NB Through		171	119	---	
NB Right		20	39	273	162 ⁽⁵⁾
SB Left		84	133	273 + 285	162 ⁽⁵⁾
SB Through		106	180	---	
SB Right		24	38	273	162 ⁽⁵⁾
6) <u>Powhaton Road/PA-6 Access</u>	Signalized				
EB Left		82	240	190 + 250	120 ⁽⁶⁾
EB Through		14	25	---	
EB Right		1	60	190	120 ⁽⁶⁾
WB Left		41	136	190 + 139	120 ⁽⁶⁾
WB Through		15	25	---	
WB Right		55	86	190	120 ⁽⁶⁾
NB Left		27	71	273 + 125	162 ⁽⁵⁾
NB Through		238	116	---	
NB Right		0	33	273	162 ⁽⁵⁾
SB Left		54	190	273 + 337	162 ⁽⁵⁾
SB Through		73	192	---	
SB Right		24	45	273	162 ⁽⁵⁾

Notes:

- (1) Length based on the greater of the queue length or 150 feet for local/collector streets and the *State Highway Access Code* deceleration lengths. Left-turn movements include both a deceleration and vehicle storage requirement.
- (2) Queue lengths for signalized intersections are shown in the attached queuing reports. Queue lengths for unsignalized intersections are from the attached level of service reports.
- (3) An appropriate transition taper 10:1 for 35 mph, 12:1 for 40 mph, and 13.5:1 for 45 mph
- (4) Based on a posted speed limit of 40 mph
- (5) Based on a posted speed limit of 45 mph
- (6) Based on a posted speed limit of 35 mph

Table 3 (Page 2 of 2)
Queue Lengths and Recommendations
Harmony Phase 4
Aurora, Colorado
LSC #200710; July, 2021

Intersection No. & Location	Traffic Control	2040 Total Traffic 95% Percentile Queue Lengths		Recommended Turn Lane Length (feet) ⁽¹⁾ ⁽²⁾	Recommended Transition Taper (feet) ⁽³⁾
		AM Peak (feet)	PM Peak (feet)		
9) <u>Powhatan Road/E. Exposition Avenue</u>	Signalized				
EB Left		37	48	190 + 35	120 ⁽⁶⁾
EB Through/Right		20	20	---	
WB Left		260	179	190 + 225	120 ⁽⁶⁾
WB Through/Right		133	79	---	
NB Left		6	9	273 + 30	162 ⁽⁵⁾
NB Through		207	108	---	
NB Right		24	45	273	162 ⁽⁵⁾
SB Left		91	151	273 + 335	162 ⁽⁵⁾
SB Through/Right		108	144	---	
10) <u>Exposition Avenue/PA-5 Access/Future PA-8 Access</u>					
NB	TWSC	<25	<25	---	
EB Left		<25	<25	190 + 32	120 ⁽⁶⁾
WB Left		<25	<25	190 + 30	120 ⁽⁶⁾
SB		<25	<25	---	
11) <u>E. Exposition Avenue/PA-7 Access/Future PA-10 Access</u>					
NB	TWSC	<25	<25	---	
EB Left		<25	<25	190 + 30	120 ⁽⁶⁾
WB Left		<25	<25	190 + 31	120 ⁽⁶⁾
SB		<25	<25	---	
13) <u>E. Exposition Avenue/PA-12 Access/Future Access</u>					
NB	TWSC	<25	<25	---	
EB Left		<25	<25	190 + 31	120 ⁽⁶⁾
WB Left		<25	<25	190 + 49	120 ⁽⁶⁾
SB		<25	<25	---	
14) <u>Monaghan Road/E. Exposition Avenue</u>	Signalized				
EB Left		126	83	190 + 154	120 ⁽⁶⁾
EB Through		192	350	---	
EB Right		0	0	190	120 ⁽⁶⁾
WB Left		68	70	225 + 76	120 ⁽⁶⁾
WB Through		285	255	---	
WB Right		46	20	190	120 ⁽⁶⁾
NB Left		28	45	273 + 55	162 ⁽⁵⁾
NB Through/Right		172	187	---	
SB Left		38	98	273 + 137	162 ⁽⁵⁾
SB Through/Right		175	246	---	

Notes:

- (1) Length based on the greater of the queue length or 150 feet for local/collector streets and the *State Highway Access Code* deceleration lengths. Left-turn movements include both a deceleration and vehicle storage requirement.
- (2) Queue lengths for signalized intersections are shown in the attached queuing reports. Queue lengths for unsignalized intersections are from the attached level of service reports.
- (3) An appropriate transition taper 10:1 for 35 mph, 12:1 for 40 mph, and 13.5:1 for 45 mph

<p align="center">Table 4a Powhaton Road/E. Alameda Avenue (#1) Harmony Phase 4 Aurora, CO LSC #200710; July, 2021</p>																		
Warrant Analysis ⁽¹⁾																		
Warrant 1: Eight Hour Vehicular Volume Evaluation													Warrant 2: Four Hour Vehicular Volume Evaluation			Warrant 3: Peak Hour Vehicular Volume Evaluation		
				<u>Warrant Thresholds</u>				<u>Warrant Threshold Met?</u>				56% Combined Condition Warrant Threshold Met?	70% Warrant Threshold Minimum	<u>Warrant Threshold Met?</u>		70% Warrant Threshold Minimum	<u>Warrant Threshold Met?</u>	
				Condition A (70%)		Condition B (70%)		Minor 1 Leg		Minor 2 Leg				Minor 1	Minor 2		Minor 1	Minor 2
Hour	Major ⁽²⁾	Minor 1 ⁽³⁾	Minor 2 ⁽³⁾	Major	Minor	Major	Minor	A	B	A	B			Leg	Leg		Leg	Leg
2024 Total Traffic																		
AM Peak	646	0	216	420	140	630	70	No	No	Yes	Yes	Yes	175	No	Yes	315	No	No
PM Peak	1002	0	133	420	140	630	70	No	No	No	Yes	Yes	80	No	Yes	145	No	No
2040 Total Traffic																		
AM Peak	2393	435	473	420	140	630	70	Yes	Yes	Yes	Yes	Yes	80	Yes	Yes	100	Yes	Yes
PM Peak	2771	424	562	420	140	630	70	Yes	Yes	Yes	Yes	Yes	80	Yes	Yes	100	Yes	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

Source: LSC Transportation Consultants, Inc.

<p align="center">Table 4b Monaghan Road/E. Alameda Avenue (#4) Harmony Phase 4 Aurora, CO LSC #200710; July, 2021</p>																		
Warrant Analysis ⁽¹⁾																		
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?				56% Combined Condition Warrant Threshold Met?	70% Warrant Threshold Minor Minimum	Warrant Threshold Met?		70% Warrant Threshold Minor Minimum	Warrant Threshold Met?			
		Condition A (70%)		Condition B (70%)		Minor 1 Leg		Minor 2 Leg				Minor 1	Minor 2		Minor 1	Minor 2		
Hour	Major ⁽²⁾	Minor 1 ⁽³⁾	Minor 2 ⁽³⁾	Major	Minor	Major	Minor	A	B			A	B		Leg	Leg	Leg	Leg
2040 Total Traffic																		
AM Peak	1886	356	487	420	140	630	70	Yes	Yes	Yes	Yes	Yes	80	Yes	Yes	100	Yes	Yes
PM Peak	2226	409	473	420	140	630	70	Yes	Yes	Yes	Yes	Yes	80	Yes	Yes	100	Yes	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

Source: LSC Transportation Consultants, Inc.

Warrant Analysis ⁽¹⁾																		
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?				56% Combined Condition Warrant Threshold Met?		70% Warrant Threshold Minimum	Warrant Threshold Met?		70% Warrant Threshold Minimum	Warrant Threshold Met?				
Condition A (70%)		Condition B (70%)		Minor 1 Leg		Minor 2 Leg					Minor 1 Leg	Minor 2 Leg		Minor 1 Leg	Minor 2 Leg			
Hour	Major ⁽²⁾	Minor 1 ⁽³⁾	Minor 2 ⁽³⁾	Major	Minor	Major	Minor	A	B	A	B							
2024 Total Traffic																		
AM Peak	686	0	5	420	140	630	70	No	No	No	No	No	175	No	No	315	No	No
PM Peak	874	0	4	420	140	630	70	No	No	No	No	No	110	No	No	220	No	No
2040 Total Traffic																		
AM Peak	2160	35	80	420	140	630	70	No	No	No	Yes	No	80	No	Yes	100	No	No
PM Peak	2202	149	260	420	140	630	70	Yes	Yes	Yes	Yes	Yes	80	Yes	Yes	100	Yes	Yes

<p align="center">Table 4d Powhatan Road/E. Exposition Avenue (#9) Harmony Phase 4 Aurora, CO LSC #200710; July, 2021</p>																		
Warrant Analysis ⁽¹⁾																		
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?				56% Combined Condition Warrant Threshold Met?		70% Warrant Threshold Minimum	Warrant Threshold Met?		70% Warrant Threshold Minimum	Warrant Threshold Met?				
Condition A (70%)		Condition B (70%)		Minor 1 Leg		Minor 2 Leg					Minor 1 Leg	Minor 2 Leg		Minor 1 Leg	Minor 2 Leg			
Hour	Major ⁽²⁾	Minor 1 ⁽³⁾	Minor 2 ⁽³⁾	Major	Minor	Major	Minor	A	B	A	B							
2024 Total Traffic																		
AM Peak	620	0	146	420	140	630	70	No	No	Yes	No	Yes	175	No	No	315	No	No
PM Peak	833	0	103	420	140	630	70	No	No	No	Yes	No	110	No	No	220	No	No
2040 Total Traffic																		
AM Peak	1747	31	317	420	140	630	70	No	No	Yes	Yes	Yes	80	No	Yes	100	No	Yes
PM Peak	1924	41	234	420	140	630	70	No	No	Yes	Yes	Yes	80	No	Yes	100	No	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

Source: LSC Transportation Consultants, Inc.

<p align="center">Table 4e Monaghan Road/E. Exposition Avenue (#14) Harmony Phase 4 Aurora, CO LSC #200710; July, 2021</p>																		
Warrant Analysis ⁽¹⁾																		
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?				56% Combined Condition Warrant Threshold Met?				70% Warrant Threshold Minimum	Warrant Threshold Met?		70% Warrant Threshold Minimum	Warrant Threshold Met?		
Condition A (70%)		Condition B (70%)		Minor 1 Leg		Minor 2 Leg							Minor 1 Leg	Minor 2 Leg		Minor 1 Leg	Minor 2 Leg	
Hour	Major ⁽²⁾	Minor 1 ⁽³⁾	Minor 2 ⁽³⁾	Major	Minor	Major	Minor	A	B	A	B							
2040 Total Traffic																		
AM Peak	1476	356	389	420	140	630	70	Yes	Yes	Yes	Yes	Yes	80	Yes	Yes	100	Yes	Yes
PM Peak	1777	351	449	420	140	630	70	Yes	Yes	Yes	Yes	Yes	80	Yes	Yes	100	Yes	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

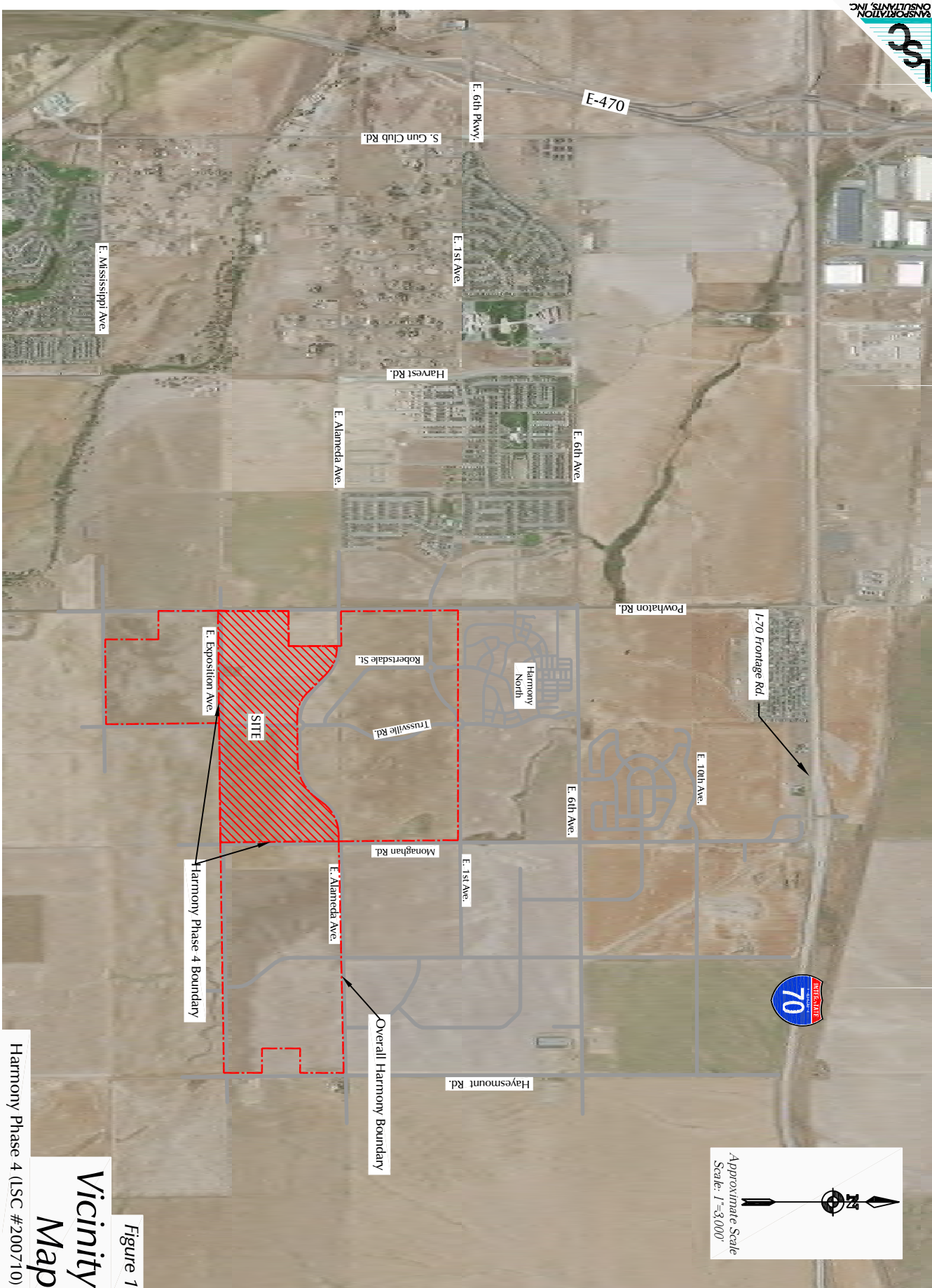
(2) The major street traffic includes all movements (left, through, and right)

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

Source: LSC Transportation Consultants, Inc.

Table 5
Traffic Signal Warrant Analyses Summary
Harmony Phase 4
Aurora, CO
LSC #200710; July, 2021

Intersection Number	Intersection Name	Warrant 1 - Eight-Hour		Warrant 2 - Four-Hour		Warrant 3 - Peak-Hour	
		2024 Total	2040 Total	2024 Total	2040 Total	2024 Total	2040 Total
1	Powhaton Road/E. Alameda Avenue	Yes	Yes	Yes	Yes	No	Yes
4	Monaghan Road/E. Alameda Avenue	--	Yes	--	Yes	--	Yes
6	Powhaton Road/Site Access	No	Yes	No	Yes	No	Yes
9	Powhaton Road/E. Exposition Avenue	No	Yes	No	Yes	No	Yes
14	Monaghan Road/E. Exposition Avenue	--	Yes	--	Yes	--	Yes



Approximate Scale
Scale: 1"=3,000'

Figure 1

Vicinity Map

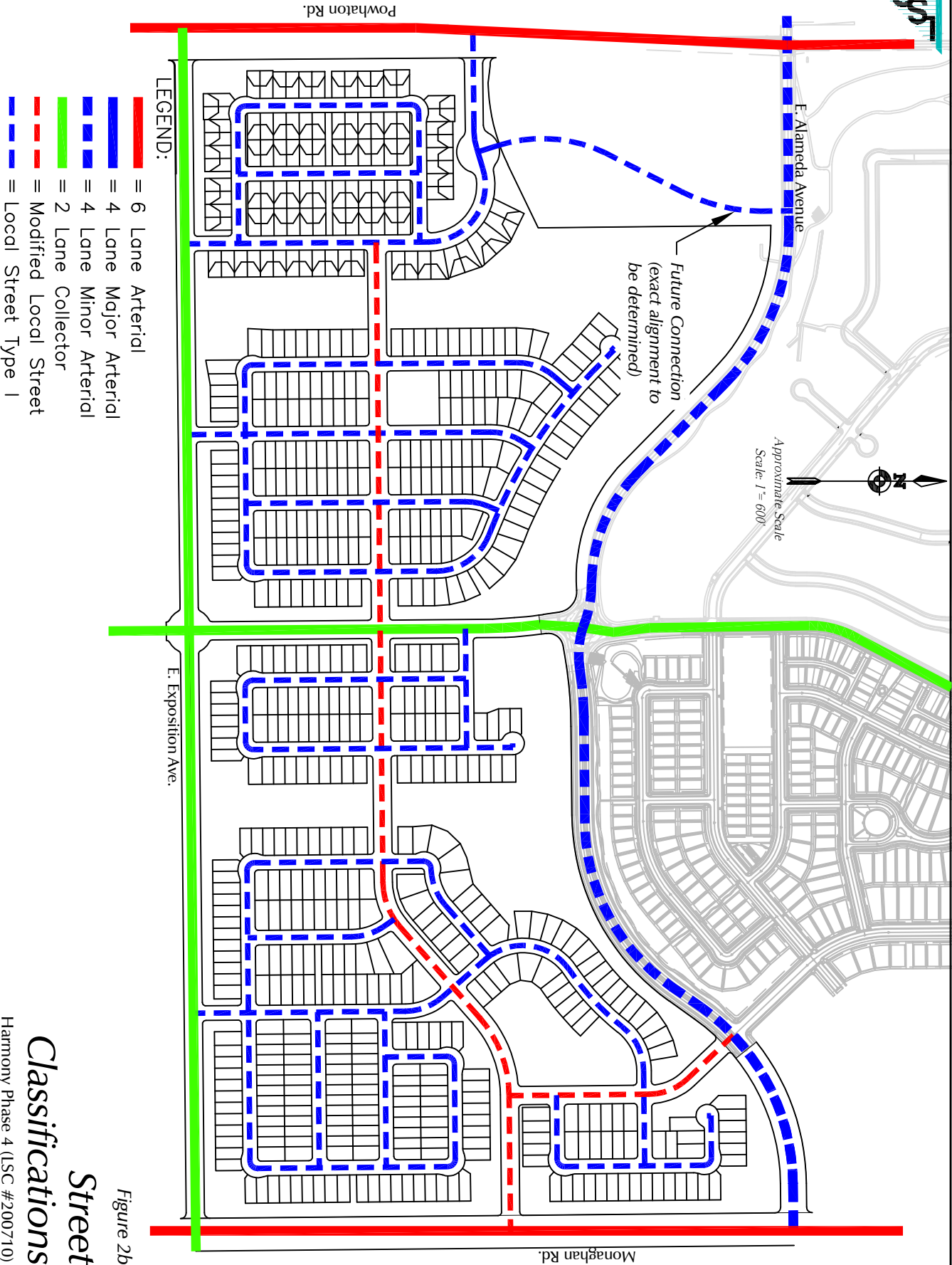
Harmony Phase 4 (LSC #200710)



Figure 2a

Site Plan

Harmony Phase 4 (LSC #200710)



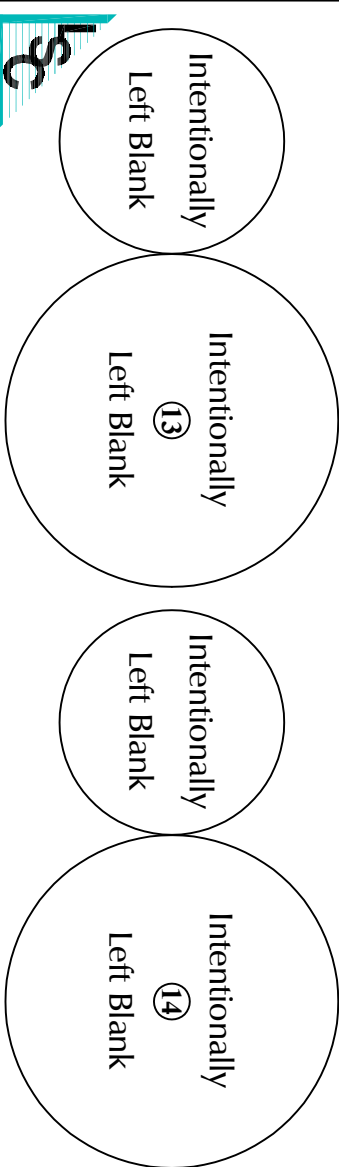
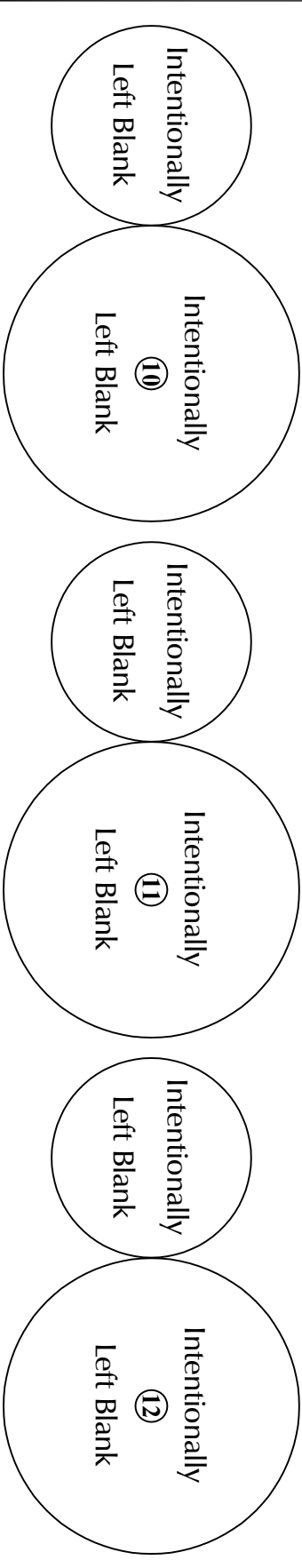
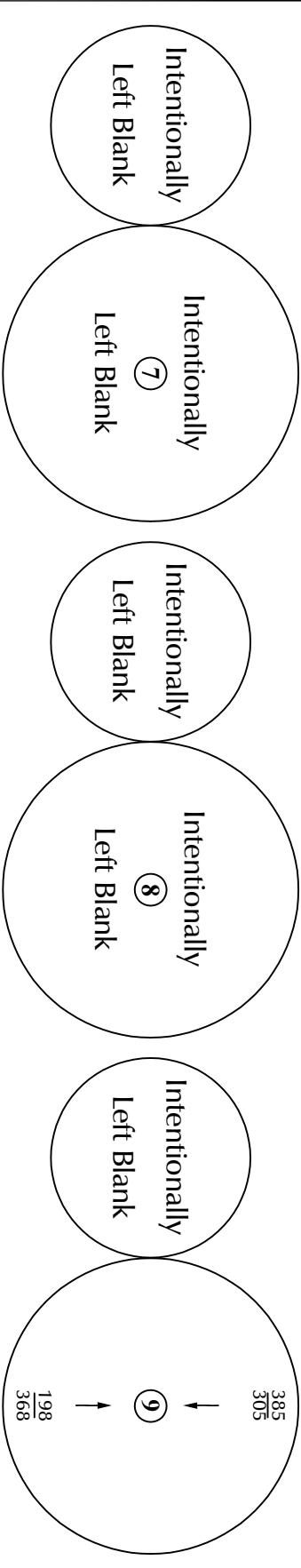
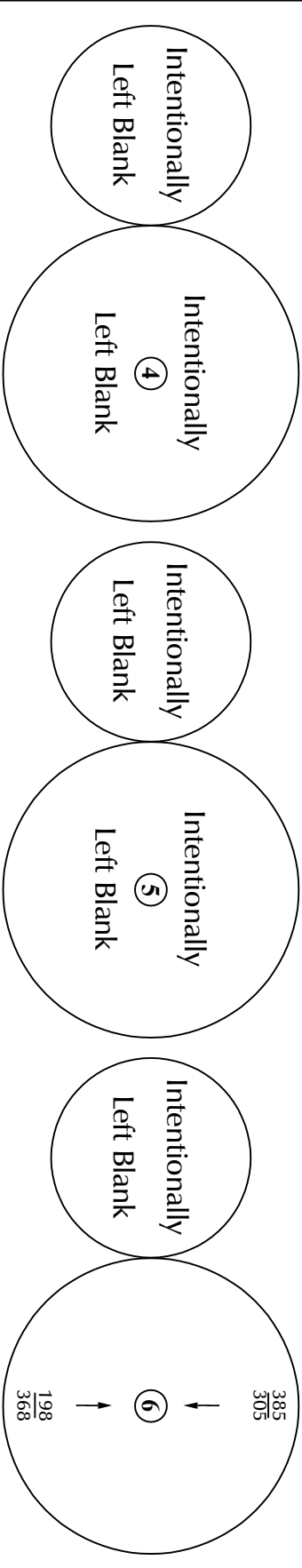
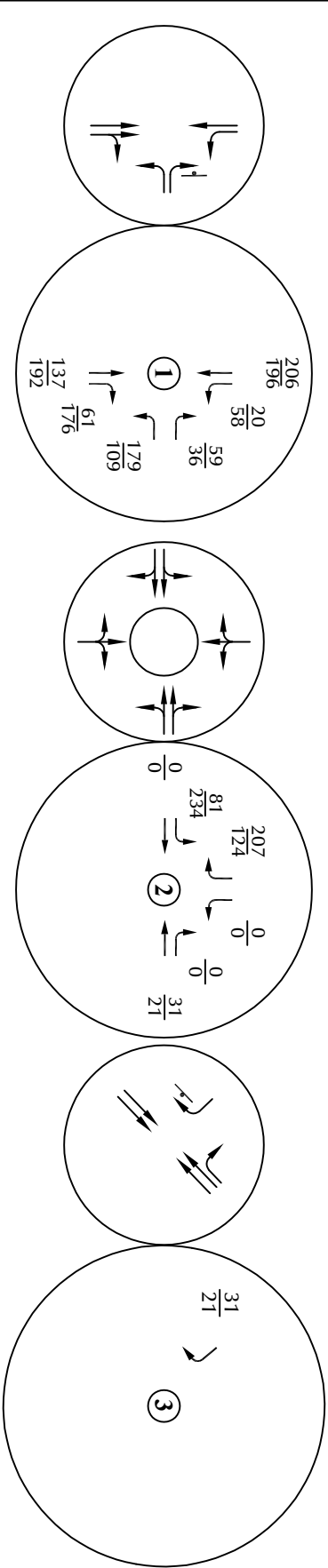


LEGEND:

+	= Stop Sign
$\frac{26}{35}$	= $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
1,000	= Average Daily Traffic

*Existing Traffic, Lane
Geometry and Traffic Control*

Harmony Phase 4 (LSC #200710)



LEGEND:

- ⊥ = Stop Sign
- ⬤ = Traffic Signal
- = Modern Roundabout
- $\frac{26}{35}$ = AM Peak Hour Traffic
- $\frac{26}{35}$ = PM Peak Hour Traffic
- 1,000 = Average Daily Traffic

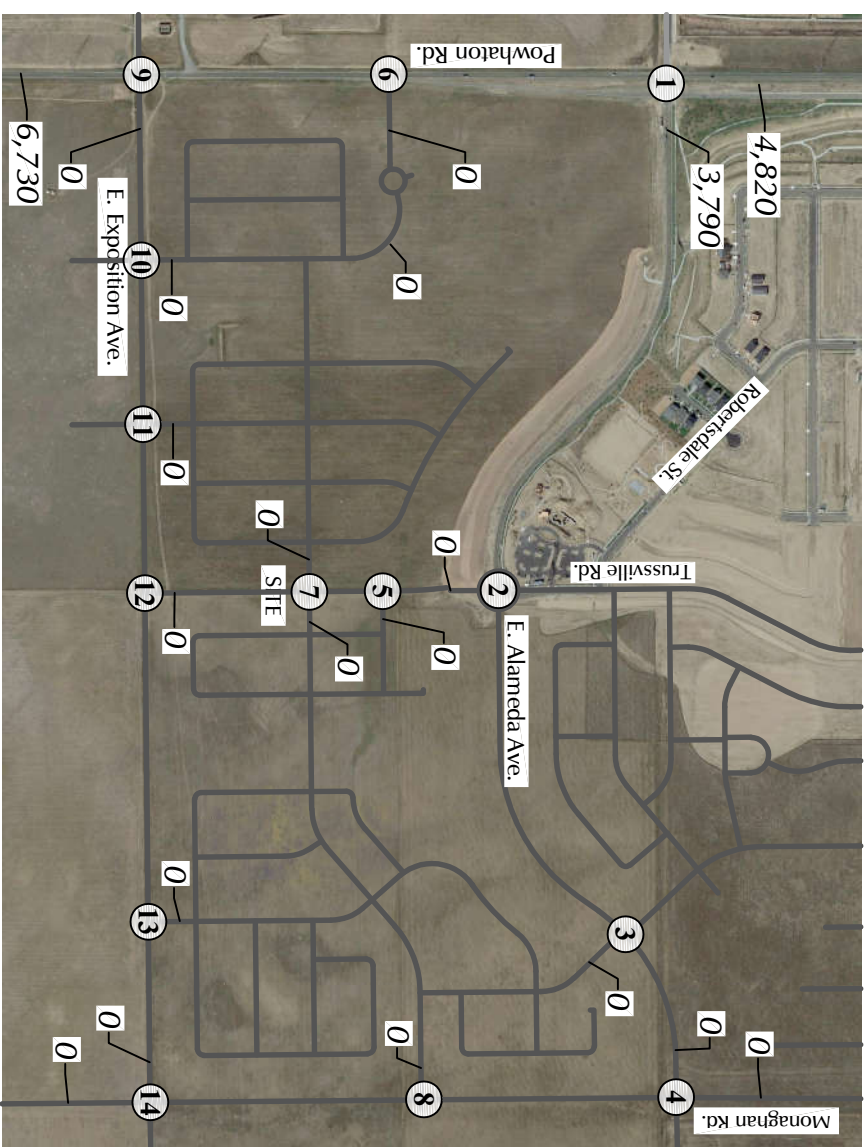
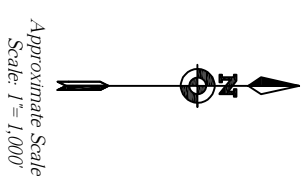


Figure 4
Year 2024 Background Traffic,
Lane Geometry and Traffic Control

1

= Stop Sign

1

= Traffic Signal

1

= Modern Roundabout

26

= AM Peak Hour Traffic

35

= PM Peak Hour Traffic

1,000

= Average Daily Traffic

1

LEGEND:

1

= Stop Sign

1

= Traffic Signal

1

= Modern Roundabout

26

= AM Peak Hour Traffic

35

= PM Peak Hour Traffic

1,000

= Average Daily Traffic

1

LEGEND:

1

= Stop Sign

1

= Traffic Signal

1

= Modern Roundabout

26

= AM Peak Hour Traffic

35

= PM Peak Hour Traffic

1,000

= Average Daily Traffic

1

LEGEND:

1

= Stop Sign

1

= Traffic Signal

1

= Modern Roundabout

26

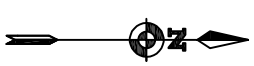
= AM Peak Hour Traffic

35

= PM Peak Hour Traffic

1,000

= Average Daily Traffic



Approximate Scale
Scale: 1"= 1,000'

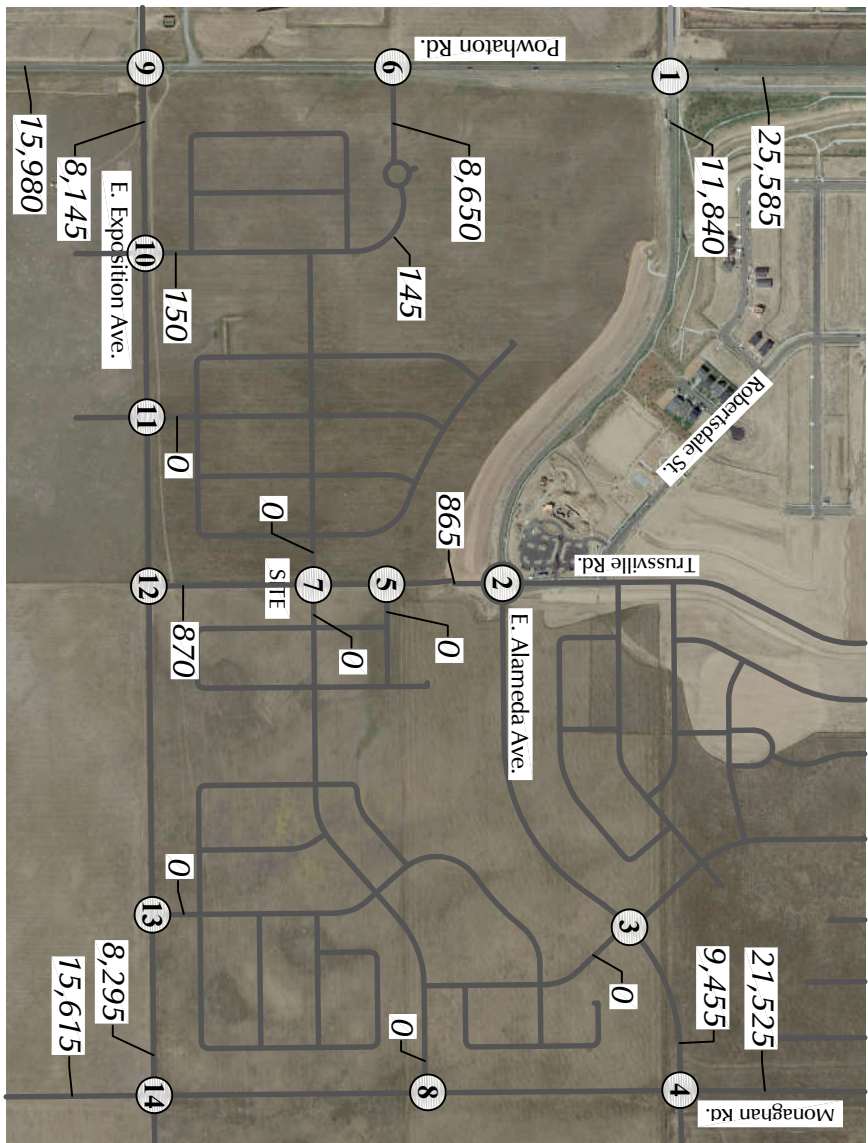
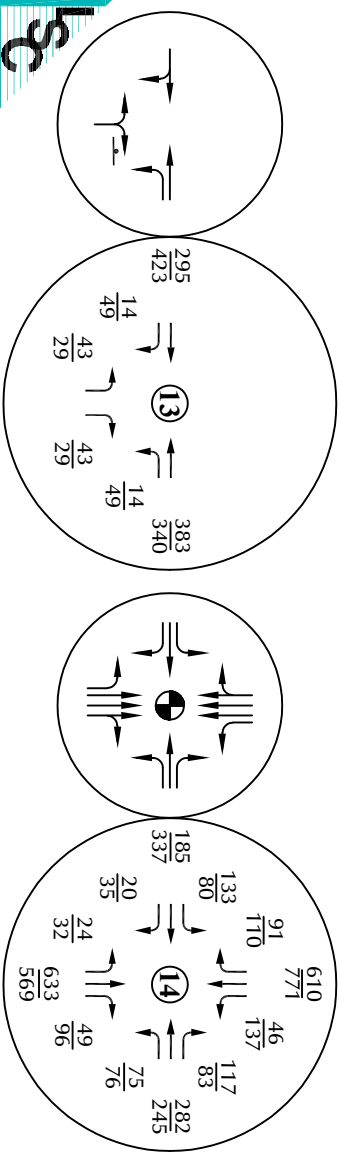
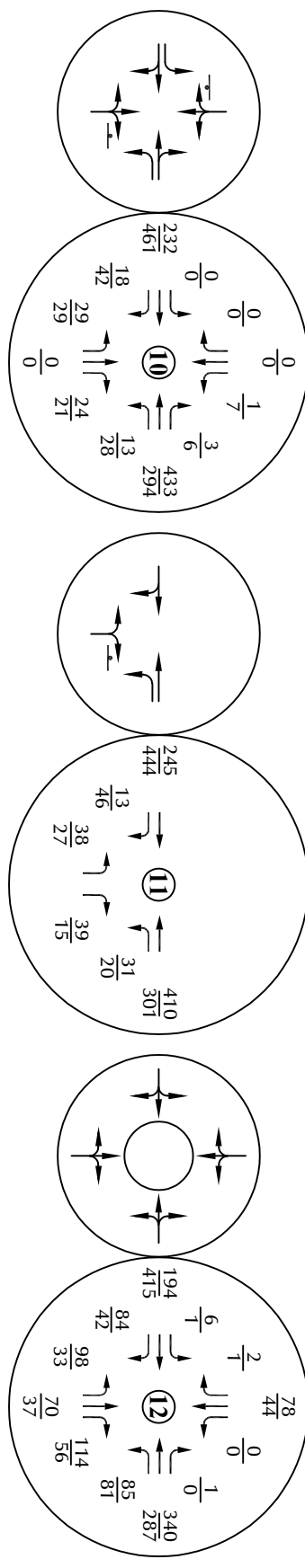
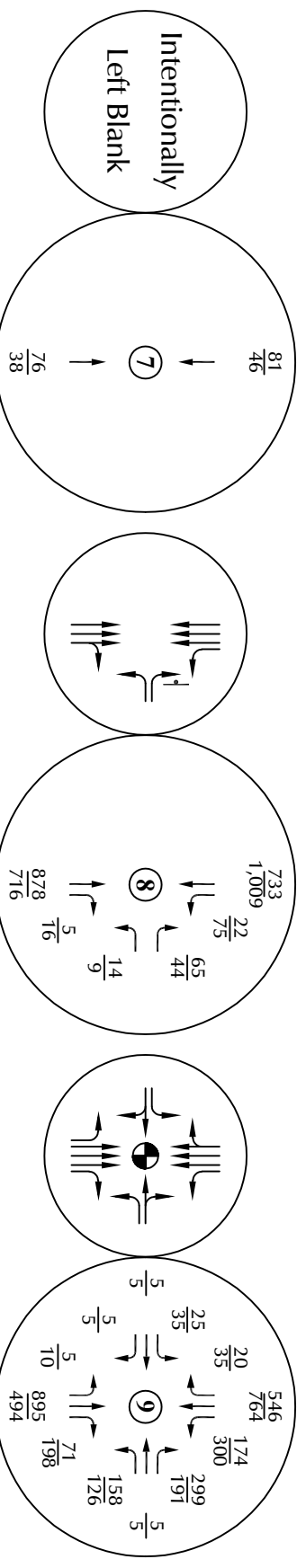
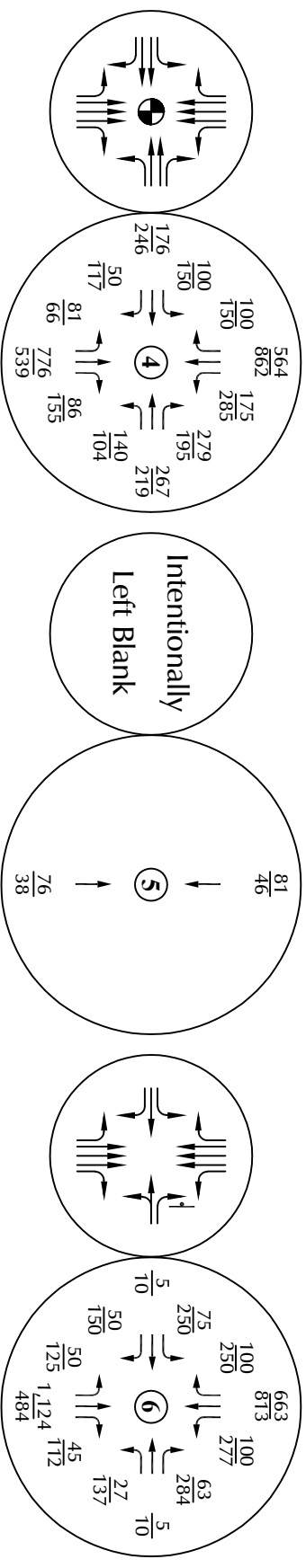
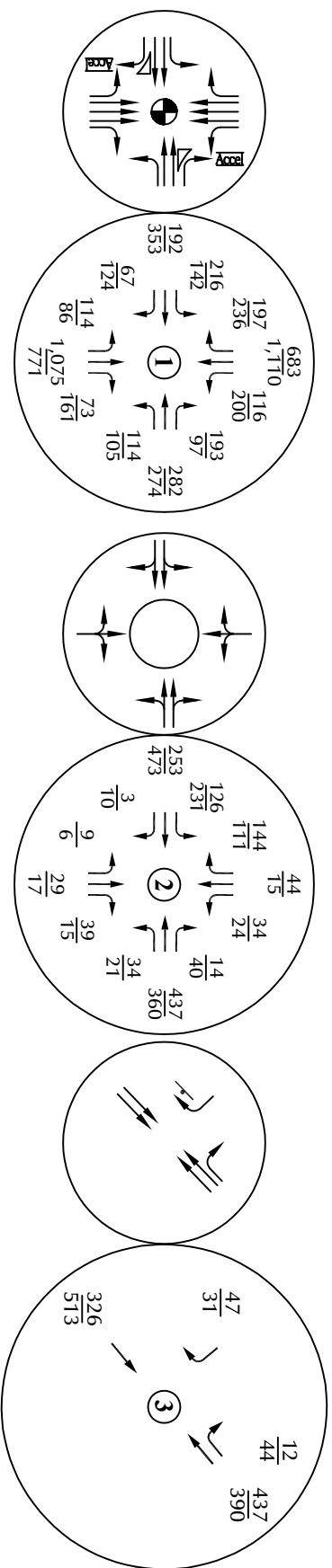
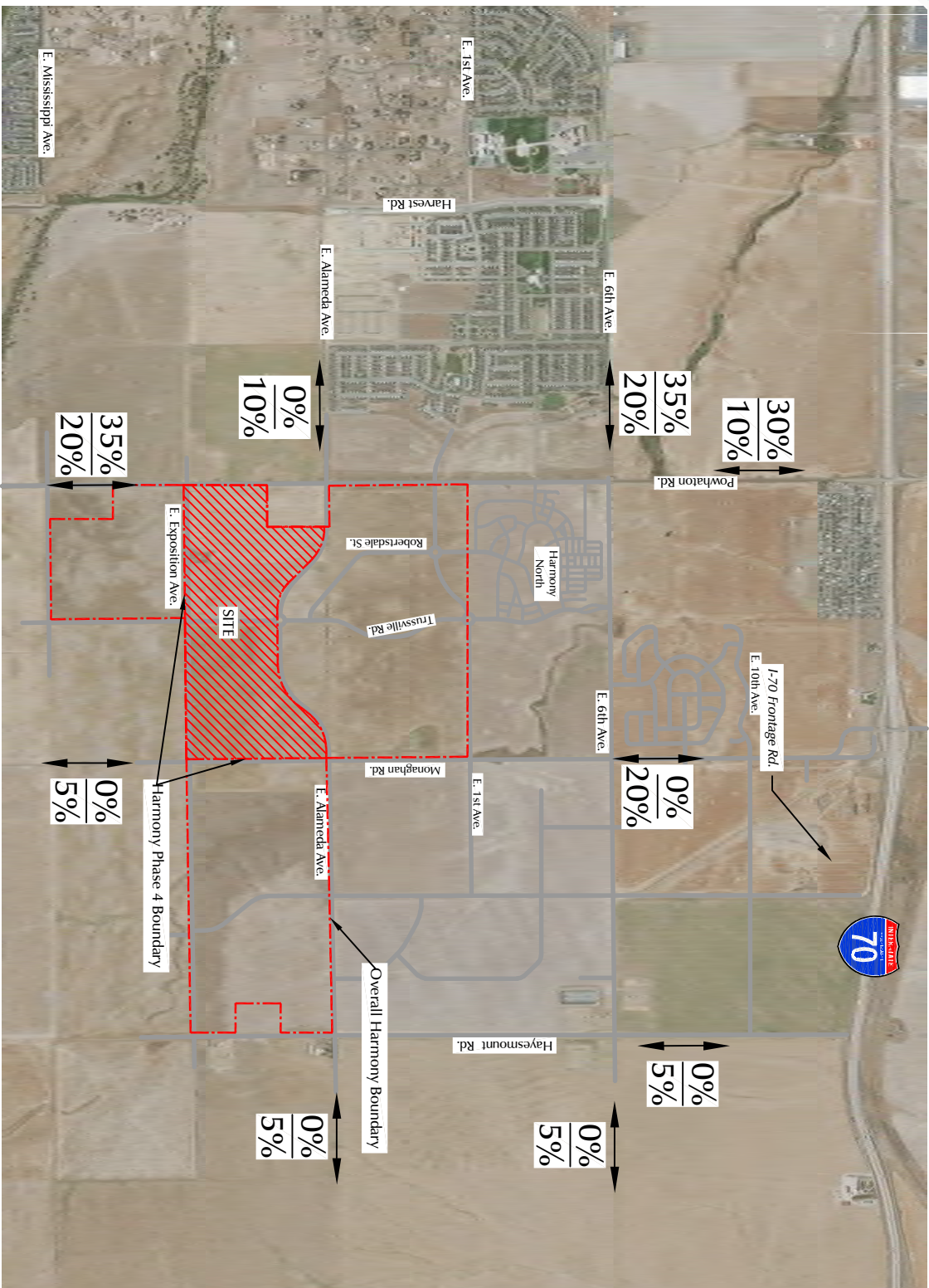


Figure 5
Year 2040 Background Traffic,
Lane Geometry and Traffic Control

Harmony Phase 4 (LSC #200710)



Approximate Scale
Scale: 1"=3,000'

LEGEND:

$$\frac{5\%}{5\%} = \frac{\text{Year 2023 Percent Directional Distribution}}{\text{Year 2040 Percent Directional Distribution}}$$

Figure 6

Directional Distribution of Site-Generated Traffic

Harmony Phase 4 (LSC #200710)

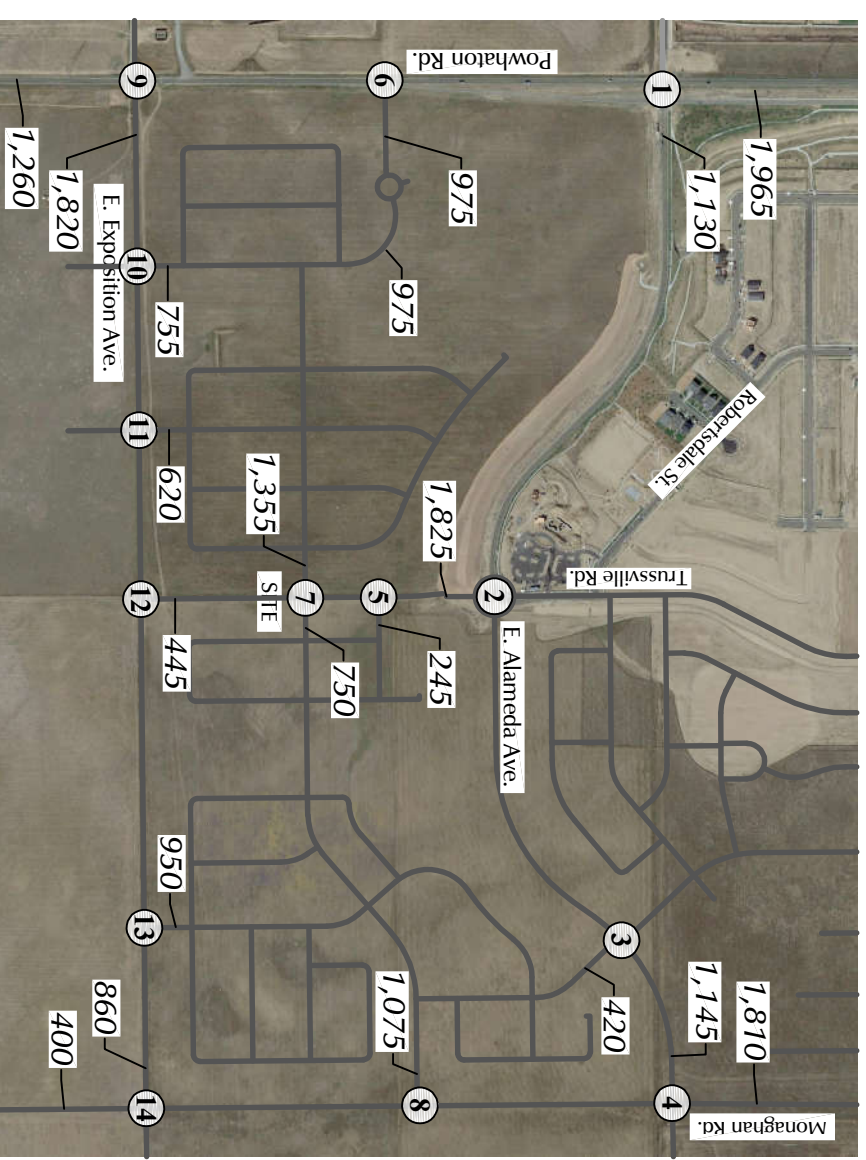
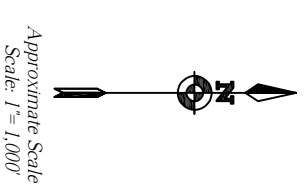
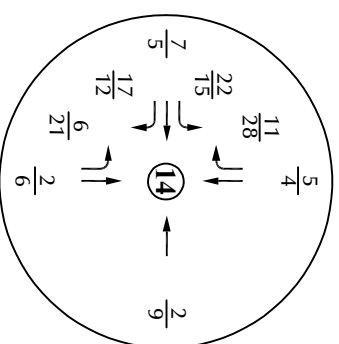
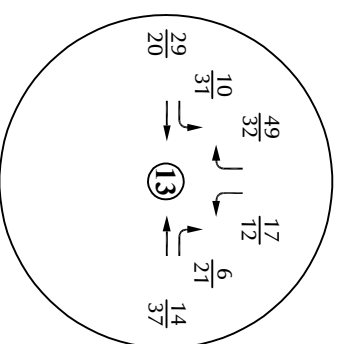
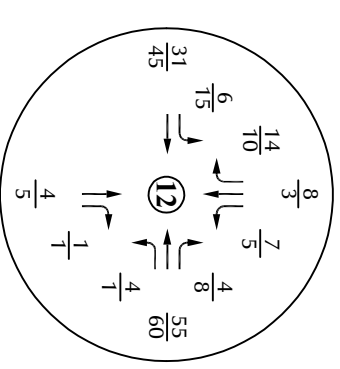
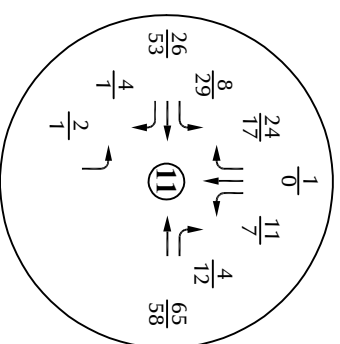
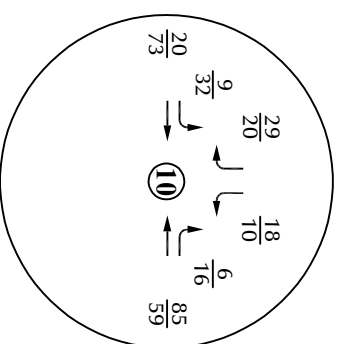
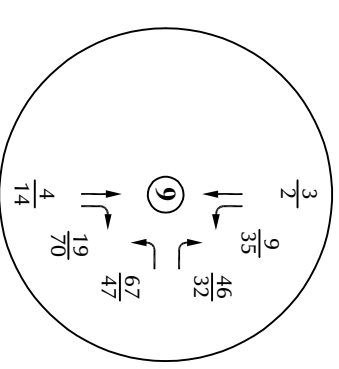
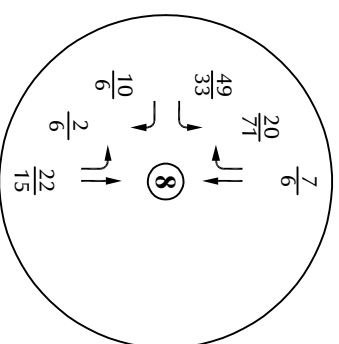
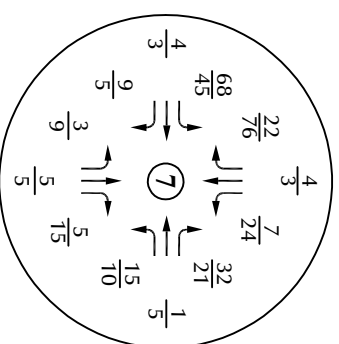
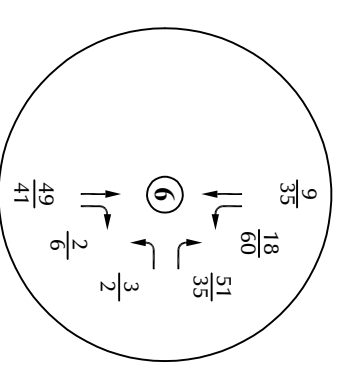
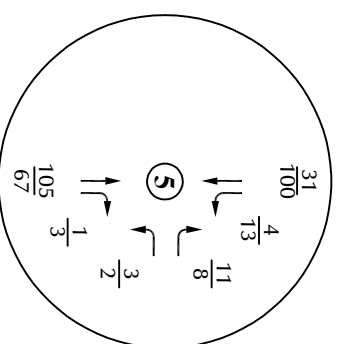
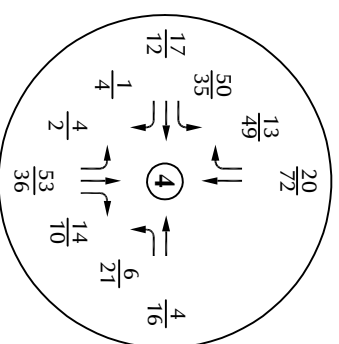
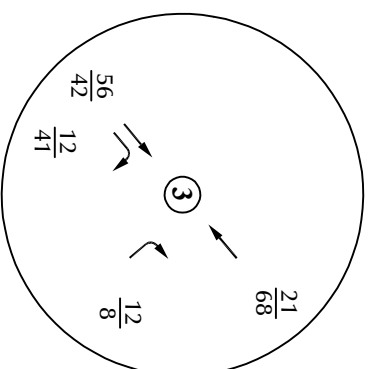
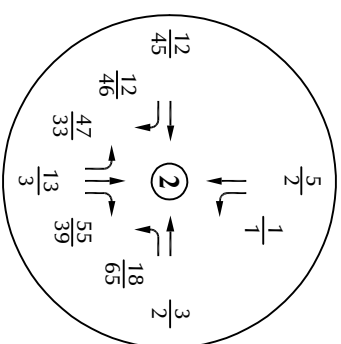
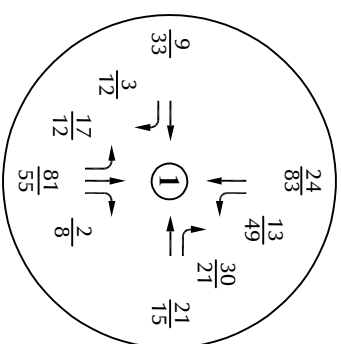
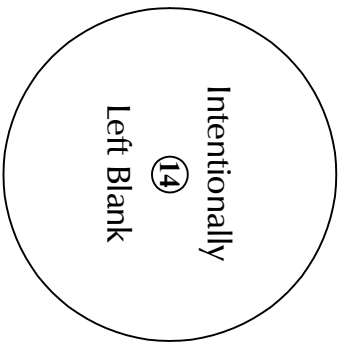
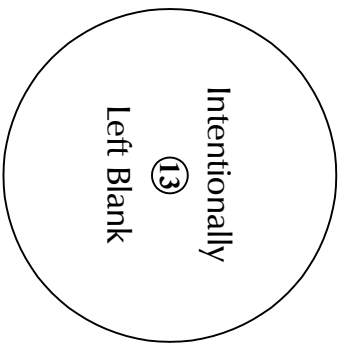
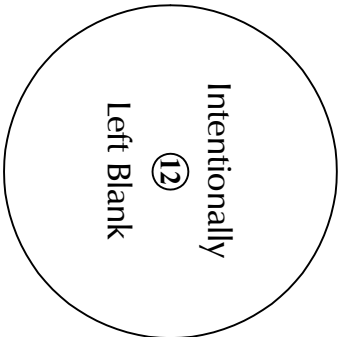
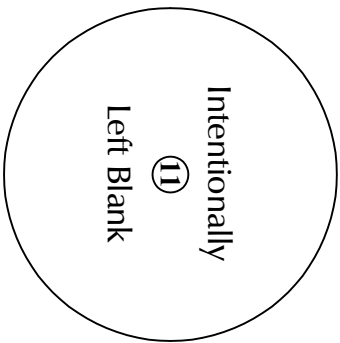
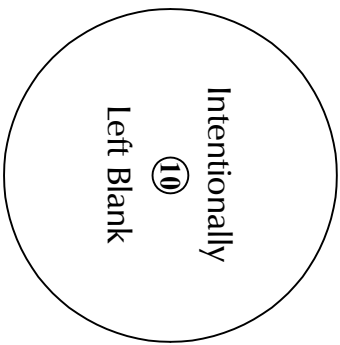
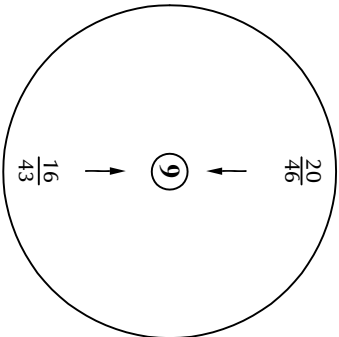
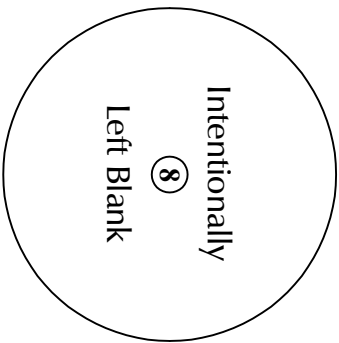
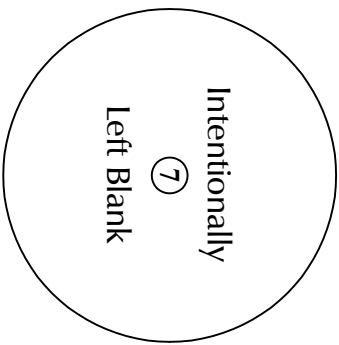
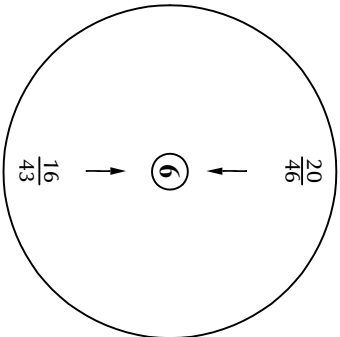
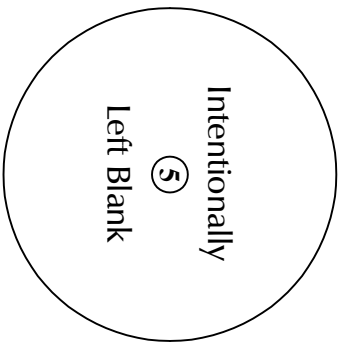
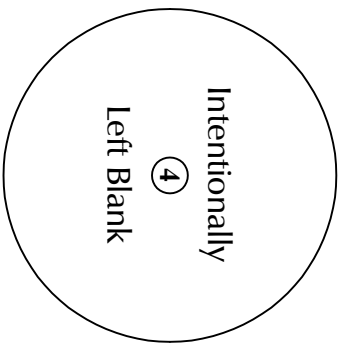
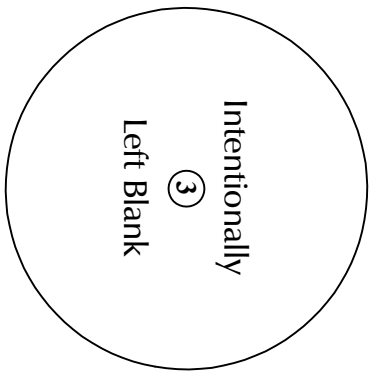
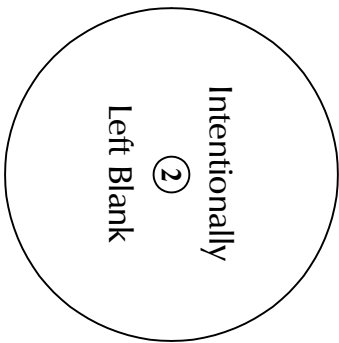
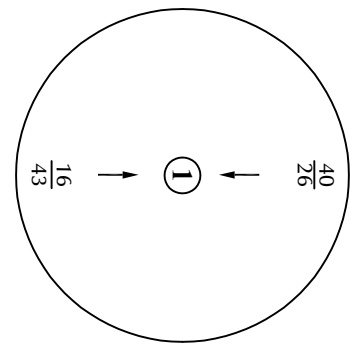


Figure 8

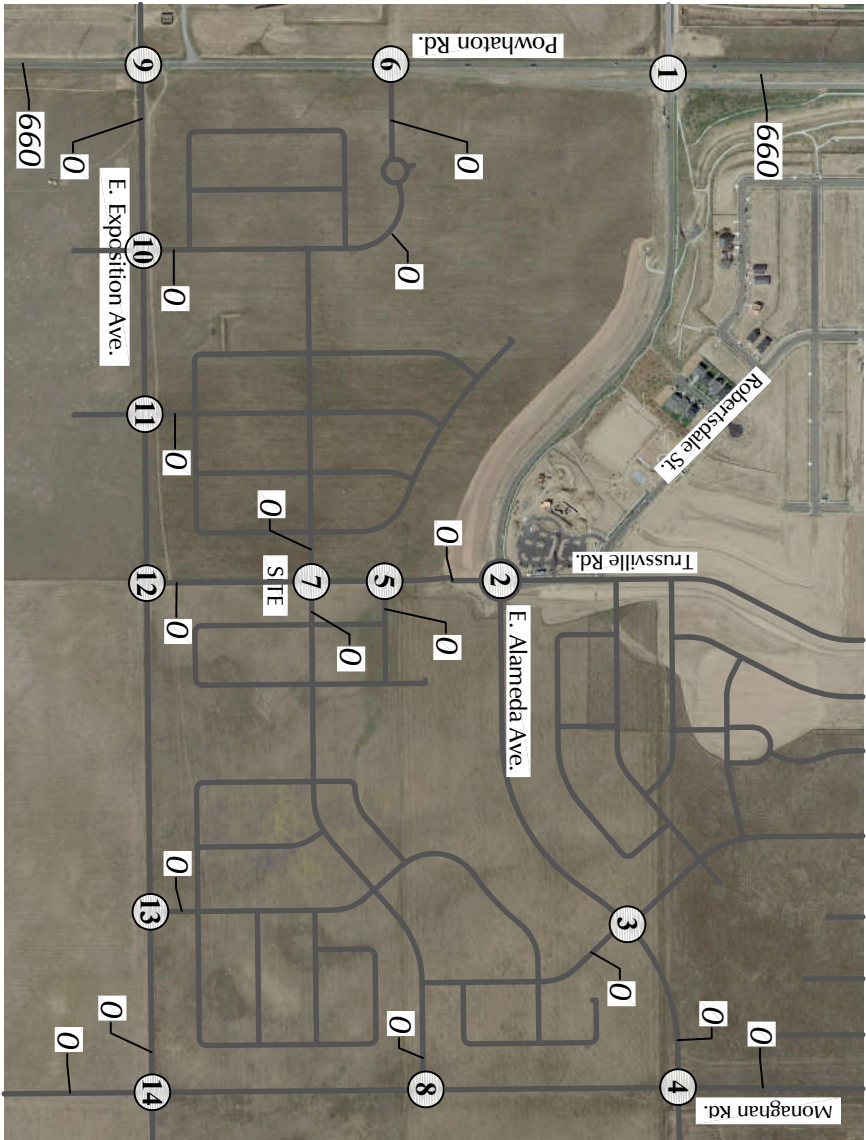
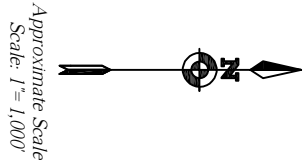
Year 2040 Assignment of Site-Generated Traffic

Harmony Phase 4 (LSC #200710)

<

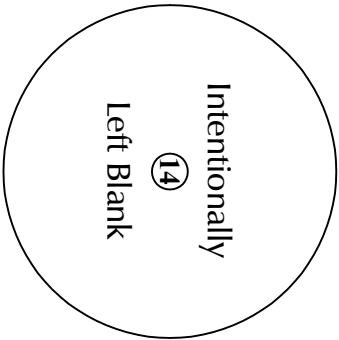
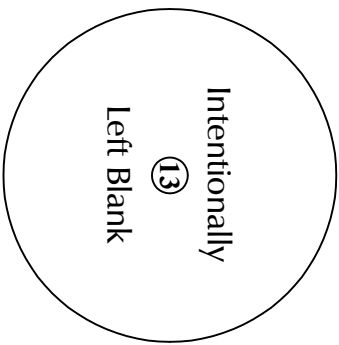
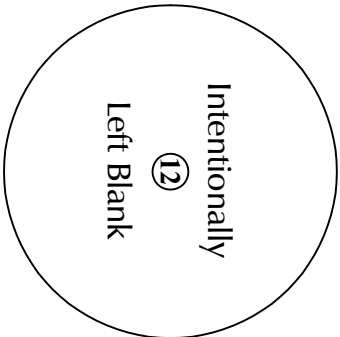
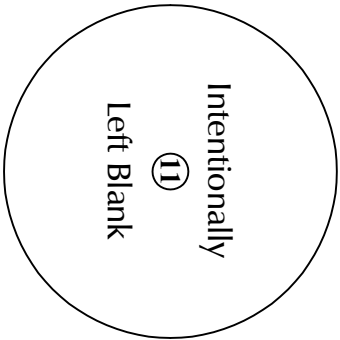
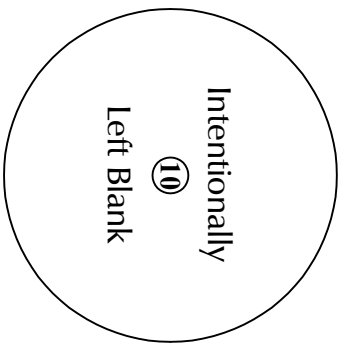
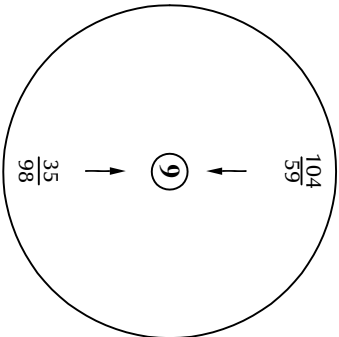
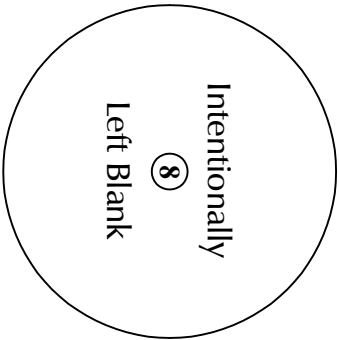
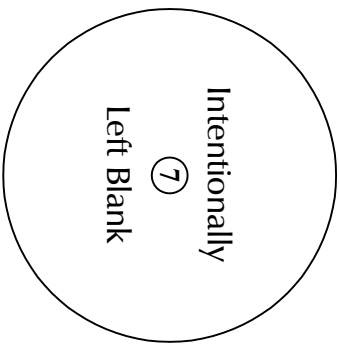
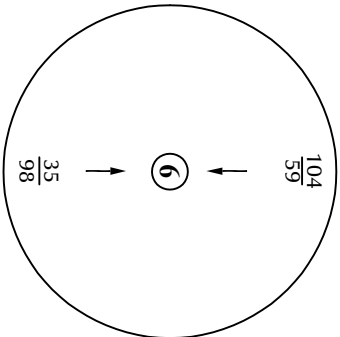
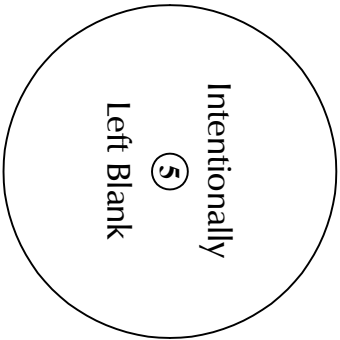
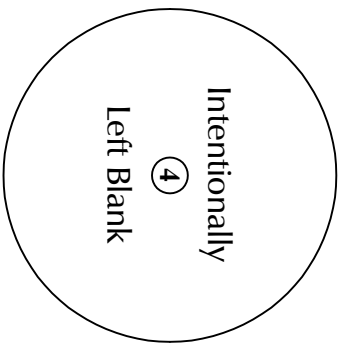
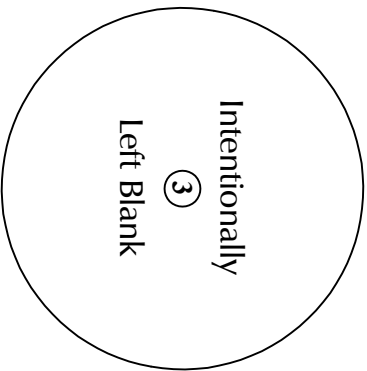
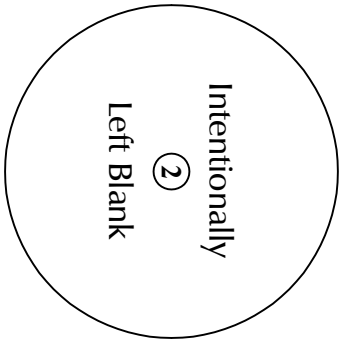
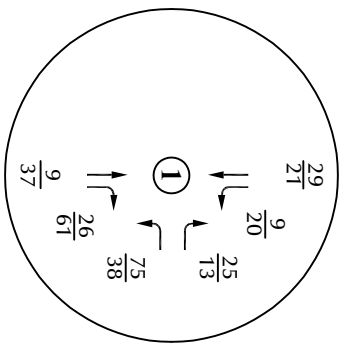


LEGEND:
 $\frac{26}{35}$ = AM Peak Hour Traffic
 = PM Peak Hour Traffic
1,000 = Average Daily Traffic

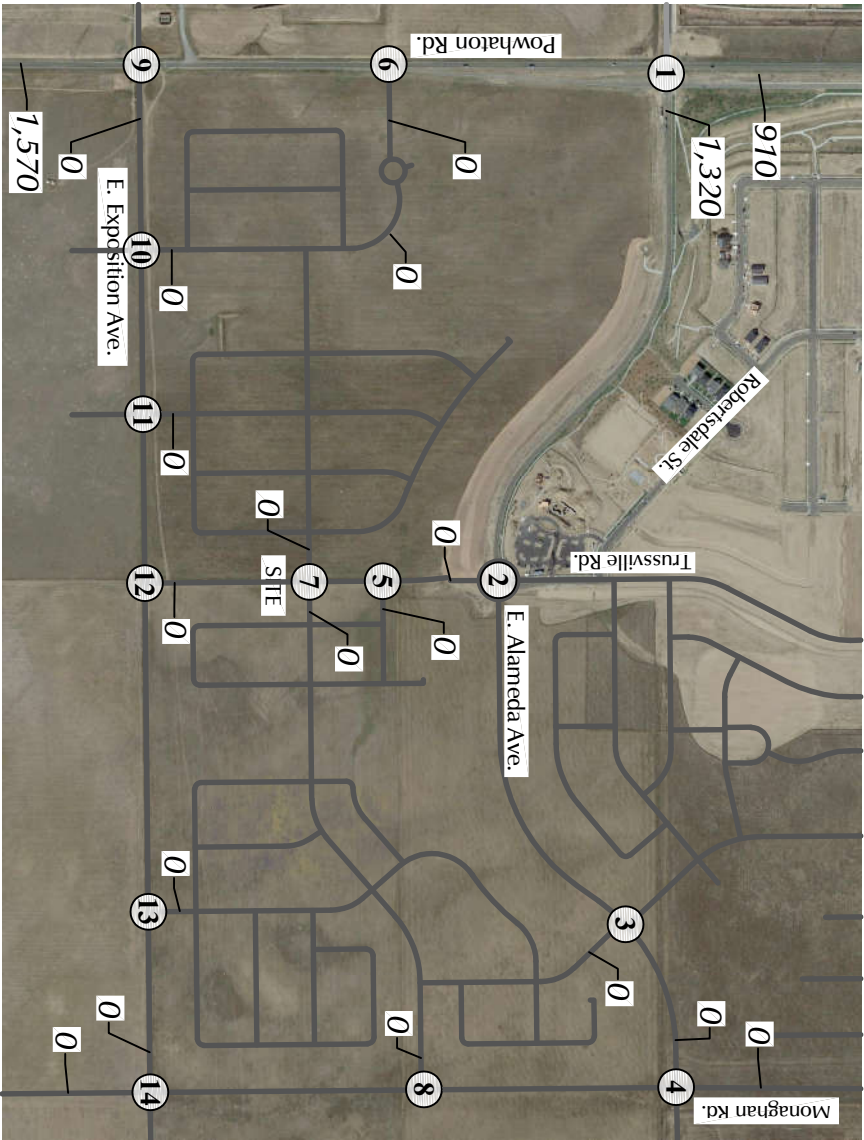
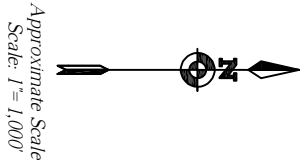


* Based on the Sky Ranch GDP - Neighborhoods A and B Traffic Impact Analysis by LSC Transportation Consultants Inc., July 29, 2020.



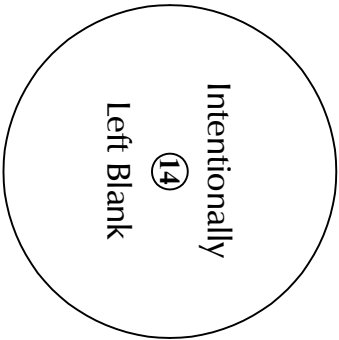
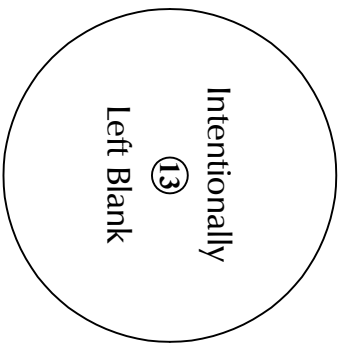
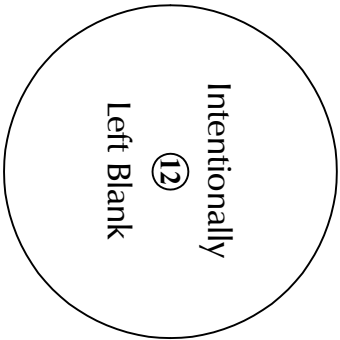
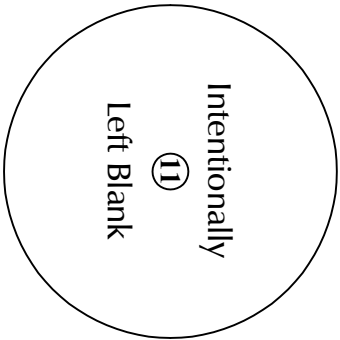
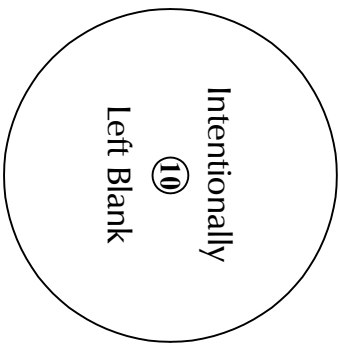
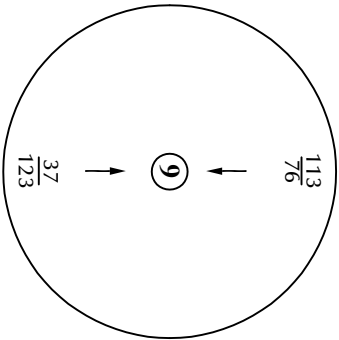
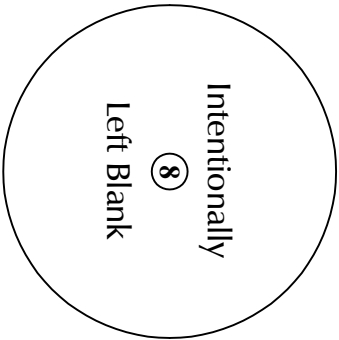
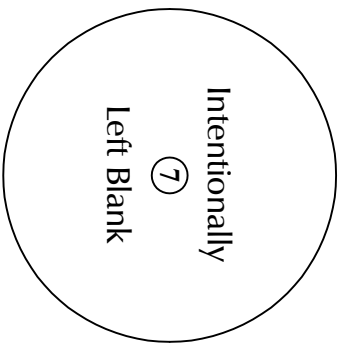
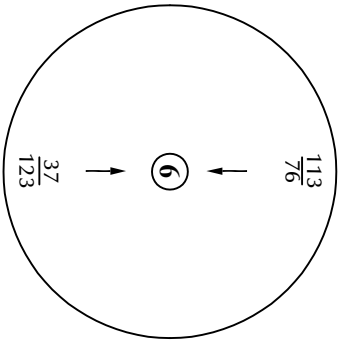
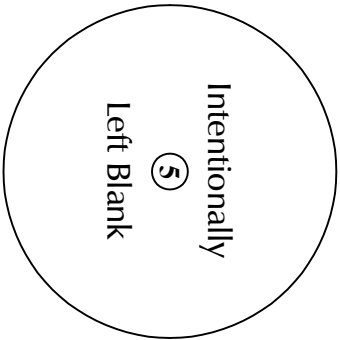
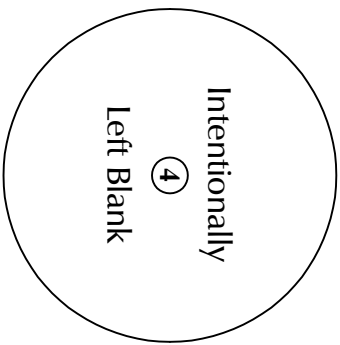
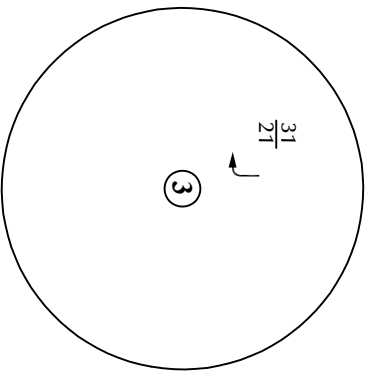
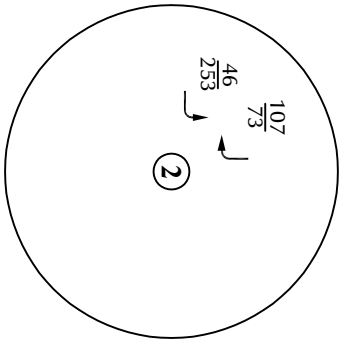
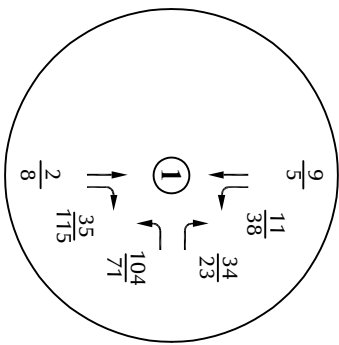


LEGEND:
 $\frac{26}{35}$ = AM Peak Hour Traffic
PM Peak Hour Traffic
1,000 = Average Daily Traffic

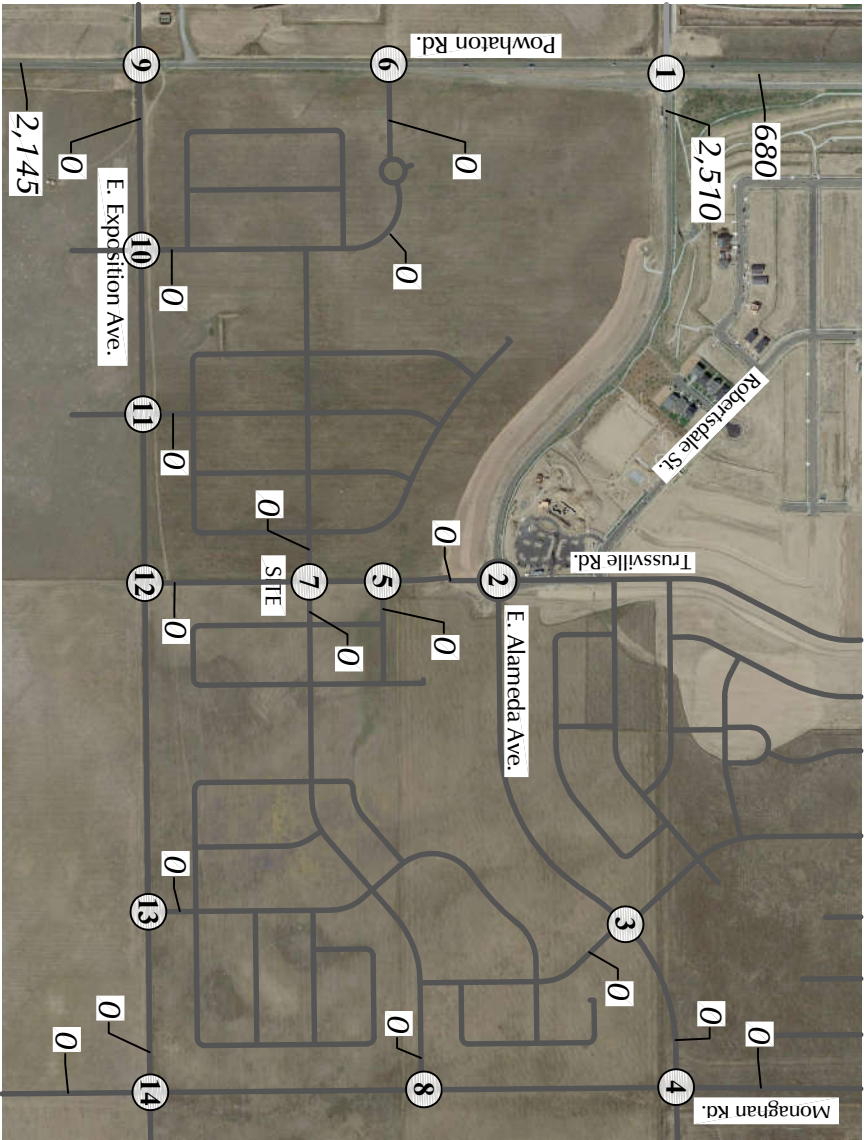
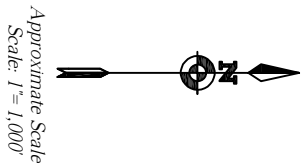


* Harmony Phases 1 and 2 was about half built out at the time traffic counts were conducted.

Appendix Figure 2
Year 2024
Harmony Phase 1 & 2 * Generated Traffic
Harmony Phase 4 (LSC #200710)

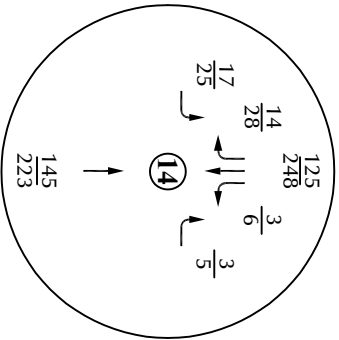
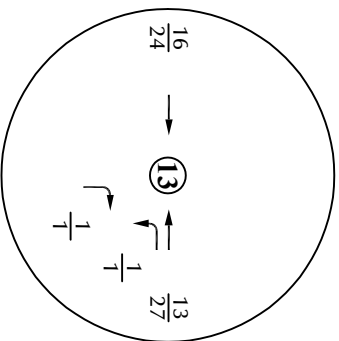
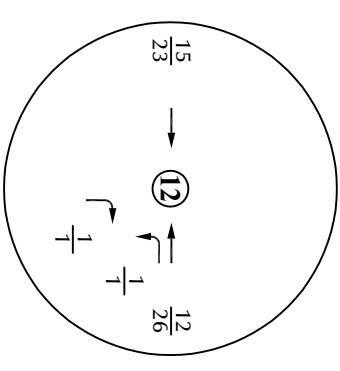
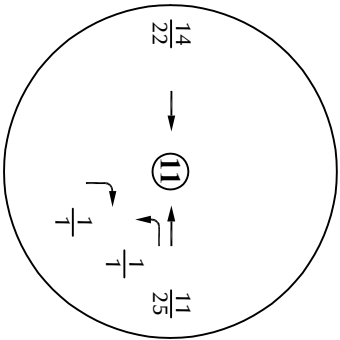
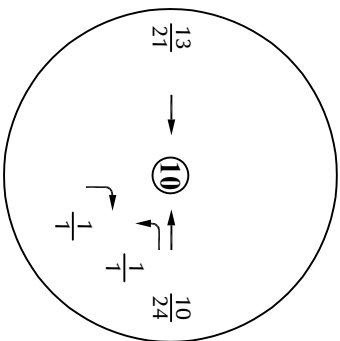
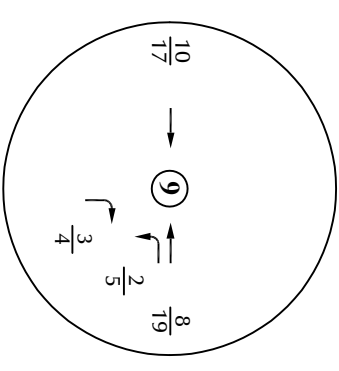
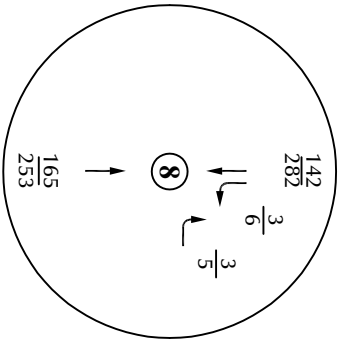
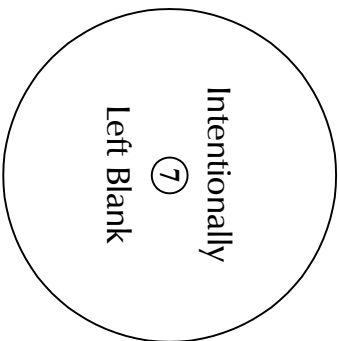
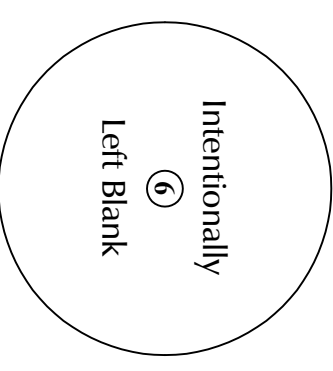
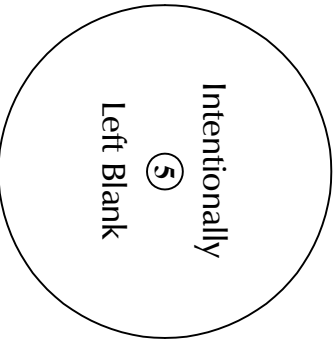
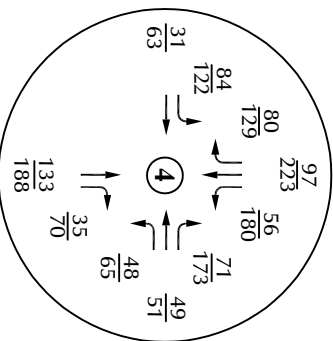
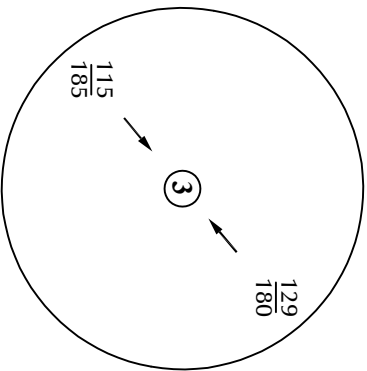
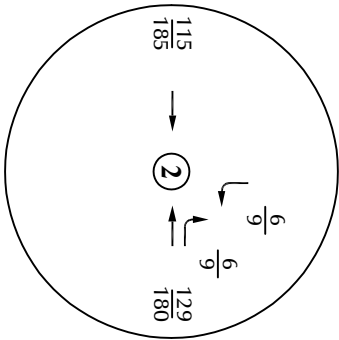
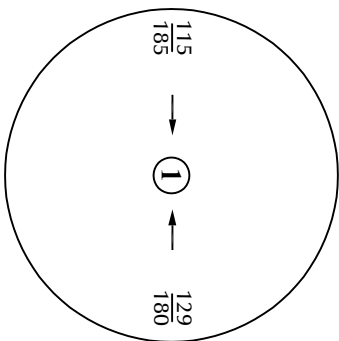


LEGEND:
 $\frac{26}{35}$ = AM Peak Hour Traffic
PM Peak Hour Traffic
1,000 = Average Daily Traffic

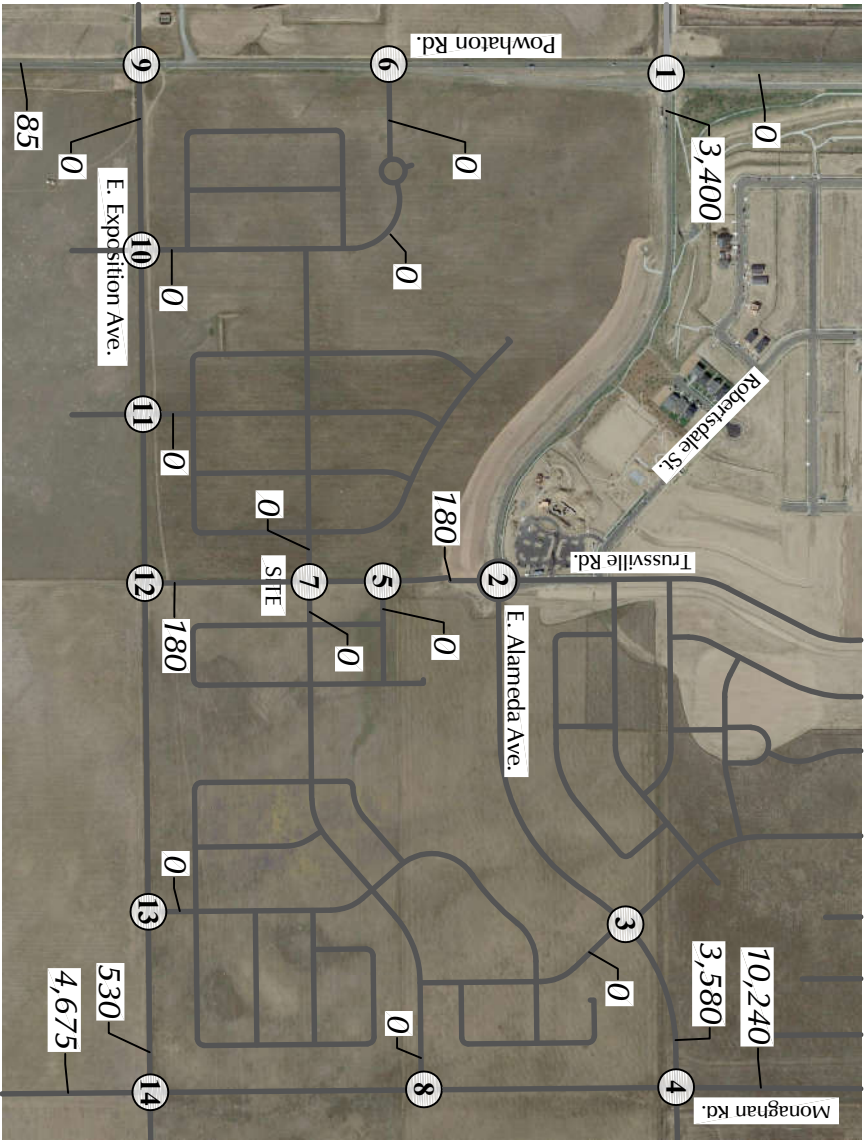
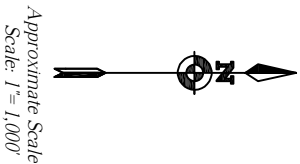


* Based on the Harmony CSP 3 Traffic Impact Analysis by LSC
Transportation Consultants Inc., November 4, 2020.

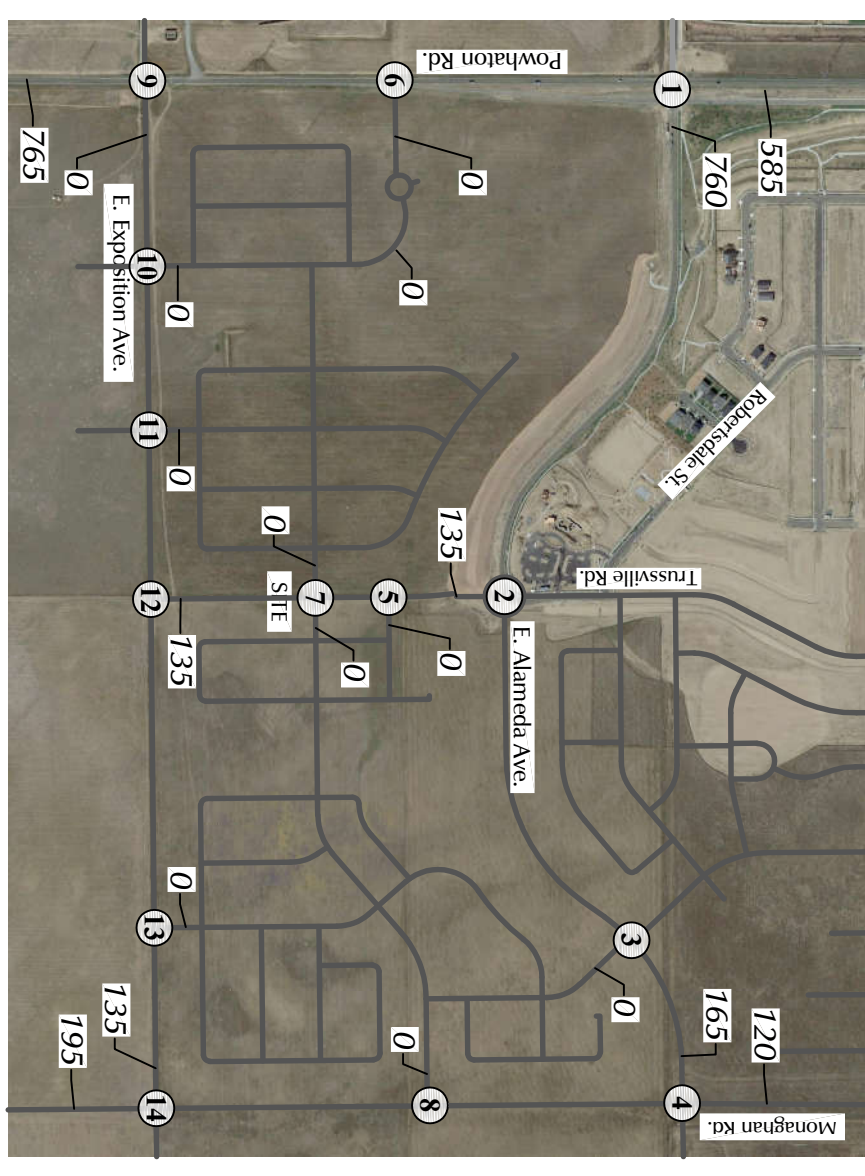
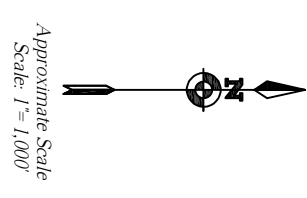
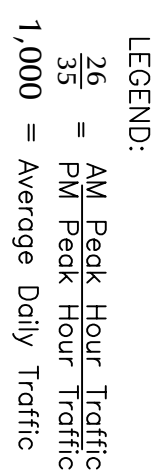
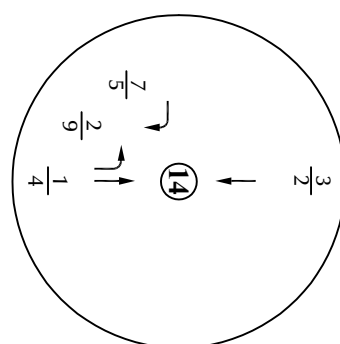
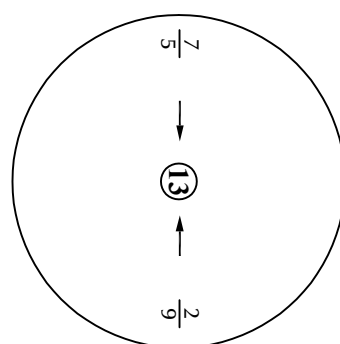
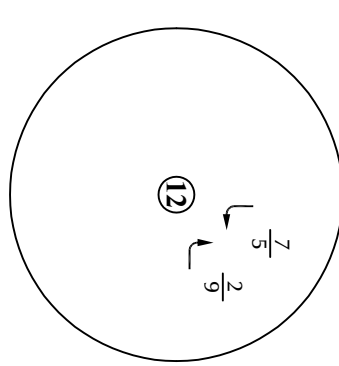
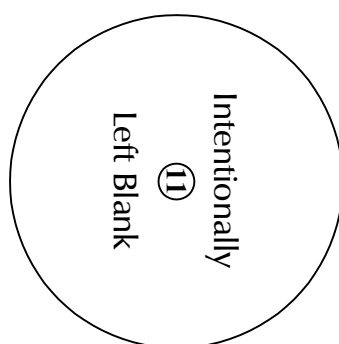
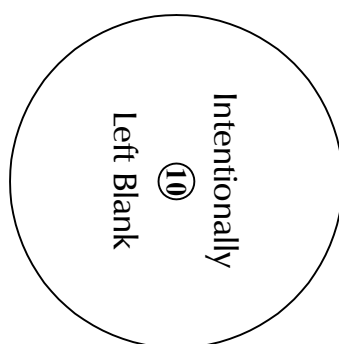
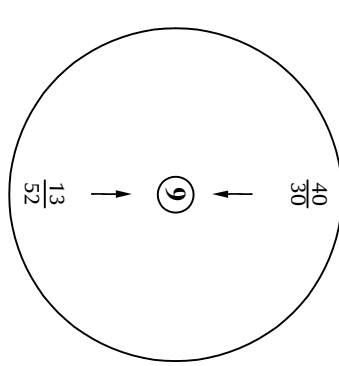
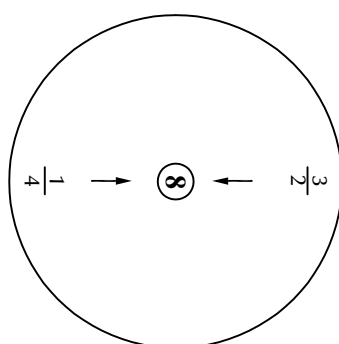
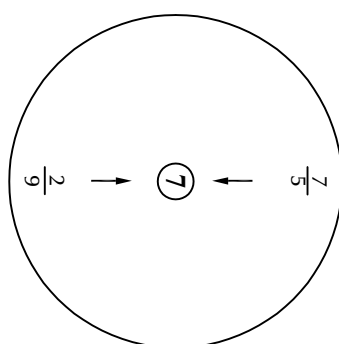
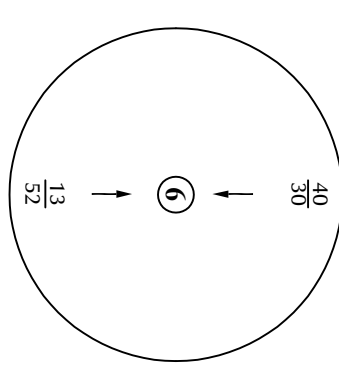
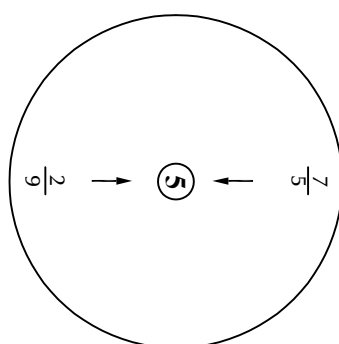
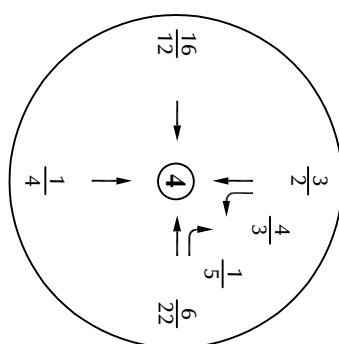
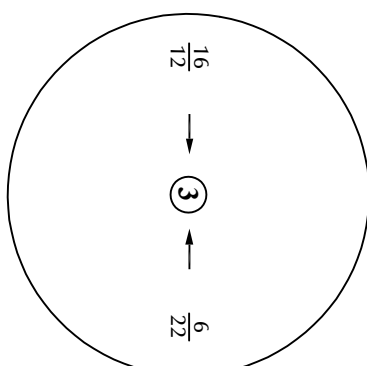
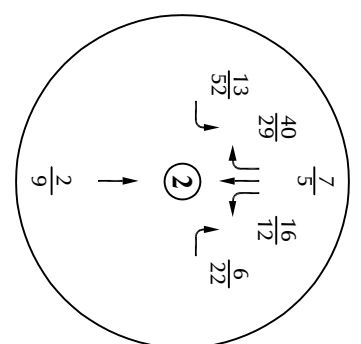
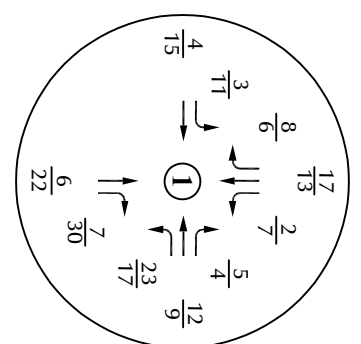


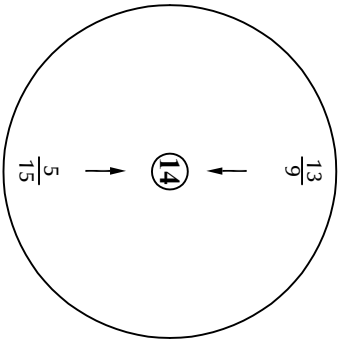
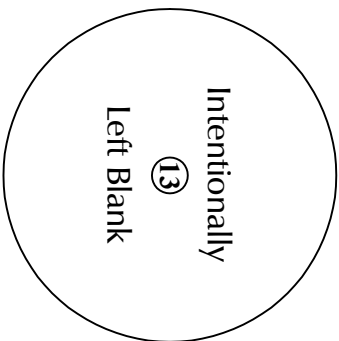
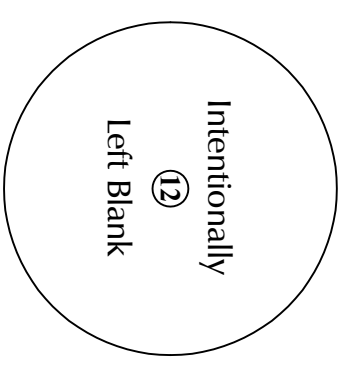
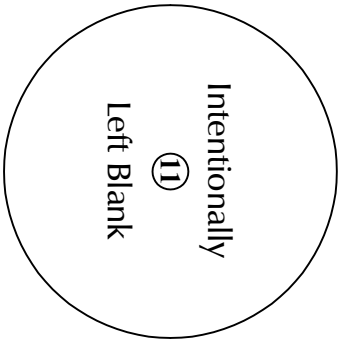
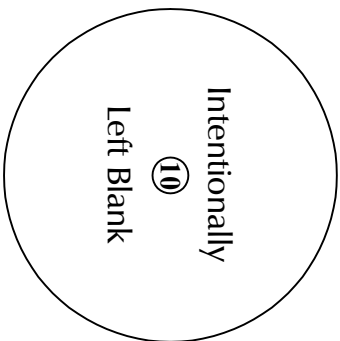
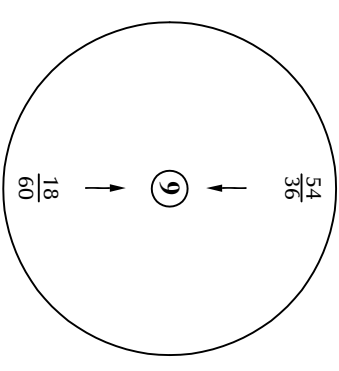
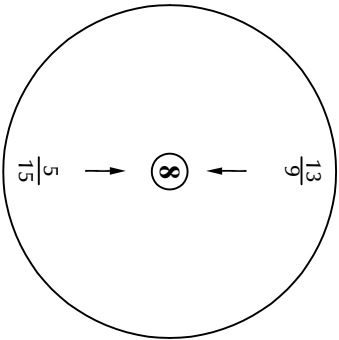
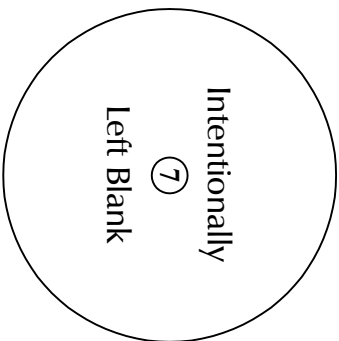
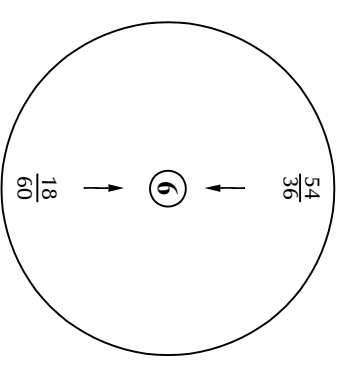
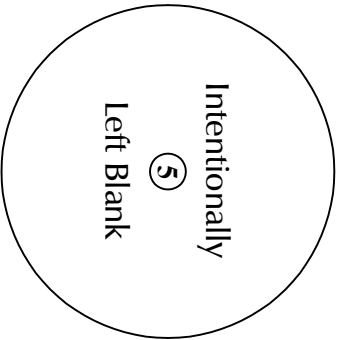
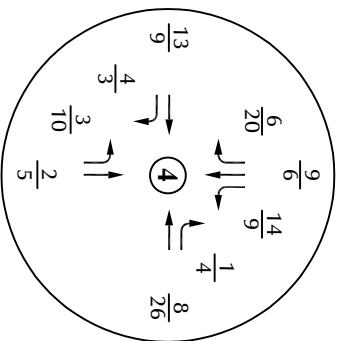
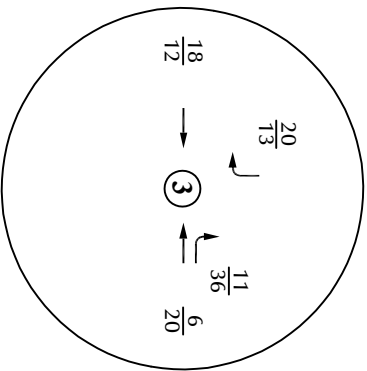
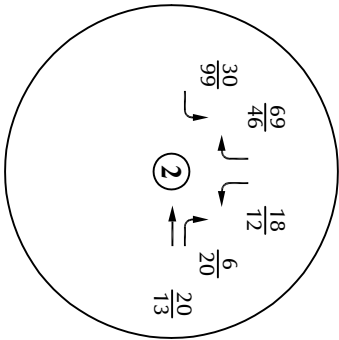
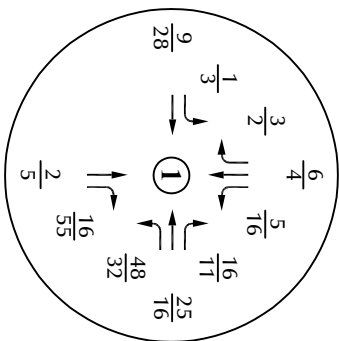


LEGEND:
 $\frac{26}{35}$ = AM Peak Hour Traffic
PM Peak Hour Traffic
1,000 = Average Daily Traffic

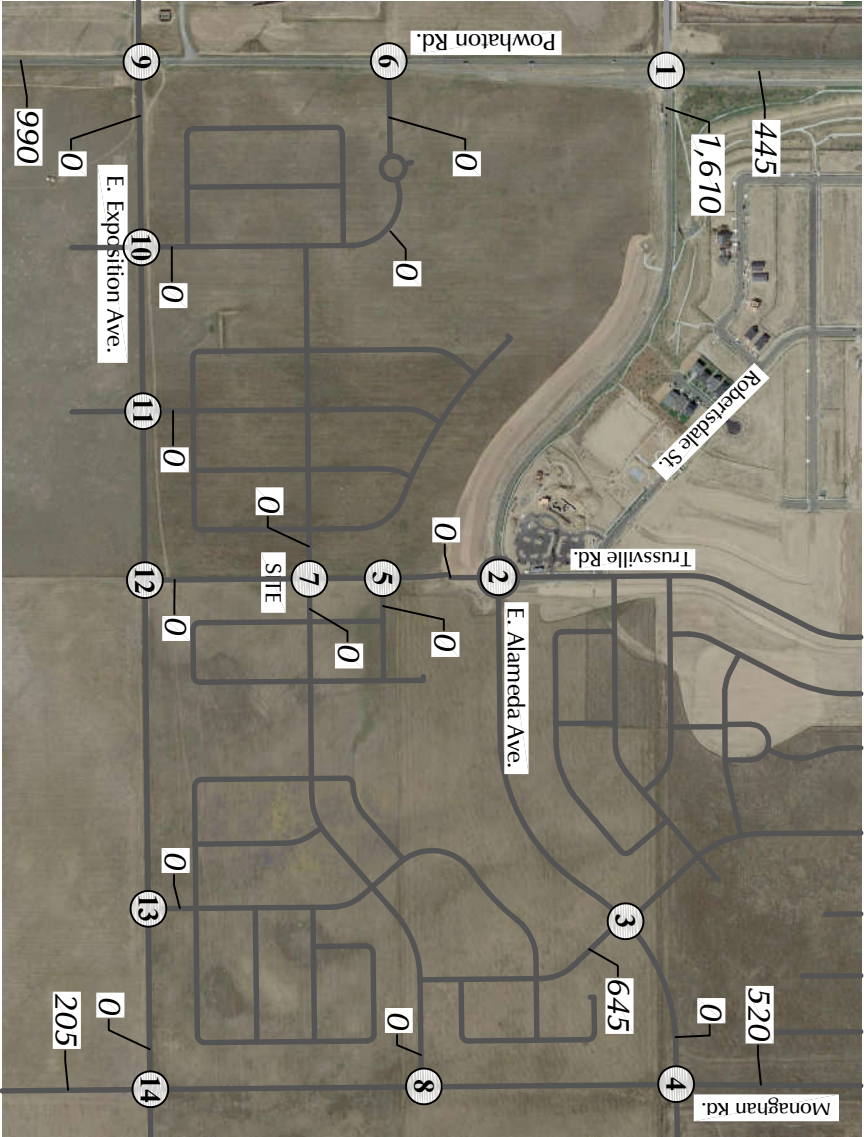
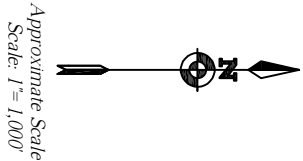


* Based on the Sky Ranch GDP - Neighborhoods A and B Traffic Impact Analysis by LSC Transportation Consultants Inc., July 29, 2020.





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



* Based on the Harmony CSP 3 Traffic Impact Analysis by LSC
Transportation Consultants Inc., November 4, 2020.





LSC TRANSPORTATION CONSULTANTS, INC.

1889 York Street
Denver, CO 80206
(303) 333-1105
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E-mail: lsc@lscdenver.com

July 29, 2020

Mr. Mark Harding
Pure Cycle Corporation
34501 E. Quincy Avenue, Bldg. 34, Box 10
Watkins, CO 80137

Re: Sky Ranch GDP -
Neighborhoods A and B
Traffic Impact Analysis
Arapahoe County, CO
LSC #181150
Arapahoe County Case No.
GDP18-007/PP18-001

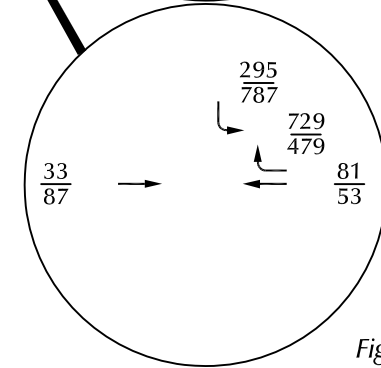
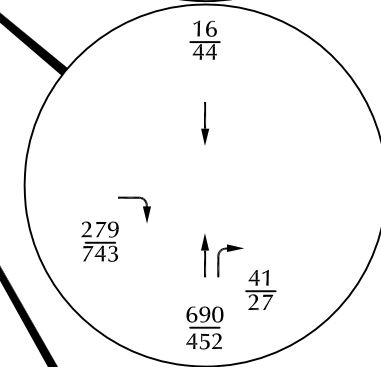
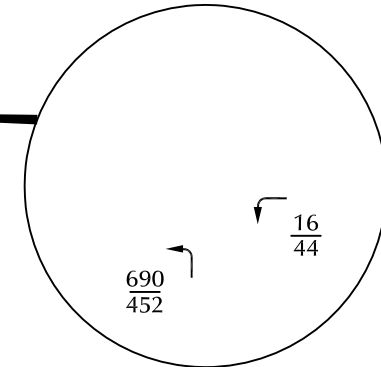
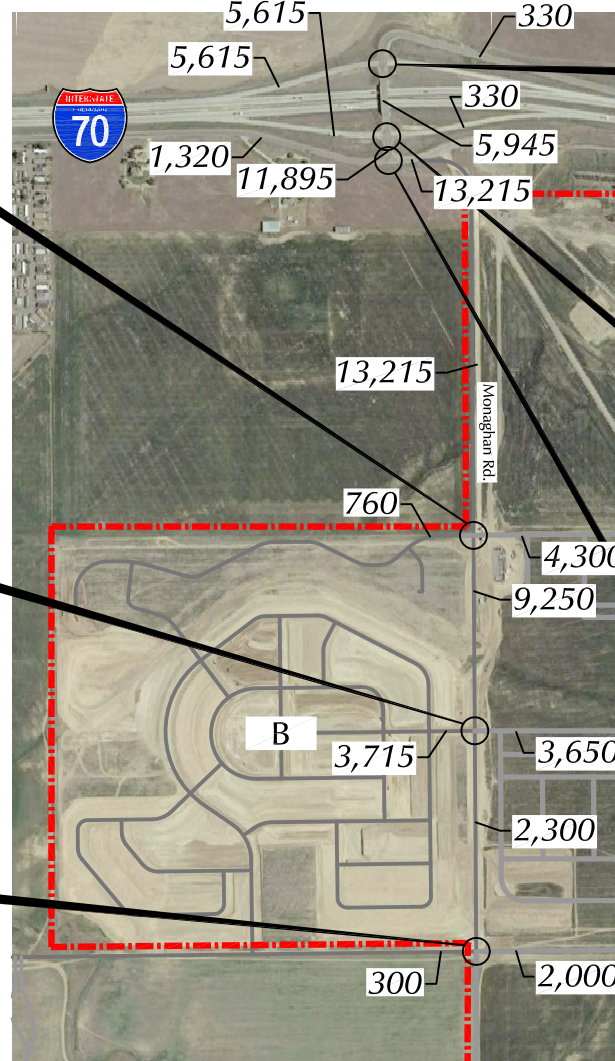
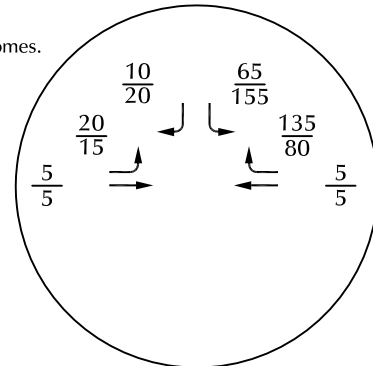
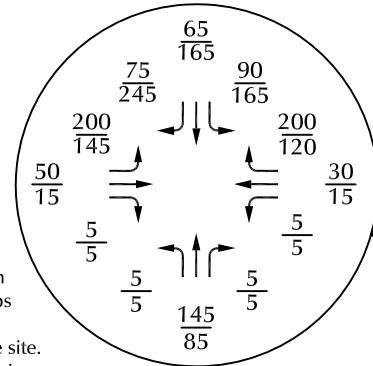
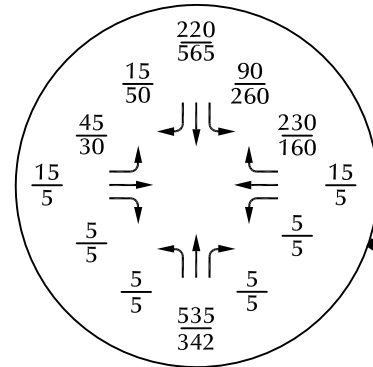
Dear Mr. Harding:

In response to your request, LSC Transportation Consultants, Inc. has prepared this updated traffic study for the proposed Sky Ranch GDP - Neighborhoods A and B to address County and CDOT comments to support the overall Sky Ranch GDP. The study focuses on the buildout impacts of Neighborhoods A and B plus the traffic equivalent of about 293 additional single-family detached homes with only interim improvements to the I-70/ Monaghan Road interchange. The additional traffic equivalent from 293 homes may be located in Neighborhoods D, E, or F and could be generated by residential or non-residential land uses. The study also provides an assignment of the overall Sky Ranch site-generated trips once the area roadway network is completed as well as the estimated 2040 total daily traffic on the major roadways in the study area. Arapahoe County, David Evans & Associates, and others recently began the *I-70 Airpark & Watkins Interchange Study* to explore the most appropriate interim and ultimate configuration for interchange improvements. The study team has determined the existing bridge over I-70 is in good condition, so there will likely be phased interchange improvements proposed. As shown on Figure 1, the site is located south of I-70 between Powhaton Road and Hayesmount Road in Arapahoe County, Colorado.

This Traffic Impact Analysis is intended to be read in conjunction with the Traffic Impact Analysis being conducted by David Evans & Associates regarding interim improvements for the Airpark (Monaghan)/I-70 Interchange, under which certain interchange improvements will accommodate the trip generation equivalency of 1,450 single-family homes.

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



- Notes:
1. Assumes only 10 percent of Recreation Center trips and 10 percent of school trips impact the I-70 interchange because the balance are assumed to be internal to the site.
 2. The trip assignment show is the daily trip generation potential equivalent of 1,400 single-family detached homes.
 3. 13,215 trips/9.44 trips/day = 1,400 homes.

LEGEND:

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

Year 2024 Assignment of Site-Generated Traffic for Neighborhoods A & B plus up to 293 Additional Single Family Homes

Sky Ranch Neighborhoods A & B (LSC #181150)

Figure 6

Note: These projections are based on the recently updated NEATS Study and the land use proposed for the site.

LEGEND:

1,000 = Average Daily Traffic

4 = Recommended Number of Proposed Through Lanes

* May need to be 4 lanes adjacent to Monaghan Road.



Approximate Scale
Scale: 1"= 2,000'

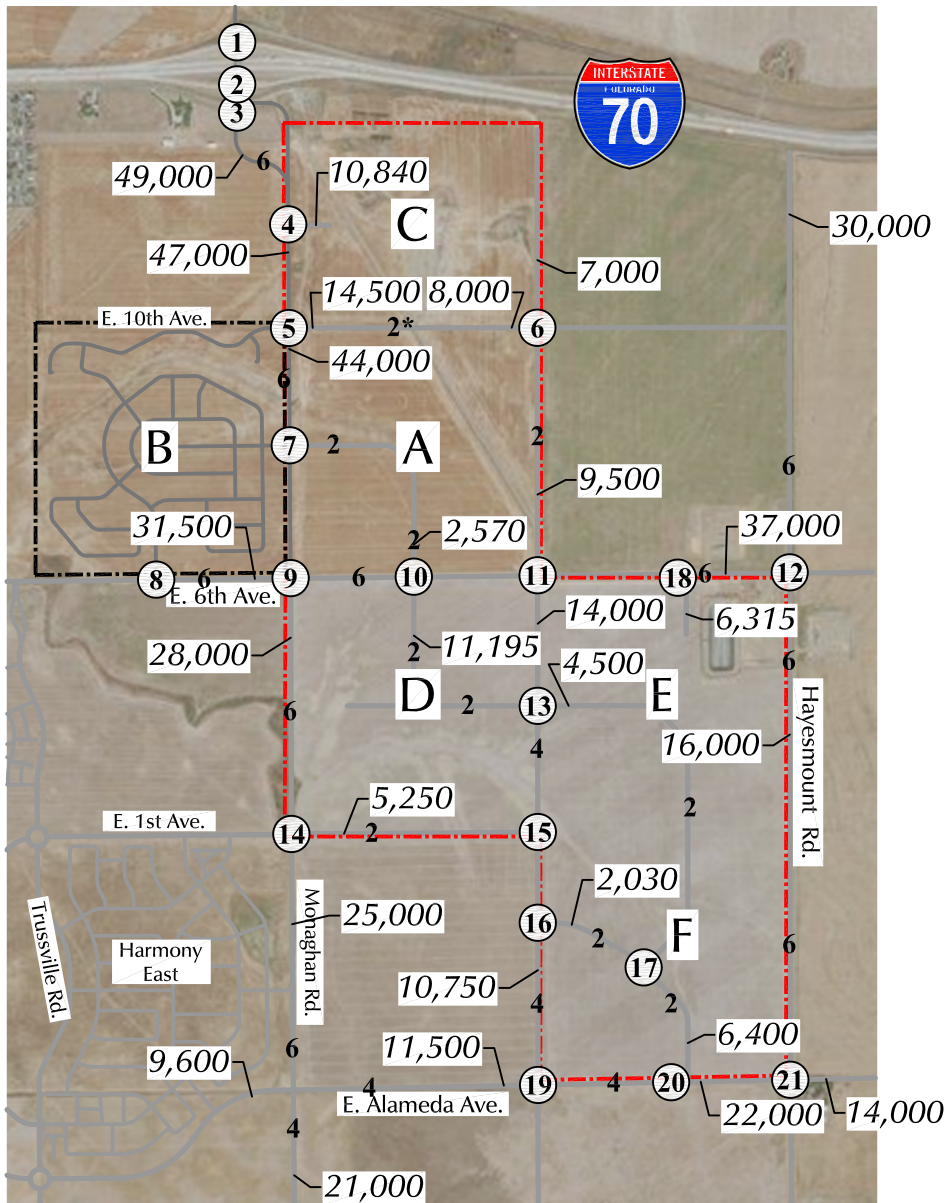


Figure 12

Buildout Total Daily Traffic Volumes

Sky Ranch Neighborhoods A & B (LSC #181150)



LSC TRANSPORTATION CONSULTANTS, INC.

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November 4, 2020

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

Re: Harmony CSP 3
Aurora, CO
LSC #190710

Dear Mr. Spehalski:

In response to your request, LSC Transportation Consultants, Inc. has prepared this updated traffic impact analysis for the proposed Harmony CSP 3 development to address City comments. As shown on Figure 1, the site is located south of E. 1st Avenue and east of Trussville 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.

LAND USE AND ACCESS

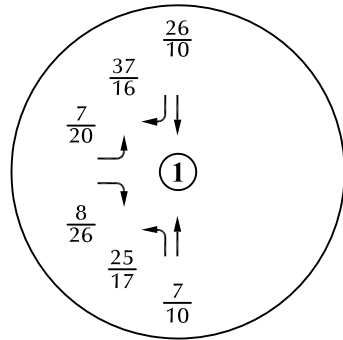
The site is proposed to include about 439 single-family dwelling units, about 72 townhomes, and a 10,000 square-foot fire station. Access is proposed from several locations to Trussville Road, E. 1st Avenue, and E. Alameda Avenue. Figure 2 shows the conceptual site plan.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

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

- **E. 1st Avenue** is an east-west, two-lane collector roadway planned north of the site. The intersection with Trussville Road will be a modern single-lane roundabout.

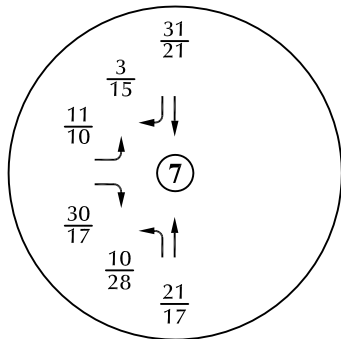
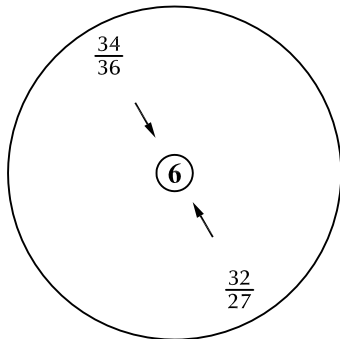


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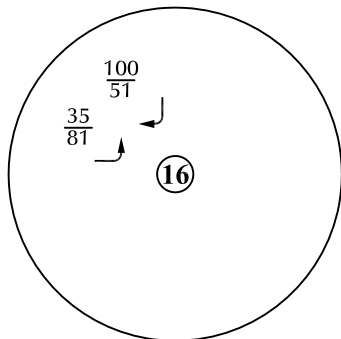
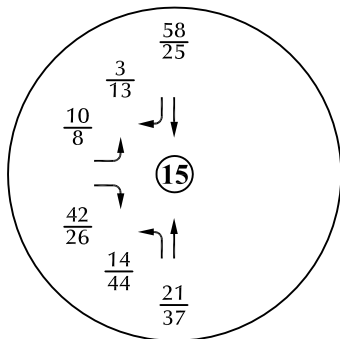
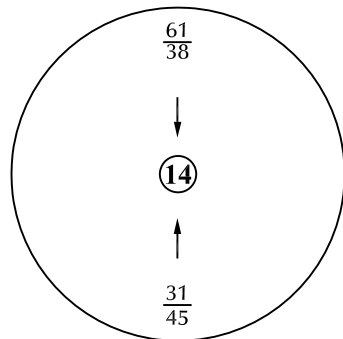
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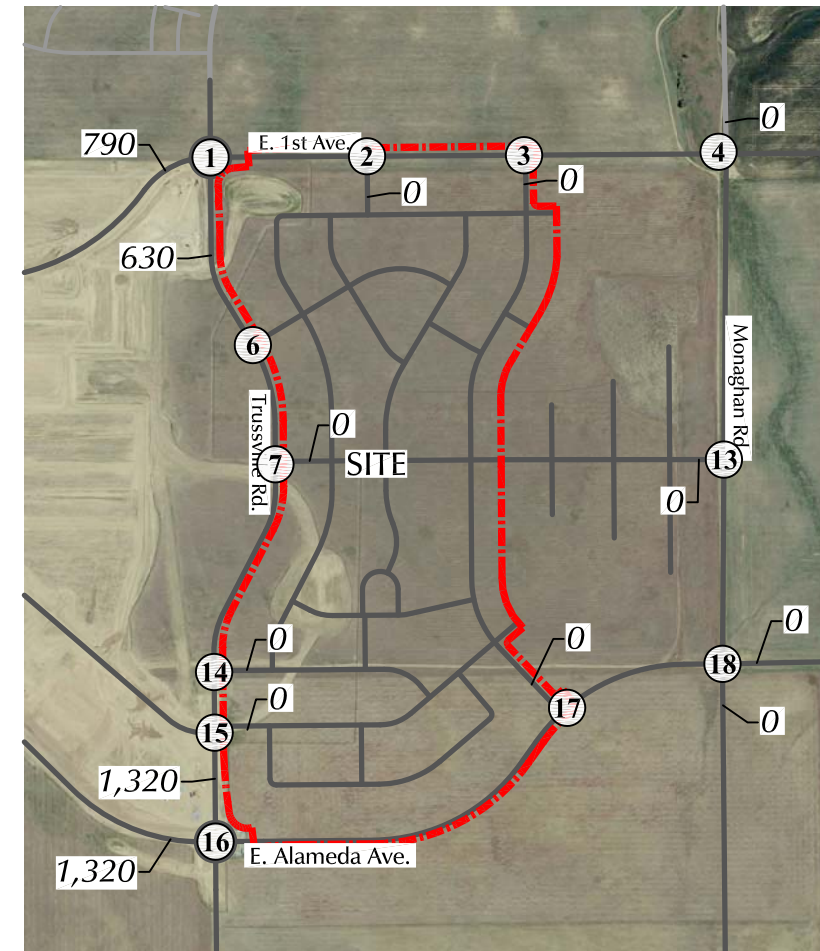
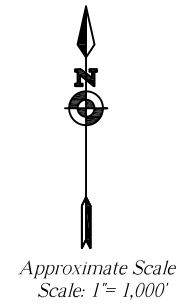


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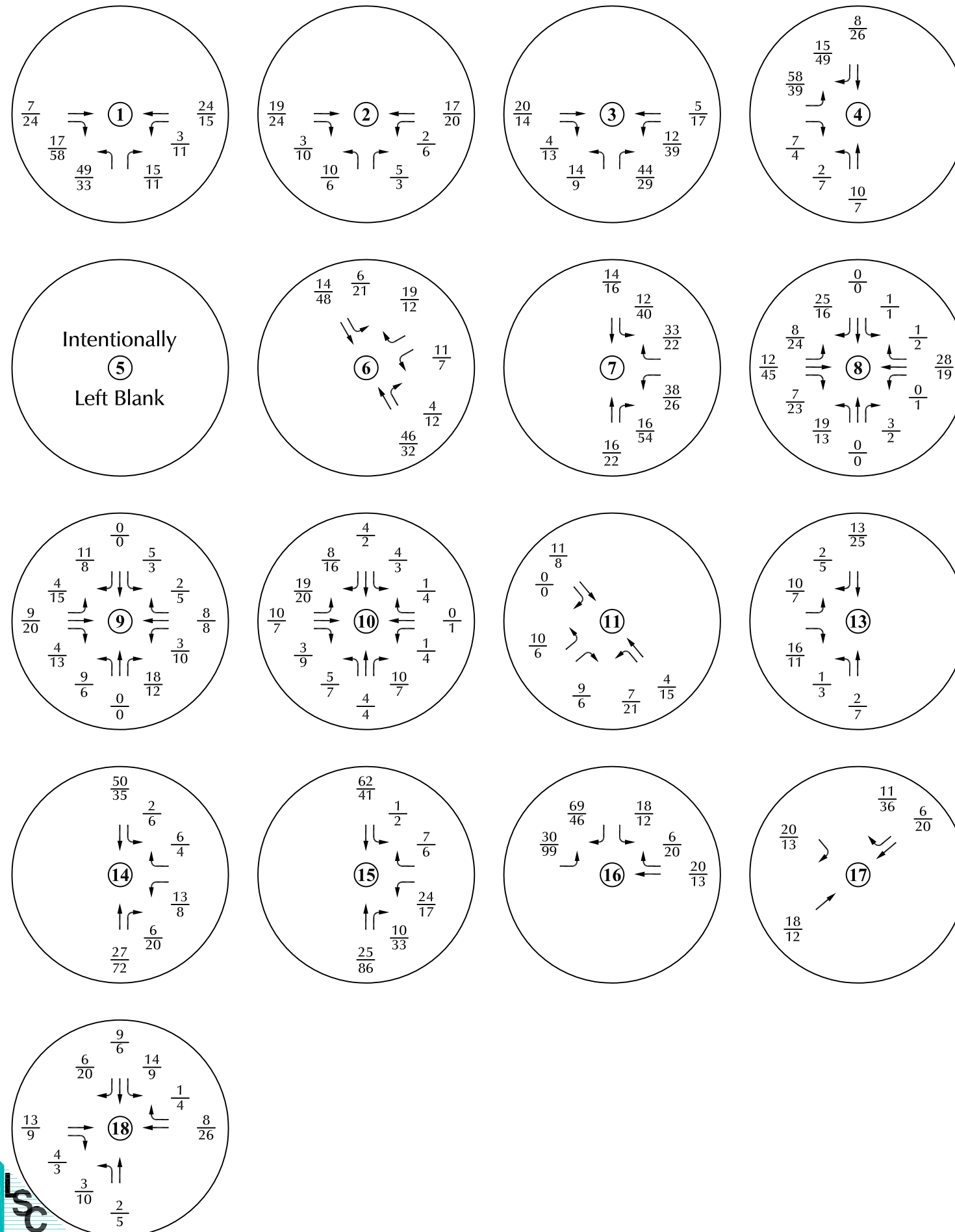
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LEGEND:

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



Note: Assumes no connection east to Monaghan Road by 2024 and buildout of the Harmony development phases to the west based on the Master Harmony TIS by LSC dated March 9, 2017.



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

Approximate Scale
 Scale: 1" = 1,000'

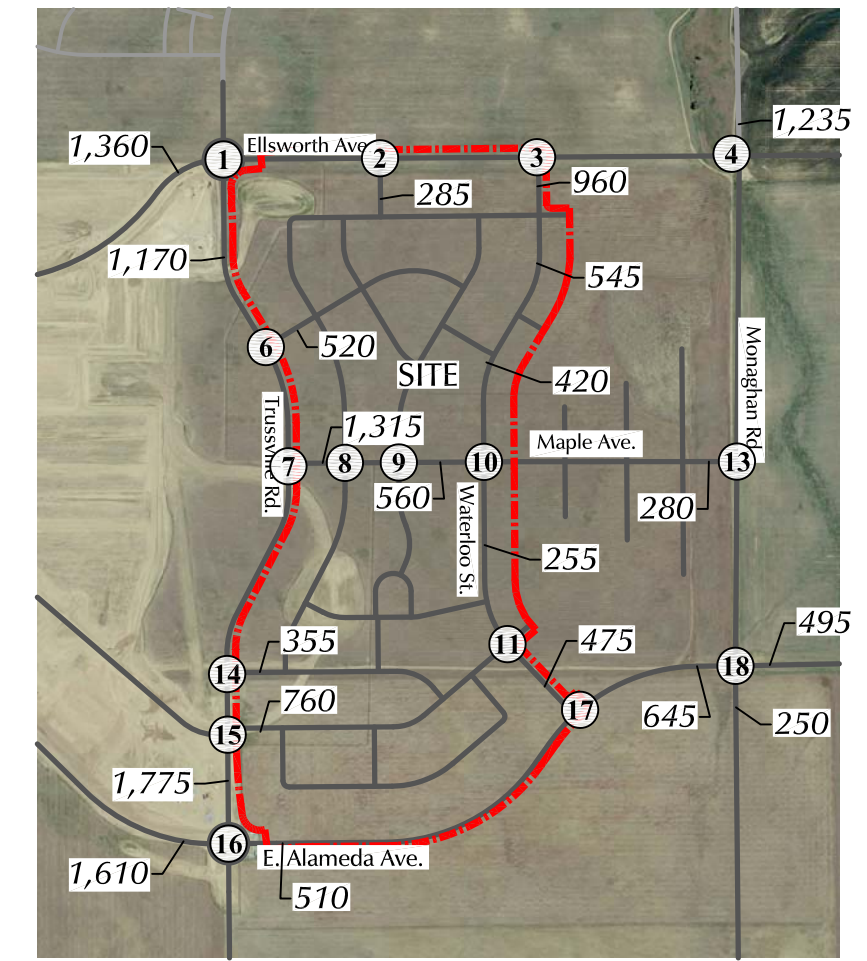
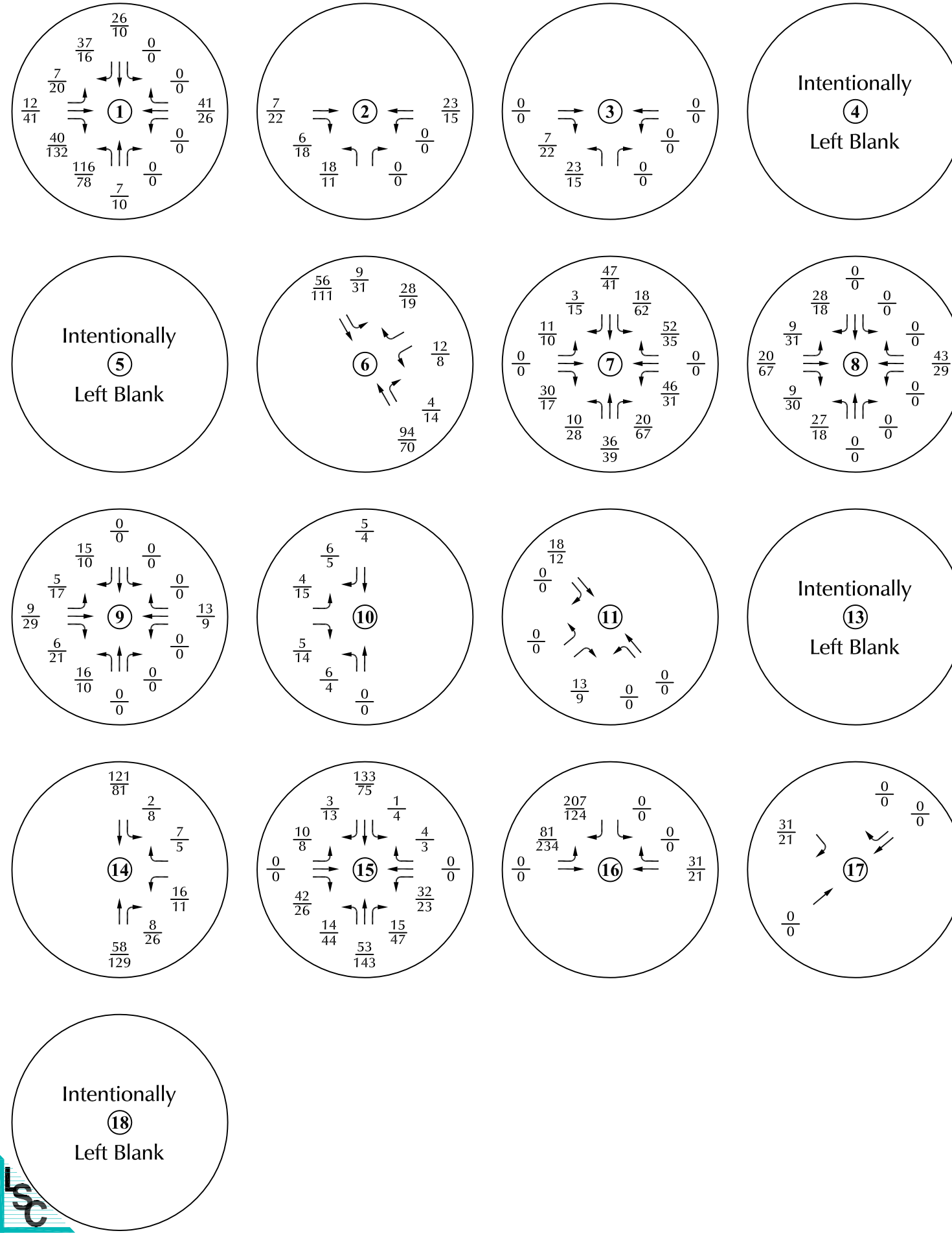


Figure 7
 Year 2040 Assignment
 of Site-Generated Traffic
 Harmony CSP-3 (LSC #190710)



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

Approximate Scale
 Scale: 1" = 1,000'

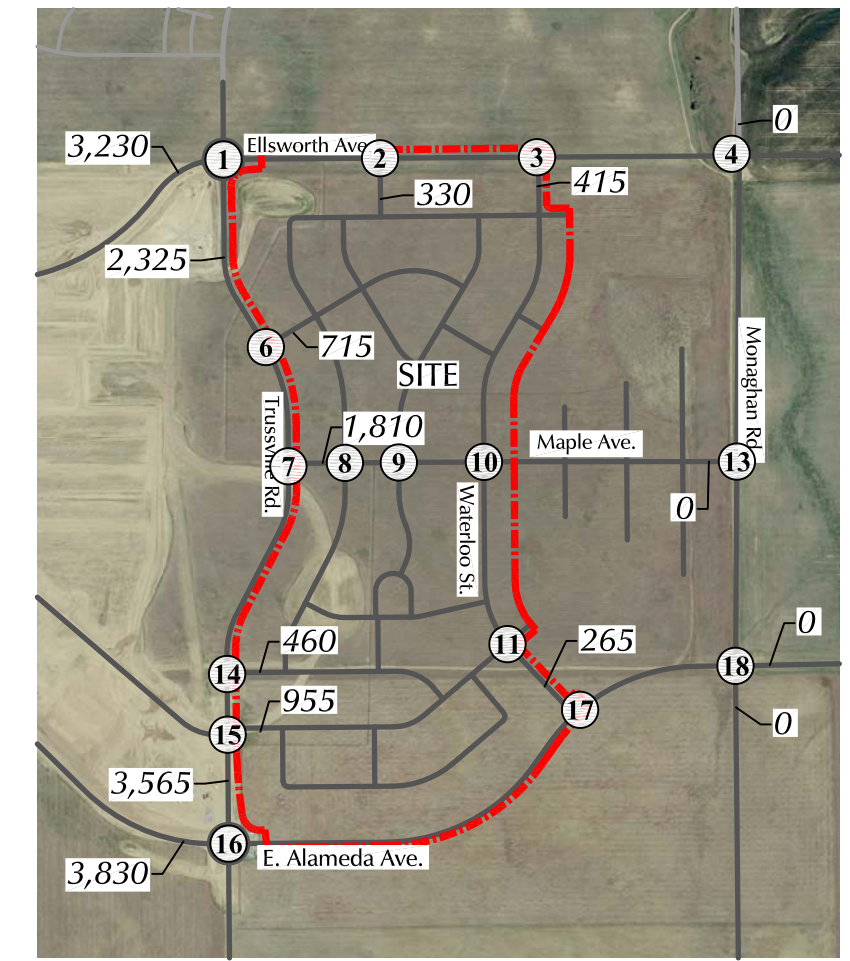
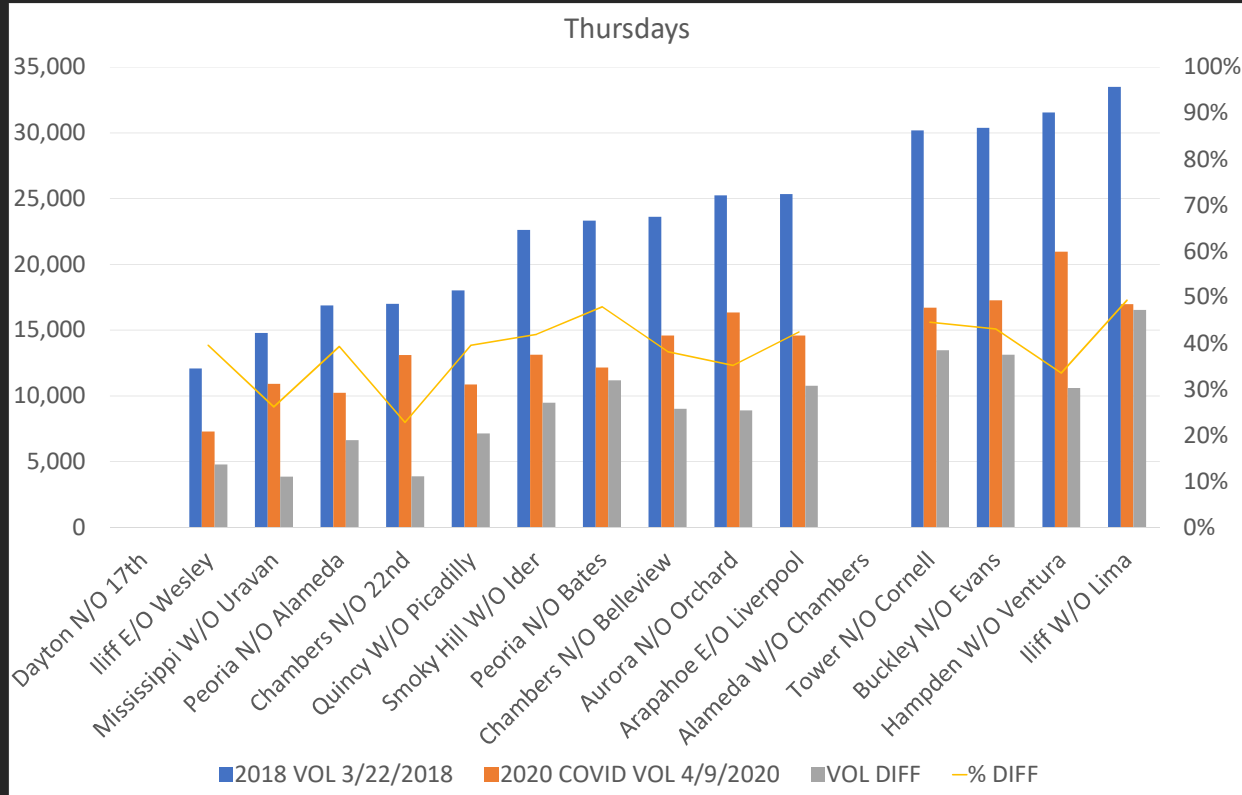
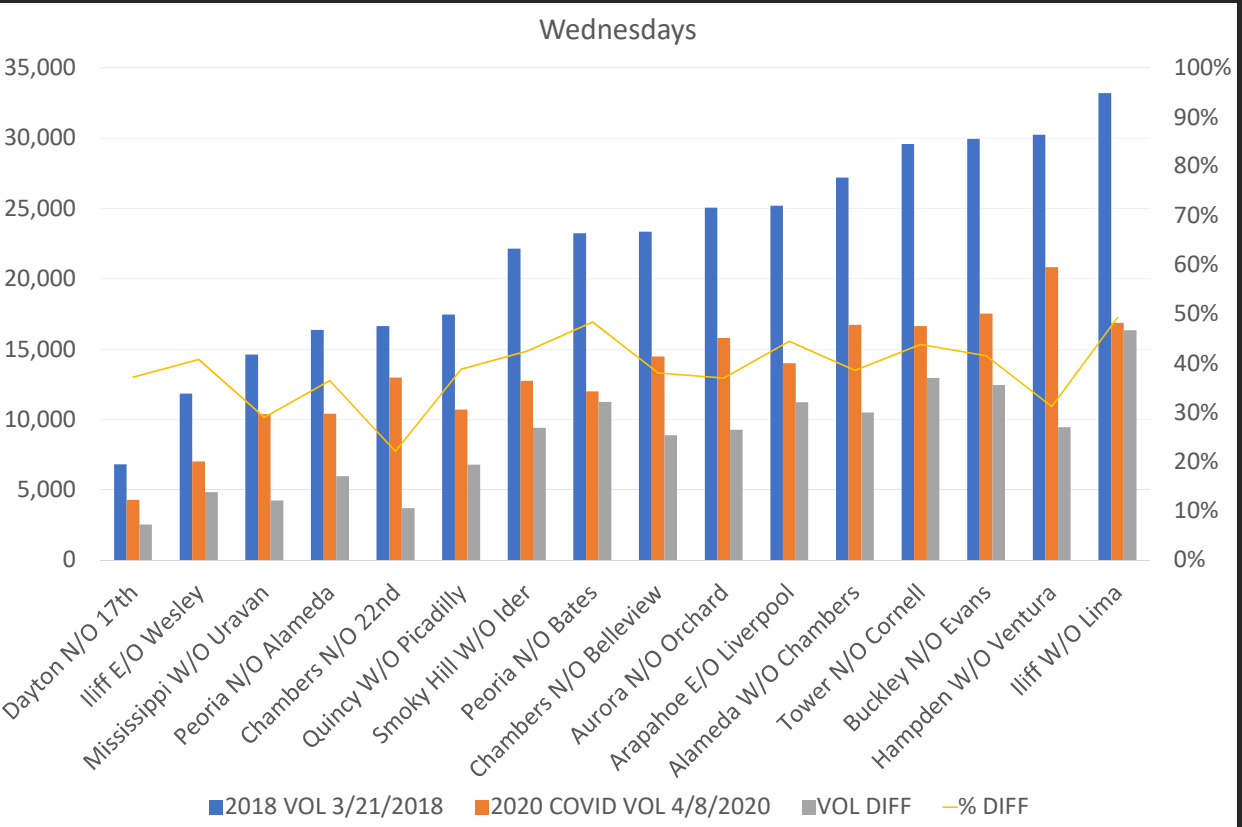


Figure 8a
Year 2024
Total Traffic
 Harmony CSP-3 (LSC #190710)

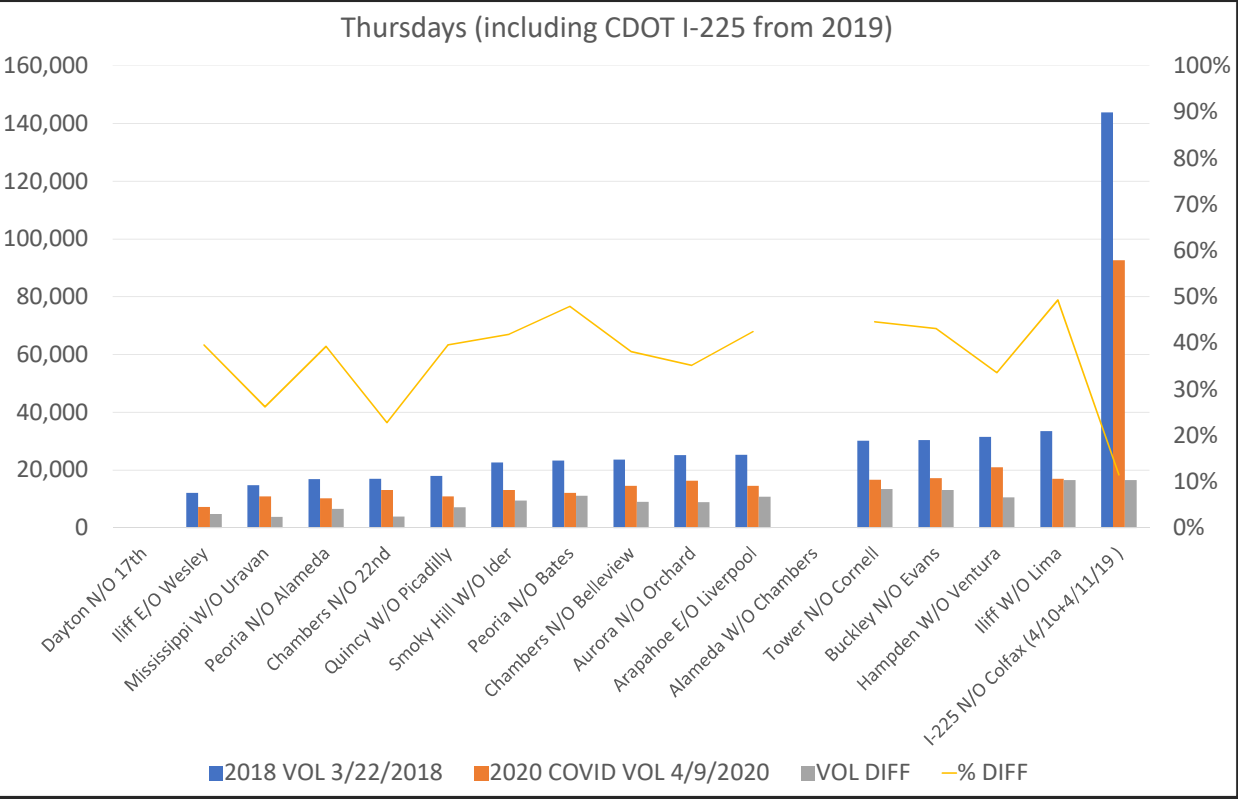
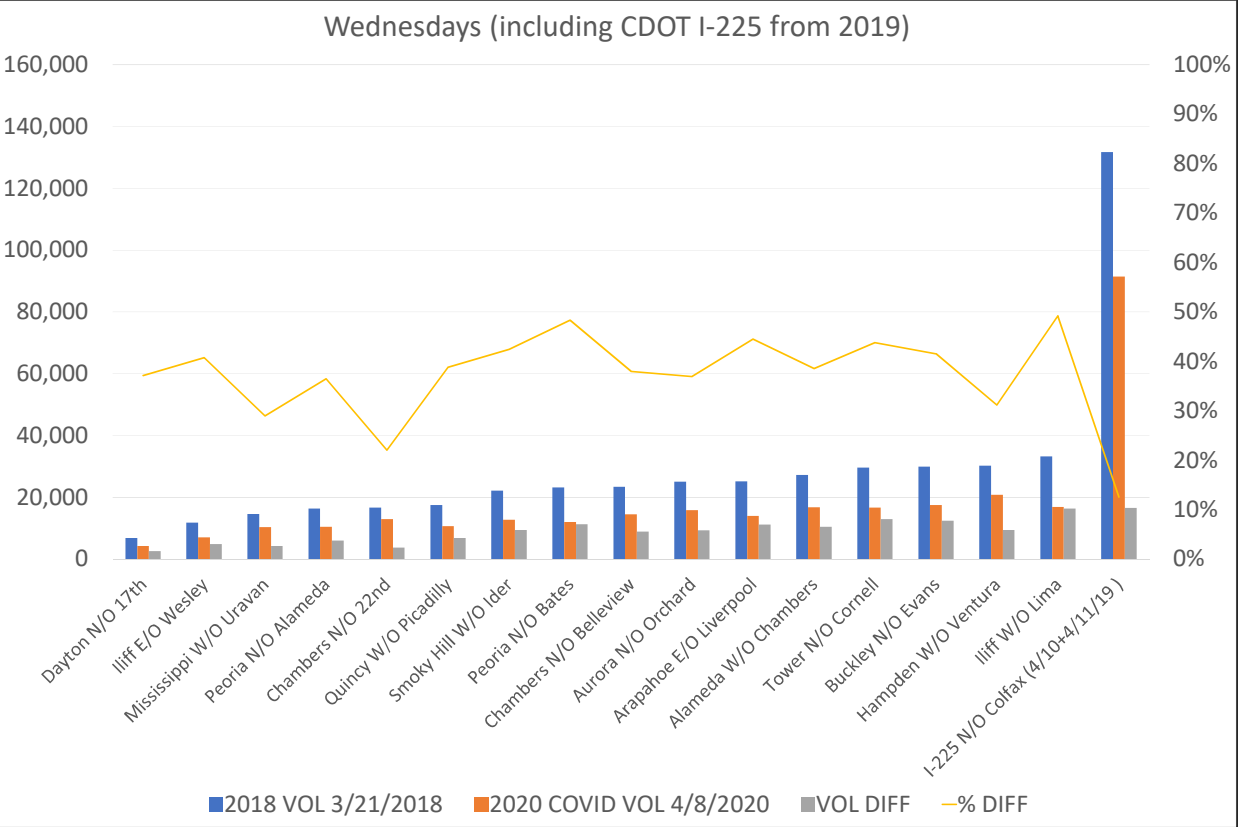
Daily Volume Summary

Location	Wednesday				Thursday			
	2018 VOL 3/21/2018	2020 COVID VOL 4/8/2020	VOL DIFF	% DIFF	2018 VOL 3/22/2018	2020 COVID VOL 4/9/2020	VOL DIFF	% DIFF
Dayton N/O 17th	6,789	4,267	2,522	37%	No Counts			
Iliff E/O Wesley	11,828	7,007	4,821	41%	12,086	7,306	4,780	40%
Mississippi W/O Uravan	14,599	10,367	4,232	29%	14,800	10,926	3,874	26%
Peoria N/O Alameda	16,354	10,389	5,965	36%	16,881	10,246	6,635	39%
Chambers N/O 22nd	16,627	12,955	3,672	22%	16,994	13,111	3,883	23%
Quincy W/O Picadilly	17,451	10,680	6,771	39%	18,031	10,885	7,146	40%
Smoky Hill W/O Ider	22,135	12,739	9,396	42%	22,627	13,133	9,494	42%
Peoria N/O Bates	23,216	11,990	11,226	48%	23,342	12,155	11,187	48%
Chambers N/O Belleview	23,343	14,471	8,872	38%	23,628	14,599	9,029	38%
Aurora N/O Orchard	25,054	15,795	9,259	37%	25,241	16,345	8,896	35%
Arapahoe E/O Liverpool	25,186	13,982	11,204	44%	25,360	14,584	10,776	42%
Alameda W/O Chambers	27,193	16,715	10,478	39%	No Counts			
Tower N/O Cornell	29,571	16,624	12,947	44%	30,192	16,714	13,478	45%
Buckley N/O Evans	29,943	17,513	12,430	42%	30,393	17,265	13,128	43%
Hampden W/O Ventura	30,244	20,812	9,432	31%	31,565	20,958	10,607	34%
Iliff W/O Lima	33,186	16,855	16,331	49%	33,511	16,974	16,537	49%
I-225 N/O Colfax (4/10+4/11/19)	131,684	91,436	16,537	13%	143,817	92,710	16,537	11%
	Average			39%	Average			39%
	Min			22%	Min			23%
	Max			49%	Max			49%



Daily Volume Summary

Location	Wednesday				Thursday			
	2018 VOL 3/21/2018	2020 COVID VOL 4/8/2020	VOL DIFF	% DIFF	2018 VOL 3/22/2018	2020 COVID VOL 4/9/2020	VOL DIFF	% DIFF
Dayton N/O 17th	6,789	4,267	2,522	37%	No Counts			
Iliff E/O Wesley	11,828	7,007	4,821	41%	12,086	7,306	4,780	40%
Mississippi W/O Uravan	14,599	10,367	4,232	29%	14,800	10,926	3,874	26%
Peoria N/O Alameda	16,354	10,389	5,965	36%	16,881	10,246	6,635	39%
Chambers N/O 22nd	16,627	12,955	3,672	22%	16,994	13,111	3,883	23%
Quincy W/O Picadilly	17,451	10,680	6,771	39%	18,031	10,885	7,146	40%
Smoky Hill W/O Ider	22,135	12,739	9,396	42%	22,627	13,133	9,494	42%
Peoria N/O Bates	23,216	11,990	11,226	48%	23,342	12,155	11,187	48%
Chambers N/O Belleview	23,343	14,471	8,872	38%	23,628	14,599	9,029	38%
Aurora N/O Orchard	25,054	15,795	9,259	37%	25,241	16,345	8,896	35%
Arapahoe E/O Liverpool	25,186	13,982	11,204	44%	25,360	14,584	10,776	42%
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I-225 N/O Colfax (4/10+4/11/19)	131,684	91,436	16,537	13%	143,817	92,710	16,537	11%
Average				39%	Average			39%
Min				22%	Min			23%
Max				49%	Max			49%



Waltraud Carter

From: Medema, Brianna <bmedema@auroragov.org>
Sent: Thursday, June 11, 2020 8:11 AM
To: Chris McGranahan
Cc: Anna Sparks; Tess Hogan; Kevin Smith; John Prestwich; Kevin Kraus; Waltraud Carter; Harline, Carl
Subject: RE: JAMASO - raw traffic counts for your review

Chris,

City Traffic Engineering supports the use of adjustment factor proposed. Approval has been given for this 1.40.

Internal to City Traffic Engineering there is some concern that traffic volumes have increased since volumes were taken, and as such the proposed escalation factor may be overly conservative, and if desired your development take counts on some arterials to support a reduction from 1.4 to a smaller adjustment factor. Also of concern is that the reduction in the daily volumes and the peak hour volumes were not reduced by the same amount, and some locations had a greater impact or reduction. The City Traffic management would like to offer the raw data (source information) for the previously provided, if desired to allow for the Traffic Engineering consultant to do a throughout review of raw data and their own analysis (vs the previously provided summary document).

If you have any questions, please let me know.

Thanks,

Brianna S. Medema, P.E.

Project Engineer - Traffic | City of Aurora

office 303.739.7336 | email bmedema@auroragov.org



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Thank you for your message. Because of the ongoing impact of the coronavirus, the city of Aurora is focused on providing essential services to our residents and is restricting the number of employees in the office in order to help stop the spread of COVID-19. At this time, I am working remotely. I can retrieve VM from my desk phone, but ask that you first try to contact me via email. See Aurora's [COVID-19 webpage](#) for up to date information.

From: Chris McGranahan [mailto:csmcgranahan@lsctrans.com]

Sent: Wednesday, June 10, 2020 8:28 AM

To: Medema, Brianna <bmedema@auroragov.org>

Cc: Anna Sparks <anna@innovativelandinc.com>; Tess Hogan <tess@innovativelandinc.com>; Kevin Smith <ksmith@westsideinv.com>; John Prestwich <john@pcsgroupco.com>; Kevin Kraus <kmkraus@lsctrans.com>; Waltraud Carter <lsc@lscdenver.com>; Harline, Carl <charline@auroragov.org>

Subject: RE: JAMASO - raw traffic counts for your review

Brianna,

After reviewing all of the data it feels like an appropriate adjustment factor is about 1.40. A large percentage of the roadway links seem to hover around this level.

Let me know if you concur and we will make the appropriate adjustments to our raw data.

Thank you,

Christopher S. McGranahan, PE, PTOE
Principal

LSC Transportation Consultants, Inc.
1889 York Street
Denver, CO 80206
303-333-1105
csmcgranahan@lsctrans.com
lsctrans.com

From: Medema, Brianna <bmedema@auroragov.org>
Sent: Tuesday, May 26, 2020 1:47 PM
To: Chris McGranahan <csmcgranahan@lsctrans.com>
Cc: Anna Sparks <anna@innovativelandinc.com>; Tess Hogan <tess@innovativelandinc.com>; Kevin Smith <ksmith@westsideinv.com>; John Prestwich <john@pcsgroupco.com>; Kevin Kraus <kmkraus@lsctrans.com>; Waltraud Carter <lsc@lscdenver.com>; Harline, Carl <charline@auroragov.org>
Subject: RE: JAMASO - raw traffic counts for your review

Chris,

Please see the attached summary of data collected by the City in regards to COVID-19's impact on traffic volumes on arterials around the City. Please review and propose an adjustment factor for your collected data based on the most similar segment in the attachment.

Please note that the City assumes a 2% annual escalation unless other DRCOG data can support an alternate number (2018 vs 2020 volumes).

Thanks,
Brianna S. Medema, P.E.
Project Engineer - Traffic | City of Aurora
office 303.739.7336 | email bmedema@auroragov.org



[Facebook](#) | [Twitter](#) | [Instagram](#) | [Nextdoor](#) | [AuroraTV.org](#)

Thank you for your message. Because of the ongoing impact of the coronavirus, the city of Aurora is focused on providing essential services to our residents and is restricting the number of employees in the office in order to help stop the spread of COVID-19. At this time, I am working remotely. I can retrieve VM from my desk phone, but ask that you first try to contact me via email. See Aurora's [COVID-19 webpage](#) for up to date information.

From: Chris McGranahan [<mailto:csmcgranahan@lsctrans.com>]
Sent: Tuesday, May 19, 2020 10:02 AM
To: Medema, Brianna <bmedema@auroragov.org>
Cc: Anna Sparks <anna@innovativelandinc.com>; Tess Hogan <tess@innovativelandinc.com>; Kevin Smith <ksmith@westsideinv.com>; John Prestwich <john@pcsgroupco.com>; Kevin Kraus <kmkraus@lsctrans.com>; Waltraud

Carter <lsc@lscdenver.com>

Subject: JAMASO - raw traffic counts for your review

Brianna,

When we last spoke regarding the JAMASO project you suggested I forward the traffic counts to you so you can make a suggestion of what adjustment, if any, we should assume to account for the safer at home order.

Please find attached the weekday morning and afternoon peak hour traffic counts for E. 6th Avenue/Powhaton Road and the daily counts for the three approaches.

Thank you,

Christopher S. McGranahan, PE, PTOE

Principal

LSC Transportation Consultants, Inc.

1889 York Street

Denver, CO 80206

303-333-1105

csmcgranahan@lsctrans.com

lsctrans.com

Location: POWHATON ROAD N/O 6TH AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200206
Station ID: 200206

Start Time	03-Nov-20 Tue	NORTHBOU	SOUTHBOU							Total
12:00 AM		7	23							30
01:00		7	13							20
02:00		16	11							27
03:00		29	17							46
04:00		55	26							81
05:00		144	44							188
06:00		184	183							367
07:00		230	245							475
08:00		139	176							315
09:00		118	138							256
10:00		155	142							297
11:00		163	146							309
12:00 PM		176	162							338
01:00		167	172							339
02:00		200	200							400
03:00		246	249							495
04:00		209	266							475
05:00		246	259							505
06:00		129	124							253
07:00		71	90							161
08:00		54	68							122
09:00		40	67							107
10:00		25	52							77
11:00		16	51							67
Total		2826	2924							5750
Percent		49.1%	50.9%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	230	245	-	-	-	-	-	-	475
PM Peak	-	15:00	16:00	-	-	-	-	-	-	17:00
Vol.	-	246	266	-	-	-	-	-	-	505

Location: POWHATON ROAD N/O 6TH AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200206
Station ID: 200206

Start Time	04-Nov-20 Wed	NORTHBOU	SOUTHBOU							Total
12:00 AM		4	23							27
01:00		10	11							21
02:00		12	8							20
03:00		25	8							33
04:00		60	32							92
05:00		160	43							203
06:00		170	177							347
07:00		236	277							513
08:00		172	176							348
09:00		136	141							277
10:00		158	146							304
11:00		157	163							320
12:00 PM		162	146							308
01:00		178	183							361
02:00		171	207							378
03:00		225	256							481
04:00		444	31							475
05:00		482	0							482
06:00		294	0							294
07:00		138	0							138
08:00		128	0							128
09:00		109	0							109
10:00		65	0							65
11:00		71	0							71
Total		3767	2028							5795
Percent		65.0%	35.0%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	236	277	-	-	-	-	-	-	513
PM Peak	-	17:00	15:00	-	-	-	-	-	-	17:00
Vol.	-	482	256	-	-	-	-	-	-	482

Location: POWHATON ROAD N/O 6TH AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200206
Station ID: 200206

Start Time	05-Nov-20	NORTHBOU	SOUTHBOU								Total
12:00 AM		23	0								23
01:00		19	0								19
02:00		31	0								31
03:00		40	0								40
04:00		76	0								76
05:00		190	0								190
06:00		341	0								341
07:00		462	0								462
08:00		300	0								300
09:00		267	0								267
10:00		309	0								309
11:00		280	0								280
12:00 PM		310	0								310
01:00		327	0								327
02:00		351	0								351
03:00		435	0								435
04:00		482	0								482
05:00		458	0								458
06:00		317	0								317
07:00		180	0								180
08:00		133	0								133
09:00		109	0								109
10:00		70	0								70
11:00		73	0								73
Total		5583	0								5583
Percent		100.0%	0.0%								
AM Peak	-	07:00	-	-	-	-	-	-	-	07:00	
Vol.	-	462	-	-	-	-	-	-	-	462	
PM Peak	-	16:00	-	-	-	-	-	-	-	16:00	
Vol.	-	482	-	-	-	-	-	-	-	482	
Grand Total		12176	4952								17128
Percent		71.1%	28.9%								
ADT		ADT 5,709	AADT 5,709								

Location: POWHATON ROAD S/O 6TH AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200207
Station ID: 200207

Start Time	03-Nov-20 Tue	NORTHBOU	SOUTHBOU							Total
12:00 AM		5	16							21
01:00		4	7							11
02:00		12	5							17
03:00		14	8							22
04:00		38	15							53
05:00		97	28							125
06:00		113	123							236
07:00		166	220							386
08:00		98	141							239
09:00		88	109							197
10:00		93	115							208
11:00		120	111							231
12:00 PM		130	137							267
01:00		115	135							250
02:00		161	178							339
03:00		183	195							378
04:00		151	180							331
05:00		170	180							350
06:00		94	84							178
07:00		38	62							100
08:00		31	43							74
09:00		26	46							72
10:00		11	36							47
11:00		12	35							47
Total		1970	2209							4179
Percent		47.1%	52.9%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	166	220	-	-	-	-	-	-	386
PM Peak	-	15:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	183	195	-	-	-	-	-	-	378

Location: POWHATON ROAD S/O 6TH AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200207
Station ID: 200207

Start Time	04-Nov-20 Wed	NORTHBOU	SOUTHBOU							Total
12:00 AM		5	16							21
01:00		6	5							11
02:00		9	5							14
03:00		11	3							14
04:00		42	11							53
05:00		107	37							144
06:00		121	126							247
07:00		163	247							410
08:00		115	164							279
09:00		103	110							213
10:00		110	120							230
11:00		122	134							256
12:00 PM		133	124							257
01:00		138	146							284
02:00		130	164							294
03:00		168	194							362
04:00		23	22							45
05:00		0	0							0
06:00		0	0							0
07:00		0	0							0
08:00		0	0							0
09:00		0	0							0
10:00		0	0							0
11:00		0	0							0
Total		1506	1628							3134
Percent		48.1%	51.9%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	163	247	-	-	-	-	-	-	410
PM Peak	-	15:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	168	194	-	-	-	-	-	-	362

Location: POWHATON ROAD S/O 6TH AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200207
Station ID: 200207

Start Time	05-Nov-20 Thu	NORTHBOU	SOUTHBOU								Total
12:00 AM		0	0								0
01:00		0	0								0
02:00		0	0								0
03:00		0	0								0
04:00		0	0								0
05:00		0	0								0
06:00		0	0								0
07:00		0	0								0
08:00		0	0								0
09:00		0	0								0
10:00		0	0								0
11:00		0	0								0
12:00 PM		0	0								0
01:00		0	0								0
02:00		0	0								0
03:00		0	0								0
04:00		0	0								0
05:00		0	0								0
06:00		0	0								0
07:00		0	0								0
08:00		0	0								0
09:00		0	0								0
10:00		0	0								0
11:00		0	0								0
Total		0	0								0
Percent		0.0%	0.0%								
AM Peak	-	-	-	-	-	-	-	-	-	-	-
Vol.	-	-	-	-	-	-	-	-	-	-	-
PM Peak	-	-	-	-	-	-	-	-	-	-	-
Vol.	-	-	-	-	-	-	-	-	-	-	-
Grand Total		3476	3837								7313
Percent		47.5%	52.5%								
ADT		ADT 2,438	AADT 2,438								

Location: POWHATON ROAD S/O ALAMEDA AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200203
Station ID: 200203

Start Time	03-Nov-20 Tue	NORTHBOU	SOUTHBOU							Total
12:00 AM		3	11							14
01:00		4	4							8
02:00		6	3							9
03:00		5	9							14
04:00		22	19							41
05:00		51	35							86
06:00		87	100							187
07:00		106	125							231
08:00		66	125							191
09:00		61	84							145
10:00		61	96							157
11:00		78	101							179
12:00 PM		80	106							186
01:00		96	101							197
02:00		95	121							216
03:00		121	185							306
04:00		120	132							252
05:00		128	126							254
06:00		90	43							133
07:00		38	25							63
08:00		22	22							44
09:00		23	23							46
10:00		7	29							36
11:00		8	26							34
Total		1378	1651							3029
Percent		45.5%	54.5%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	106	125	-	-	-	-	-	-	231
PM Peak	-	17:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	128	185	-	-	-	-	-	-	306

Location: POWHATON ROAD S/O ALAMEDA AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200203
Station ID: 200203

Start Time	04-Nov-20	NORTHBOU	SOUTHBOU							Total
12:00 AM	Wed	2	13							15
01:00		4	4							8
02:00		6	4							10
03:00		5	3							8
04:00		22	14							36
05:00		62	30							92
06:00		79	93							172
07:00		114	149							263
08:00		85	124							209
09:00		53	99							152
10:00		84	105							189
11:00		83	105							188
12:00 PM		108	104							212
01:00		95	119							214
02:00		93	138							231
03:00		105	185							290
04:00		118	148							266
05:00		114	124							238
06:00		81	64							145
07:00		46	33							79
08:00		27	25							52
09:00		24	24							48
10:00		10	11							21
11:00		12	33							45
Total		1432	1751							3183
Percent		45.0%	55.0%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	114	149	-	-	-	-	-	-	263
PM Peak	-	16:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	118	185	-	-	-	-	-	-	290

Site Code: 200203
Station ID: 200203

Start Time	05-Nov-20 Thu	NORTHBOU	SOUTHBOU	Total
12:00 AM		1	10	11
01:00		5	3	8
02:00		6	4	10
03:00		4	4	8
04:00		24	15	39
05:00		56	32	88
06:00		74	88	162
07:00		114	145	259
08:00		72	112	184
09:00		78	112	190
10:00		83	101	184
11:00		69	115	184
12:00 PM		111	109	220
01:00		109	110	219
02:00		81	145	226
03:00		119	177	296
04:00		125	157	282
05:00		121	114	235
06:00		76	65	141
07:00		55	40	95
08:00		27	25	52
09:00		23	31	54
10:00		8	15	23
11:00		12	32	44
Total		1453	1761	3214
Percent		45.2%	54.8%	
AM Peak Vol.	-	07:00 114	07:00 145	07:00 259
PM Peak Vol.	-	16:00 125	15:00 177	15:00 296
Grand Total		4263	5163	9426
Percent		45.2%	54.8%	
ADT		ADT 3,142	AADT 3,142	

Location: 6TH AVENUE W/O POWATON ROAD
City: AURORA
County: ADAMS
Direction: EAST/WEST

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

Site Code: 200216
Station ID: 200216

Start Time	03-Nov-20 Tue	EASTBOUN	WESTBOUN							Total
12:00 AM		6	10							16
01:00		3	6							9
02:00		4	6							10
03:00		15	7							22
04:00		19	15							34
05:00		56	25							81
06:00		87	76							163
07:00		128	96							224
08:00		73	69							142
09:00		68	63							131
10:00		95	63							158
11:00		80	79							159
12:00 PM		96	82							178
01:00		81	64							145
02:00		110	94							204
03:00		119	122							241
04:00		114	135							249
05:00		120	136							256
06:00		66	67							133
07:00		49	45							94
08:00		30	28							58
09:00		21	30							51
10:00		17	19							36
11:00		9	21							30
Total		1466	1358							2824
Percent		51.9%	48.1%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	128	96	-	-	-	-	-	-	224
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	120	136	-	-	-	-	-	-	256

Location: 6TH AVENUE W/O POWATON ROAD
City: AURORA
County: ADAMS
Direction: EAST/WEST

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

Site Code: 200216
Station ID: 200216

Start Time	04-Nov-20 Wed	EASTBOUN	WESTBOUN							Total
12:00 AM		0	8							8
01:00		6	7							13
02:00		6	4							10
03:00		14	5							19
04:00		21	22							43
05:00		66	25							91
06:00		82	83							165
07:00		135	92							227
08:00		92	54							146
09:00		64	57							121
10:00		79	71							150
11:00		70	63							133
12:00 PM		59	64							123
01:00		79	81							160
02:00		86	90							176
03:00		106	107							213
04:00		128	130							258
05:00		122	143							265
06:00		93	76							169
07:00		36	32							68
08:00		40	35							75
09:00		25	33							58
10:00		12	20							32
11:00		8	24							32
Total		1429	1326							2755
Percent		51.9%	48.1%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	135	92	-	-	-	-	-	-	227
PM Peak	-	16:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	128	143	-	-	-	-	-	-	265

Location: 6TH AVENUE W/O POWATON ROAD
City: AURORA
County: ADAMS
Direction: EAST/WEST

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

Site Code: 200216
Station ID: 200216

Start Time	05-Nov-20 Thu	EASTBOUN	WESTBOUN							Total
12:00 AM		2	5							7
01:00		5	5							10
02:00		7	6							13
03:00		15	7							22
04:00		21	16							37
05:00		66	21							87
06:00		99	70							169
07:00		113	91							204
08:00		78	49							127
09:00		78	60							138
10:00		80	57							137
11:00		81	71							152
12:00 PM		75	83							158
01:00		94	85							179
02:00		77	80							157
03:00		110	102							212
04:00		131	120							251
05:00		113	127							240
06:00		82	95							177
07:00		38	53							91
08:00		40	37							77
09:00		22	31							53
10:00		15	22							37
11:00		10	17							27
Total		1452	1310							2762
Percent		52.6%	47.4%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	113	91	-	-	-	-	-	-	204
PM Peak	-	16:00	17:00	-	-	-	-	-	-	16:00
Vol.	-	131	127	-	-	-	-	-	-	251
Grand Total		4347	3994							8341
Percent		52.1%	47.9%							
ADT		ADT 2,780	AADT 2,780							

Location: ALAMEDA AVENUE E/O POWHATON ROAD
City: AURORA
County: ADAMS
Direction: EAST/WEST

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

Site Code: 20020
Station ID: 20020

Start Time	03-Nov-20 Tue	EASTBOUN	WESTBOUN							Total
12:00 AM		0	0							0
01:00		0	0							0
02:00		0	0							0
03:00		0	0							0
04:00		0	2							2
05:00		0	1							1
06:00		7	4							11
07:00		11	4							15
08:00		10	7							17
09:00		8	15							23
10:00		10	8							18
11:00		11	11							22
12:00 PM		6	11							17
01:00		10	14							24
02:00		7	10							17
03:00		20	16							36
04:00		15	14							29
05:00		9	12							21
06:00		3	10							13
07:00		1	0							1
08:00		0	0							0
09:00		1	1							2
10:00		0	1							1
11:00		1	0							1
Total		130	141							271
Percent		48.0%	52.0%							
AM Peak	-	07:00	09:00	-	-	-	-	-	-	09:00
Vol.	-	11	15	-	-	-	-	-	-	23
PM Peak	-	15:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	20	16	-	-	-	-	-	-	36

Location: ALAMEDA AVENUE E/O POWHATON ROAD
City: AURORA
County: ADAMS
Direction: EAST/WEST

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

Site Code: 20020
Station ID: 20020

Start Time	04-Nov-20 Wed	EASTBOUN	WESTBOUN							Total
12:00 AM		0	0							0
01:00		0	0							0
02:00		0	0							0
03:00		0	0							0
04:00		0	2							2
05:00		11	4							15
06:00		7	4							11
07:00		13	8							21
08:00		17	15							32
09:00		9	8							17
10:00		7	7							14
11:00		9	9							18
12:00 PM		13	8							21
01:00		9	10							19
02:00		15	7							22
03:00		17	19							36
04:00		17	8							25
05:00		9	15							24
06:00		8	3							11
07:00		2	3							5
08:00		2	2							4
09:00		0	3							3
10:00		2	0							2
11:00		3	2							5
Total		170	137							307
Percent		55.4%	44.6%							
AM Peak	-	08:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	17	15	-	-	-	-	-	-	32
PM Peak	-	15:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	17	19	-	-	-	-	-	-	36

Site Code: 20020
Station ID: 20020

Start Time	05-Nov-20 Thu	EASTBOUN	WESTBOUN	Total
12:00 AM		1	0	1
01:00		0	0	0
02:00		1	1	2
03:00		0	0	0
04:00		0	0	0
05:00		1	2	3
06:00		7	2	9
07:00		11	9	20
08:00		9	8	17
09:00		12	10	22
10:00		14	6	20
11:00		8	6	14
12:00 PM		13	11	24
01:00		8	8	16
02:00		6	12	18
03:00		14	10	24
04:00		3	14	17
05:00		13	11	24
06:00		2	2	4
07:00		3	3	6
08:00		3	1	4
09:00		2	2	4
10:00		0	0	0
11:00		3	0	3
Total		134	118	252
Percent		53.2%	46.8%	
AM Peak Vol.	-	10:00 14	09:00 10	- - - - - 09:00 22
PM Peak Vol.	-	15:00 14	16:00 14	- - - - - 12:00 24
Grand Total		434	396	830
Percent		52.3%	47.7%	
ADT		ADT 277	AADT 277	

Location: POWHATON ROAD N/O ALAMEDA AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200213
Station ID: 200213

Start Time	03-Nov-20 Tue	NORTHBOU	SOUTHBOU							Total
12:00 AM		3	11							14
01:00		4	4							8
02:00		6	3							9
03:00		5	10							15
04:00		22	16							38
05:00		51	34							85
06:00		87	99							186
07:00		101	125							226
08:00		64	114							178
09:00		62	68							130
10:00		57	88							145
11:00		68	99							167
12:00 PM		76	96							172
01:00		97	96							193
02:00		92	122							214
03:00		114	179							293
04:00		110	126							236
05:00		128	122							250
06:00		93	35							128
07:00		38	26							64
08:00		23	22							45
09:00		22	22							44
10:00		6	29							35
11:00		7	25							32
Total		1336	1571							2907
Percent		46.0%	54.0%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	101	125	-	-	-	-	-	-	226
PM Peak	-	17:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	128	179	-	-	-	-	-	-	293

Location: POWHATON ROAD N/O ALAMEDA AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200213
Station ID: 200213

Start Time	04-Nov-20 Wed	NORTHBOU	SOUTHBOU							Total
12:00 AM		2	13							15
01:00		4	4							8
02:00		6	4							10
03:00		5	3							8
04:00		22	13							35
05:00		64	37							101
06:00		73	90							163
07:00		106	137							243
08:00		81	111							192
09:00		48	90							138
10:00		73	95							168
11:00		73	92							165
12:00 PM		98	99							197
01:00		91	106							197
02:00		82	126							208
03:00		104	175							279
04:00		104	154							258
05:00		111	115							226
06:00		79	66							145
07:00		51	35							86
08:00		29	25							54
09:00		24	21							45
10:00		10	14							24
11:00		8	30							38
Total		1348	1655							3003
Percent		44.9%	55.1%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	106	137	-	-	-	-	-	-	243
PM Peak	-	17:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	111	175	-	-	-	-	-	-	279

Location: POWHATON ROAD N/O ALAMEDA AVENUE
City: AURORA
County: ADAMS
Direction: NORTH/SOUTH

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

Site Code: 200213
Station ID: 200213

Start Time	05-Nov-20 Thu	NORTHBOU	SOUTHBOU							Total
12:00 AM		1	11							12
01:00		6	3							9
02:00		5	3							8
03:00		4	4							8
04:00		24	16							40
05:00		56	32							88
06:00		72	95							167
07:00		107	131							238
08:00		67	94							161
09:00		78	99							177
10:00		76	92							168
11:00		68	104							172
12:00 PM		98	97							195
01:00		103	112							215
02:00		69	125							194
03:00		113	172							285
04:00		125	146							271
05:00		115	120							235
06:00		73	65							138
07:00		54	37							91
08:00		25	26							51
09:00		22	31							53
10:00		8	16							24
11:00		11	33							44
Total		1380	1664							3044
Percent		45.3%	54.7%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	107	131	-	-	-	-	-	-	238
PM Peak	-	16:00	15:00	-	-	-	-	-	-	15:00
Vol.	-	125	172	-	-	-	-	-	-	285
Grand Total		4064	4890							8954
Percent		45.4%	54.6%							
ADT		ADT 1,632	AADT 1,632							

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

Location: EAST 6TH AVE W/O POWHATIN RD
City: AURORA
County: ARAPAHOE
Direction: EASTBOUND

Site Code: 201216
Station ID: 201216

Start Time	11-May-20		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EASTBOU	WESTB	EASTBO	WESTB	EASTBO	WESTB	EASTBO	WESTB	EASTBO	WESTB	EASTBO	WESTB	EASTBO	WESTB	EASTBO	WESTB
12:00 AM	*	*	*	*	2	6	1	3	*	*	*	*	*	*	2	4
01:00	*	*	*	*	2	0	3	0	*	*	*	*	*	*	2	0
02:00	*	*	*	*	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	*	*	1	1	2	0	*	*	*	*	*	*	2	0
04:00	*	*	*	*	3	2	1	2	*	*	*	*	*	*	2	2
05:00	*	*	*	*	16	4	20	6	*	*	*	*	*	*	18	5
06:00	*	*	*	*	39	11	46	11	*	*	*	*	*	*	42	11
07:00	*	*	*	*	51	16	43	22	*	*	*	*	*	*	47	19
08:00	*	*	*	*	53	20	23	11	*	*	*	*	*	*	38	16
09:00	*	*	*	*	26	26	36	11	*	*	*	*	*	*	31	18
10:00	*	*	*	*	34	25	40	22	*	*	*	*	*	*	37	24
11:00	*	*	*	*	36	32	42	34	*	*	*	*	*	*	39	33
12:00 PM	*	*	*	*	51	26	53	35	*	*	*	*	*	*	52	30
01:00	*	*	*	*	50	25	39	50	*	*	*	*	*	*	44	38
02:00	*	*	*	*	46	41	28	30	*	*	*	*	*	*	37	36
03:00	*	*	*	*	49	25	37	30	*	*	*	*	*	*	43	28
04:00	*	*	*	*	49	40	25	27	*	*	*	*	*	*	37	34
05:00	*	*	*	*	49	42	36	27	*	*	*	*	*	*	42	34
06:00	*	*	*	*	32	32	30	28	*	*	*	*	*	*	31	30
07:00	*	*	*	*	27	12	25	20	*	*	*	*	*	*	26	16
08:00	*	*	*	*	26	16	19	15	*	*	*	*	*	*	22	16
09:00	*	*	*	*	14	9	8	6	*	*	*	*	*	*	11	8
10:00	*	*	*	*	5	7	9	7	*	*	*	*	*	*	7	7
11:00	*	*	*	*	3	3	3	0	*	*	*	*	*	*	3	2
Lane	0	0	0	0	664	421	569	397	0	0	0	0	0	0	615	411
Day	0		0		1085		966		0		0		0		1026	
AM Peak	-	-	-	-	08:00	11:00	06:00	11:00	-	-	-	-	-	-	07:00	11:00
Vol.	-	-	-	-	53	32	46	34	-	-	-	-	-	-	47	33
PM Peak	-	-	-	-	12:00	17:00	12:00	13:00	-	-	-	-	-	-	12:00	13:00
Vol.	-	-	-	-	51	42	53	50	-	-	-	-	-	-	52	38

Comb. Total	0	0	1085	966	0	0	0	1026
ADT	ADT 1,026	AADT 1,026						

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

Location: POWHATIN RD N/O E 6TH AVE
City: AURORA
County: ARAPAHOE
Direction: NORTHBOUND

Site Code: 201220
Station ID: 201220

Start Time	11-May-20		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	NORTHBO	SOUTHBO	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB
12:00 AM	*	*	*	*	7	16	2	14	*	*	*	*	*	*	4	15
01:00	*	*	*	*	5	1	5	3	*	*	*	*	*	*	5	2
02:00	*	*	*	*	3	0	7	5	*	*	*	*	*	*	5	2
03:00	*	*	*	*	4	3	3	2	*	*	*	*	*	*	4	2
04:00	*	*	*	*	20	15	19	11	*	*	*	*	*	*	20	13
05:00	*	*	*	*	45	51	51	49	*	*	*	*	*	*	48	50
06:00	*	*	*	*	73	115	65	110	*	*	*	*	*	*	69	112
07:00	*	*	*	*	75	97	70	107	*	*	*	*	*	*	72	102
08:00	*	*	*	*	60	94	44	65	*	*	*	*	*	*	52	80
09:00	*	*	*	*	69	92	72	72	*	*	*	*	*	*	70	82
10:00	*	*	*	*	76	78	71	67	*	*	*	*	*	*	74	72
11:00	*	*	*	*	73	75	77	80	*	*	*	*	*	*	75	78
12:00 PM	*	*	*	*	91	65	101	84	*	*	*	*	*	*	96	74
01:00	*	*	*	*	93	100	107	77	*	*	*	*	*	*	100	88
02:00	*	*	*	*	103	88	116	98	*	*	*	*	*	*	110	93
03:00	*	*	*	*	129	78	119	101	*	*	*	*	*	*	124	90
04:00	*	*	*	*	104	95	83	102	*	*	*	*	*	*	94	98
05:00	*	*	*	*	123	94	108	105	*	*	*	*	*	*	116	100
06:00	*	*	*	*	88	65	85	62	*	*	*	*	*	*	86	64
07:00	*	*	*	*	55	43	54	45	*	*	*	*	*	*	54	44
08:00	*	*	*	*	43	36	35	39	*	*	*	*	*	*	39	38
09:00	*	*	*	*	23	33	21	27	*	*	*	*	*	*	22	30
10:00	*	*	*	*	8	20	15	24	*	*	*	*	*	*	12	22
11:00	*	*	*	*	11	10	13	7	*	*	*	*	*	*	12	8
Lane	0	0	0	0	1381	1364	1343	1356	0	0	0	0	0	0	1363	1359
Day	0		0		2745		2699		0		0		0		2722	
AM Peak	-	-	-	-	10:00	06:00	11:00	06:00	-	-	-	-	-	-	11:00	06:00
Vol.	-	-	-	-	76	115	77	110	-	-	-	-	-	-	75	112
PM Peak	-	-	-	-	15:00	13:00	15:00	17:00	-	-	-	-	-	-	15:00	17:00
Vol.	-	-	-	-	129	100	119	105	-	-	-	-	-	-	124	100

Comb. Total	0	0	2745	2699	0	0	0	2722
ADT	ADT 2,722	AADT 2,722						

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

Location: POWHATIN RD S/O E 6TH AVE
City: AURORA
County: ARAPAHOE
Direction: NORTHBOUND

Site Code: 201219
Station ID: 201219

Start Time	11-May-20		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	NORTHBO	SOUTHBO	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB	NORTHB	SOUTHB
12:00 AM	*	*	*	*	5	10	1	11	*	*	*	*	*	*	3	10
01:00	*	*	*	*	4	2	4	5	*	*	*	*	*	*	4	4
02:00	*	*	*	*	3	0	7	5	*	*	*	*	*	*	5	2
03:00	*	*	*	*	3	2	1	2	*	*	*	*	*	*	2	2
04:00	*	*	*	*	21	16	20	11	*	*	*	*	*	*	20	14
05:00	*	*	*	*	39	56	50	52	*	*	*	*	*	*	44	54
06:00	*	*	*	*	66	130	54	131	*	*	*	*	*	*	60	130
07:00	*	*	*	*	65	118	65	122	*	*	*	*	*	*	65	120
08:00	*	*	*	*	51	114	51	78	*	*	*	*	*	*	51	96
09:00	*	*	*	*	77	90	69	88	*	*	*	*	*	*	73	89
10:00	*	*	*	*	82	89	72	80	*	*	*	*	*	*	77	84
11:00	*	*	*	*	87	84	86	86	*	*	*	*	*	*	86	85
12:00 PM	*	*	*	*	92	76	104	92	*	*	*	*	*	*	98	84
01:00	*	*	*	*	90	109	118	68	*	*	*	*	*	*	104	88
02:00	*	*	*	*	124	96	126	98	*	*	*	*	*	*	125	97
03:00	*	*	*	*	139	74	122	94	*	*	*	*	*	*	130	84
04:00	*	*	*	*	98	88	82	93	*	*	*	*	*	*	90	90
05:00	*	*	*	*	126	83	95	92	*	*	*	*	*	*	110	88
06:00	*	*	*	*	85	50	79	49	*	*	*	*	*	*	82	50
07:00	*	*	*	*	49	38	59	42	*	*	*	*	*	*	54	40
08:00	*	*	*	*	32	33	28	32	*	*	*	*	*	*	30	32
09:00	*	*	*	*	19	29	17	23	*	*	*	*	*	*	18	26
10:00	*	*	*	*	5	14	9	20	*	*	*	*	*	*	7	17
11:00	*	*	*	*	11	8	10	7	*	*	*	*	*	*	10	8
Lane	0	0	0	0	1373	1409	1329	1381	0	0	0	0	0	0	1348	1394
Day	0		0		2782		2710		0		0		0		2742	
AM Peak	-	-	-	-	11:00	06:00	11:00	06:00	-	-	-	-	-	-	11:00	06:00
Vol.	-	-	-	-	87	130	86	131	-	-	-	-	-	-	86	130
PM Peak	-	-	-	-	15:00	13:00	14:00	14:00	-	-	-	-	-	-	15:00	14:00
Vol.	-	-	-	-	139	109	126	98	-	-	-	-	-	-	130	97

Comb. Total	0	0	2782	2710	0	0	0	2742
ADT	ADT 2,746	AADT 2,746						

LEVEL OF SERVICE DEFINITIONS

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

SIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

LOS	<u>Average Vehicle Delay</u> sec/vehicle	<u>Operational Characteristics</u>
A	<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	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.
C	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.
D	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.
E	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.
F	>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.

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↑		↑↑	↑			
Traffic Vol, veh/h	0	20	0	0	179	59	0	137	61	0	0	0
Future Vol, veh/h	0	20	0	0	179	59	0	137	61	0	0	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	-	-	-	-	-	-	-	-	250	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16979	-
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	22	0	0	195	64	0	149	66	0	0	0

Major/Minor	Minor2		Minor1		Major1					
Conflicting Flow All	-	215	-	-	149	75	-	0	0	
Stage 1	-	0	-	-	149	-	-	-	-	
Stage 2	-	215	-	-	0	-	-	-	-	
Critical Hdwy	-	6.54	-	-	6.54	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	5.54	-	-	-	-	-	-	-	
Follow-up Hdwy	-	4.02	-	-	4.02	3.32	-	-	-	
Pot Cap-1 Maneuver	0	682	0	0	742	971	0	-	-	
Stage 1	0	-	0	0	773	-	0	-	-	
Stage 2	0	724	0	0	-	-	0	-	-	
Platoon blocked, %								-	-	
Mov Cap-1 Maneuver	-	682	-	-	742	971	-	-	-	
Mov Cap-2 Maneuver	-	682	-	-	742	-	-	-	-	
Stage 1	-	-	-	-	773	-	-	-	-	
Stage 2	-	724	-	-	-	-	-	-	-	

Approach	EB		WB		NB	
HCM Control Delay, s	10.5		11		0	
HCM LOS	B		B			

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1WBLn2		
Capacity (veh/h)	-	-	682	742	971
HCM Lane V/C Ratio	-	-	0.032	0.262	0.066
HCM Control Delay (s)	-	-	10.5	11.6	9
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.1	1.1	0.2

Intersection						
Int Delay, s/veh	5.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	179	0	0	0	20	206
Future Vol, veh/h	179	0	0	0	20	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	195	0	0	0	22	224




Major/Minor	Minor1	Major2	
Conflicting Flow All	268	-	0
Stage 1	0	-	-
Stage 2	268	-	-
Critical Hdwy	6.42	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	-	2.218
Pot Cap-1 Maneuver	721	0	-
Stage 1	-	0	-
Stage 2	777	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	721	-	-
Mov Cap-2 Maneuver	721	-	-
Stage 1	-	-	-
Stage 2	777	-	-

Approach	WB	SB
HCM Control Delay, s	11.8	
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	721	-	-
HCM Lane V/C Ratio	0.27	-	-
HCM Control Delay (s)	11.8	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	1.1	-	-

Intersection						
Intersection Delay, s/veh	3.7					
Intersection LOS	A					
Approach	EB		WB		NB	SB
Entry Lanes	2		2		1	1
Conflicting Circle Lanes	2		2		2	2
Adj Approach Flow, veh/h	88		34		0	225
Demand Flow Rate, veh/h	90		35		0	230
Vehicles Circulating, veh/h	0		90		90	35
Vehicles Exiting, veh/h	264		0		0	90
Ped Vol Crossing Leg, #/h	0		0		0	0
Ped Cap Adj	1.000		1.000		1.000	1.000
Approach Delay, s/veh	3.3		3.0		0.0	4.0
Approach LOS	A		A		-	A
Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	L	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	1.000	0.000	0.457	0.543	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
Entry Flow, veh/h	90	0	16	19	0	230
Cap Entry Lane, veh/h	1350	1420	1243	1316	1316	1378
Entry HV Adj Factor	0.978	1.000	1.008	0.957	1.000	0.978
Flow Entry, veh/h	88	0	16	18	0	225
Cap Entry, veh/h	1320	1420	1252	1259	1316	1349
V/C Ratio	0.067	0.000	0.013	0.014	0.000	0.167
Control Delay, s/veh	3.3	2.5	3.0	3.0	2.7	4.0
LOS	A	A	A	A	A	A
95th %tile Queue, veh	0	0	0	0	0	1

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑	↗			
Traffic Vol, veh/h	0	58	0	0	109	36	0	192	176	0	0	0
Future Vol, veh/h	0	58	0	0	109	36	0	192	176	0	0	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	-	-	-	-	-	-	-	-	250	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16979	-
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	63	0	0	118	39	0	209	191	0	0	0
Major/Minor	Minor2		Minor1		Major1							
Conflicting Flow All	-	400	-	-	209	105	-	0	0			
Stage 1	-	0	-	-	209	-	-	-	-			
Stage 2	-	400	-	-	0	-	-	-	-			
Critical Hdwy	-	6.54	-	-	6.54	6.94	-	-	-			
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-			
Critical Hdwy Stg 2	-	5.54	-	-	-	-	-	-	-			
Follow-up Hdwy	-	4.02	-	-	4.02	3.32	-	-	-			
Pot Cap-1 Maneuver	0	537	0	0	687	929	0	-	-			
Stage 1	0	-	0	0	728	-	0	-	-			
Stage 2	0	600	0	0	-	-	0	-	-			
Platoon blocked, %							-	-				
Mov Cap-1 Maneuver	-	537	-	-	687	929	-	-	-			
Mov Cap-2 Maneuver	-	537	-	-	687	-	-	-	-			
Stage 1	-	-	-	-	728	-	-	-	-			
Stage 2	-	600	-	-	-	-	-	-	-			
Approach	EB		WB		NB							
HCM Control Delay, s	12.6		10.7		0							
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1WBLn2							
Capacity (veh/h)	-		-		537 687 929							
HCM Lane V/C Ratio	-		-		0.117 0.172 0.042							
HCM Control Delay (s)	-		-		12.6 11.3 9							
HCM Lane LOS	-		-		B B A							
HCM 95th %tile Q(veh)	-		-		0.4 0.6 0.1							

Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	109	0	0	0	58	196
Future Vol, veh/h	109	0	0	0	58	196
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	118	0	0	0	63	213

Major/Minor	Minor1	Major2	
Conflicting Flow All	339	-	0
Stage 1	0	-	-
Stage 2	339	-	-
Critical Hdwy	6.42	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	-	2.218
Pot Cap-1 Maneuver	657	0	-
Stage 1	-	0	-
Stage 2	722	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	657	-	-
Mov Cap-2 Maneuver	657	-	-
Stage 1	-	-	-
Stage 2	722	-	-

Approach	WB	SB
HCM Control Delay, s	11.7	
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	657	-	-
HCM Lane V/C Ratio	0.18	-	-
HCM Control Delay (s)	11.7	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-

Intersection						
Intersection Delay, s/veh	4.0					
Intersection LOS	A					
Approach	EB		WB		NB	SB
Entry Lanes	2		2		1	1
Conflicting Circle Lanes	2		2		2	2
Adj Approach Flow, veh/h	254		23		0	135
Demand Flow Rate, veh/h	259		23		0	138
Vehicles Circulating, veh/h	0		259		259	23
Vehicles Exiting, veh/h	161		0		0	259
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		3.4		0.0	3.4
Approach LOS	A		A		-	A
Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	L	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	1.000	0.000	0.478	0.522	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
Entry Flow, veh/h	259	0	11	12	0	138
Cap Entry Lane, veh/h	1350	1420	1064	1139	1139	1393
Entry HV Adj Factor	0.981	1.000	0.963	0.996	1.000	0.978
Flow Entry, veh/h	254	0	11	12	0	135
Cap Entry, veh/h	1324	1420	1025	1135	1139	1362
V/C Ratio	0.192	0.000	0.010	0.011	0.000	0.099
Control Delay, s/veh	4.3	2.5	3.6	3.3	3.2	3.4
LOS	A	A	A	A	A	A
95th %tile Queue, veh	1	0	0	0	0	0

HCM 6th TWSC
1: Powhaton Rd & Alameda Ave

2024 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↑		↑↑	↑			
Traffic Vol, veh/h	0	56	0	0	179	146	0	300	65	0	0	0
Future Vol, veh/h	0	56	0	0	179	146	0	300	65	0	0	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	-	-	-	-	-	-	-	-	250	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16979	-
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	61	0	0	195	159	0	326	71	0	0	0




Major/Minor	Minor2		Minor1		Major1					
Conflicting Flow All	-	397	-	-	326	163	-	0	0	
Stage 1	-	0	-	-	326	-	-	-	-	
Stage 2	-	397	-	-	0	-	-	-	-	
Critical Hdwy	-	6.54	-	-	6.54	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	5.54	-	-	-	-	-	-	-	
Follow-up Hdwy	-	4.02	-	-	4.02	3.32	-	-	-	
Pot Cap-1 Maneuver	0	539	0	0	591	853	0	-	-	
Stage 1	0	-	0	0	647	-	0	-	-	
Stage 2	0	602	0	0	-	-	0	-	-	
Platoon blocked, %								-	-	
Mov Cap-1 Maneuver	-	539	-	-	591	853	-	-	-	
Mov Cap-2 Maneuver	-	539	-	-	591	-	-	-	-	
Stage 1	-	-	-	-	647	-	-	-	-	
Stage 2	-	602	-	-	-	-	-	-	-	

Approach	EB	WB	NB
HCM Control Delay, s	12.5	12.3	0
HCM LOS	B	B	

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1WBLn2
Capacity (veh/h)	-	-	539 591 853
HCM Lane V/C Ratio	-	-	0.113 0.329 0.186
HCM Control Delay (s)	-	-	12.5 14.1 10.2
HCM Lane LOS	-	-	B B B
HCM 95th %tile Q(veh)	-	-	0.4 1.4 0.7

HCM 6th TWSC
101: Powhatan SB & Alameda Ave

2024 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	179	0	0	0	56	254
Future Vol, veh/h	179	0	0	0	56	254
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	195	0	0	0	61	276

Major/Minor	Minor1	Major2	
Conflicting Flow All	398	-	0
Stage 1	0	-	-
Stage 2	398	-	-
Critical Hdwy	6.42	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	-	2.218
Pot Cap-1 Maneuver	607	0	-
Stage 1	-	0	-
Stage 2	678	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	607	-	-
Mov Cap-2 Maneuver	607	-	-
Stage 1	-	-	-
Stage 2	678	-	-

Approach	WB	SB
HCM Control Delay, s	13.7	
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	607	-	-
HCM Lane V/C Ratio	0.321	-	-
HCM Control Delay (s)	13.7	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	1.4	-	-

HCM 6th Roundabout
2: Trussville Rd & Alameda Ave

2024 Total Traffic
AM Peak Hour

Intersection						
Intersection Delay, s/veh	3.9					
Intersection LOS	A					
Approach	EB		WB		NB	SB
Entry Lanes	2		2		1	1
Conflicting Circle Lanes	2		2		2	2
Adj Approach Flow, veh/h	131		61		99	238
Demand Flow Rate, veh/h	134		62		101	243
Vehicles Circulating, veh/h	13		191		118	131
Vehicles Exiting, veh/h	360		28		28	122
Ped Vol Crossing Leg, #/h	0		0		0	0
Ped Cap Adj	1.000		1.000		1.000	1.000
Approach Delay, s/veh	3.1		3.4		3.5	4.5
Approach LOS	A		A		A	A
Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	L	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.672	0.328	0.468	0.532	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
Entry Flow, veh/h	90	44	29	33	101	243
Cap Entry Lane, veh/h	1334	1405	1132	1207	1285	1270
Entry HV Adj Factor	0.978	0.988	0.986	0.977	0.984	0.979
Flow Entry, veh/h	88	43	29	32	99	238
Cap Entry, veh/h	1304	1388	1117	1180	1265	1243
V/C Ratio	0.067	0.031	0.026	0.027	0.079	0.191
Control Delay, s/veh	3.3	2.8	3.4	3.3	3.5	4.5
LOS	A	A	A	A	A	A
95th %tile Queue, veh	0	0	0	0	0	1




HCM 6th TWSC
3: Waterloo St & Alameda Ave

2024 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗			↗			↗
Traffic Vol, veh/h	0	0	25	0	25	0	0	0	0	0	0	31
Future Vol, veh/h	0	0	25	0	25	0	0	0	0	0	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	27	0	27	0	0	0	0	0	0	34
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	0	-	-	14
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	-	0	0	1062
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	-	-	-	1062
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			8.5		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1						
Capacity (veh/h)	-	-	-	-	-	1062						
HCM Lane V/C Ratio	-	-	-	-	-	0.032						
HCM Control Delay (s)	0	-	-	-	-	8.5						
HCM Lane LOS	A	-	-	-	-	A						
HCM 95th %tile Q(veh)	-	-	-	-	-	0.1						

HCM 6th TWSC
5: Trussville Rd & PA-11 North Access

2024 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	10	81	1	3	22
Future Vol, veh/h	4	10	81	1	3	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	-	-	-	-	-
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	4	11	88	1	3	24

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	119	89	0
Stage 1	89	-	-
Stage 2	30	-	-
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	969	-
Stage 1	934	-	-
Stage 2	993	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	875	969	-
Mov Cap-2 Maneuver	875	-	-
Stage 1	934	-	-
Stage 2	991	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	940	1506
HCM Lane V/C Ratio	-	-	0.016	0.002
HCM Control Delay (s)	-	-	8.9	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC
6: Powhaton Rd & PA-6 Access

2024 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↑		↑↑				
Traffic Vol, veh/h	0	30	0	0	5	86	0	279	3	0	0	0
Future Vol, veh/h	0	30	0	0	5	86	0	279	3	0	0	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	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	16979	-
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	33	0	0	5	93	0	303	3	0	0	0

Major/Minor	Minor2		Minor1		Major1					
Conflicting Flow All	-	306	-	-	305	153	-	0	0	
Stage 1	-	0	-	-	305	-	-	-	-	
Stage 2	-	306	-	-	0	-	-	-	-	
Critical Hdwy	-	6.54	-	-	6.54	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	5.54	-	-	-	-	-	-	-	
Follow-up Hdwy	-	4.02	-	-	4.02	3.32	-	-	-	
Pot Cap-1 Maneuver	0	606	0	0	607	866	0	-	-	
Stage 1	0	-	0	0	661	-	0	-	-	
Stage 2	0	660	0	0	-	-	0	-	-	
Platoon blocked, %								-	-	
Mov Cap-1 Maneuver	-	606	-	-	607	866	-	-	-	
Mov Cap-2 Maneuver	-	606	-	-	608	-	-	-	-	
Stage 1	-	-	-	-	661	-	-	-	-	
Stage 2	-	660	-	-	-	-	-	-	-	

Approach	EB		WB		NB	
HCM Control Delay, s	11.3		9.8		0	
HCM LOS	B		A			

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1WBLn2		
Capacity (veh/h)	-	-	606	608	866
HCM Lane V/C Ratio	-	-	0.054	0.009	0.108
HCM Control Delay (s)	-	-	11.3	11	9.7
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0	0.4

HCM 6th TWSC
106: Powhatan SB & PA-6 Access

2024 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰				↰	↱
Traffic Vol, veh/h	5	0	0	0	30	403
Future Vol, veh/h	5	0	0	0	30	403
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	0	0	0	33	438

Major/Minor	Minor1	Major2
Conflicting Flow All	504	0
Stage 1	0	-
Stage 2	504	-
Critical Hdwy	6.42	4.12
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	5.42	-
Follow-up Hdwy	3.518	2.218
Pot Cap-1 Maneuver	528	-
Stage 1	-	-
Stage 2	607	-
Platoon blocked, %		-
Mov Cap-1 Maneuver	528	-
Mov Cap-2 Maneuver	528	-
Stage 1	-	-
Stage 2	607	-

Approach	WB	SB
HCM Control Delay, s	11.9	
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	528	-	-
HCM Lane V/C Ratio	0.01	-	-
HCM Control Delay (s)	11.9	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0	-	-






HCM 6th TWSC
7: Trussville Rd & PA-7 Access/PA-11 South Access

2024 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	0	5	18	0	49	2	8	6	10	7	9
Future Vol, veh/h	25	0	5	18	0	49	2	8	6	10	7	9
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	-	-	-	-	-	-	-	-	-	-	-	-
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	27	0	5	20	0	53	2	9	7	11	8	10
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	78	55	13	55	57	13	18	0	0	16	0	0
Stage 1	35	35	-	17	17	-	-	-	-	-	-	-
Stage 2	43	20	-	38	40	-	-	-	-	-	-	-
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	911	836	1067	943	834	1067	1599	-	-	1602	-	-
Stage 1	981	866	-	1002	881	-	-	-	-	-	-	-
Stage 2	971	879	-	977	862	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	860	829	1067	933	827	1067	1599	-	-	1602	-	-
Mov Cap-2 Maneuver	860	829	-	933	827	-	-	-	-	-	-	-
Stage 1	980	860	-	1001	880	-	-	-	-	-	-	-
Stage 2	922	878	-	965	856	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.2		8.8			0.9			2.8			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1599	-	-	889	1027	1602	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.037	0.071	0.007	-	-				
HCM Control Delay (s)	7.3	0	-	9.2	8.8	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-				

HCM 6th TWSC
8: Monaghan Rd & PA-12 Access

2024 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	8.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	7	0	0	0	0
Future Vol, veh/h	26	7	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	350	-	-	-
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	28	8	0	0	0	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1	1	0
Stage 1	1	-	-
Stage 2	0	-	-
Critical Hdwy	5.74	7.14	5.34
Critical Hdwy Stg 1	6.64	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.82	3.92	3.12
Pot Cap-1 Maneuver	941	917	1153
Stage 1	941	-	-
Stage 2	-	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	941	917	1153
Mov Cap-2 Maneuver	941	-	-
Stage 1	941	-	-
Stage 2	-	-	-




Approach	EB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1153	-	936	-	-
HCM Lane V/C Ratio	-	-	0.038	-	-
HCM Control Delay (s)	0	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC
9: Powhaton Rd & Exposition Ave/E. Exposition Ave

2024 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑				
Traffic Vol, veh/h	0	18	0	0	127	77	0	205	36	0	0	0
Future Vol, veh/h	0	18	0	0	127	77	0	205	36	0	0	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	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16979	-
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	20	0	0	138	84	0	223	39	0	0	0
Major/Minor	Minor2		Minor1		Major1							
Conflicting Flow All	-	262	-	-	243	131	-	0	0			
Stage 1	-	0	-	-	243	-	-	-	-			
Stage 2	-	262	-	-	0	-	-	-	-			
Critical Hdwy	-	6.54	-	-	6.54	6.94	-	-	-			
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-			
Critical Hdwy Stg 2	-	5.54	-	-	-	-	-	-	-			
Follow-up Hdwy	-	4.02	-	-	4.02	3.32	-	-	-			
Pot Cap-1 Maneuver	0	642	0	0	658	894	0	-	-			
Stage 1	0	-	0	0	703	-	0	-	-			
Stage 2	0	690	0	0	-	-	0	-	-			
Platoon blocked, %								-	-			
Mov Cap-1 Maneuver	-	642	-	-	658	894	-	-	-			
Mov Cap-2 Maneuver	-	642	-	-	658	-	-	-	-			
Stage 1	-	-	-	-	703	-	-	-	-			
Stage 2	-	690	-	-	-	-	-	-	-			
Approach	EB		WB		NB							
HCM Control Delay, s	10.8		11		0							
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1WBLn2							
Capacity (veh/h)	-		-		642 658 894							
HCM Lane V/C Ratio	-		-		0.03 0.21 0.094							
HCM Control Delay (s)	-		-		10.8 11.9 9.4							
HCM Lane LOS	-		-		B B A							
HCM 95th %tile Q(veh)	-		-		0.1 0.8 0.3							

Intersection						
Int Delay, s/veh	3.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	129	0	0	0	18	390
Future Vol, veh/h	129	0	0	0	18	390
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	140	0	0	0	20	424





Major/Minor	Minor1	Major2
Conflicting Flow All	464	0
Stage 1	0	-
Stage 2	464	-
Critical Hdwy	6.42	4.12
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	5.42	-
Follow-up Hdwy	3.518	2.218
Pot Cap-1 Maneuver	556	0
Stage 1	-	0
Stage 2	633	0
Platoon blocked, %		-
Mov Cap-1 Maneuver	556	-
Mov Cap-2 Maneuver	556	-
Stage 1	-	-
Stage 2	633	-

Approach	WB	SB
HCM Control Delay, s	13.6	
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	556	-	-
HCM Lane V/C Ratio	0.252	-	-
HCM Control Delay (s)	13.6	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	1	-	-





HCM 6th TWSC
10: E. Exposition Ave & PA-5 Access

2024 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	40	158	0	2	47
Future Vol, veh/h	14	40	158	0	2	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	15	43	172	0	2	51
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	172	0	-	0	245	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	73	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1405	-	-	-	743	872
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	950	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1405	-	-	-	735	872
Mov Cap-2 Maneuver	-	-	-	-	735	-
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	950	-
Approach	EB	WB		SB		
HCM Control Delay, s	2	0		9.4		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1405	-	-	-	865	
HCM Lane V/C Ratio	0.011	-	-	-	0.062	
HCM Control Delay (s)	7.6	-	-	-	9.4	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

HCM 6th TWSC
11: E. Exposition Ave & PA-7 Access

2024 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	28	112	1	2	46
Future Vol, veh/h	15	28	112	1	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	30	122	1	2	50
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	123	0	-	0	185	123
Stage 1	-	-	-	-	123	-
Stage 2	-	-	-	-	62	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1464	-	-	-	804	928
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	961	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1464	-	-	-	795	928
Mov Cap-2 Maneuver	-	-	-	-	795	-
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	961	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.6	0		9.1		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1464	-	-	-	922	
HCM Lane V/C Ratio	0.011	-	-	-	0.057	
HCM Control Delay (s)	7.5	-	-	-	9.1	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	





HCM 6th Roundabout
12: E. Exposition Ave & Trussville Rd

2024 Total Traffic
AM Peak Hour

Intersection			
Intersection Delay, s/veh	3.2		
Intersection LOS	A		
Approach	EB	WB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	32	95	32
Demand Flow Rate, veh/h	32	97	33
Vehicles Circulating, veh/h	2	14	94
Vehicles Exiting, veh/h	125	20	17
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	2.8	3.3	3.2
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	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	32	97	33
Cap Entry Lane, veh/h	1377	1360	1254
Entry HV Adj Factor	0.989	0.981	0.970
Flow Entry, veh/h	32	95	32
Cap Entry, veh/h	1362	1334	1216
V/C Ratio	0.023	0.071	0.026
Control Delay, s/veh	2.8	3.3	3.2
LOS	A	A	A
95th %tile Queue, veh	0	0	0

HCM 6th TWSC
13: E. Exposition Ave & PA-12 Access

2024 Total Traffic
AM Peak Hour




Intersection						
Int Delay, s/veh	7.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	0	7	0	0	81
Future Vol, veh/h	19	0	7	0	0	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	21	0	8	0	0	88
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	8	0	-	0	50	8
Stage 1	-	-	-	-	8	-
Stage 2	-	-	-	-	42	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1612	-	-	-	959	1074
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	980	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1612	-	-	-	947	1074
Mov Cap-2 Maneuver	-	-	-	-	947	-
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	980	-
Approach	EB	WB		SB		
HCM Control Delay, s	7.3	0		8.7		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1612	-	-	-	1074	
HCM Lane V/C Ratio	0.013	-	-	-	0.082	
HCM Control Delay (s)	7.3	-	-	-	8.7	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↗		↑↑	↗			
Traffic Vol, veh/h	0	190	0	0	109	97	0	304	190	0	0	0
Future Vol, veh/h	0	190	0	0	109	97	0	304	190	0	0	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	-	-	-	-	-	-	-	-	250	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16979	-
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	207	0	0	118	105	0	330	207	0	0	0

Major/Minor	Minor2		Minor1		Major1		
Conflicting Flow All	-	537	-	-	330	165	0
Stage 1	-	0	-	-	330	-	-
Stage 2	-	537	-	-	0	-	-
Critical Hdwy	-	6.54	-	-	6.54	6.94	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-
Critical Hdwy Stg 2	-	5.54	-	-	-	-	-
Follow-up Hdwy	-	4.02	-	-	4.02	3.32	-
Pot Cap-1 Maneuver	0	449	0	0	588	850	0
Stage 1	0	-	0	0	644	-	0
Stage 2	0	521	0	0	-	-	0
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	449	-	-	588	850	-
Mov Cap-2 Maneuver	-	449	-	-	588	-	-
Stage 1	-	-	-	-	644	-	-
Stage 2	-	521	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	19.7	11.3	0
HCM LOS	C	B	

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1WBLn2
Capacity (veh/h)	-	-	449 588 850
HCM Lane V/C Ratio	-	-	0.46 0.201 0.124
HCM Control Delay (s)	-	-	19.7 12.7 9.8
HCM Lane LOS	-	-	C B A
HCM 95th %tile Q(veh)	-	-	2.4 0.7 0.4

Intersection						
Int Delay, s/veh	3.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	109	0	0	0	190	362
Future Vol, veh/h	109	0	0	0	190	362
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	118	0	0	0	207	393

Major/Minor	Minor1	Major2	
Conflicting Flow All	807	-	0
Stage 1	0	-	-
Stage 2	807	-	-
Critical Hdwy	6.42	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	-	2.218
Pot Cap-1 Maneuver	351	0	-
Stage 1	-	0	-
Stage 2	439	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	351	-	-
Mov Cap-2 Maneuver	351	-	-
Stage 1	-	-	-
Stage 2	439	-	-

Approach	WB	SB
HCM Control Delay, s	20.4	
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	351	-	-
HCM Lane V/C Ratio	0.338	-	-
HCM Control Delay (s)	20.4	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	1.5	-	-

HCM 6th Roundabout
2: Trussville Rd & Alameda Ave




2024 Total Traffic
PM Peak Hour

Intersection						
Intersection Delay, s/veh	3.9					
Intersection LOS	A					
Approach	EB		WB		NB	SB
Entry Lanes	2		2		1	1
Conflicting Circle Lanes	2		2		2	2
Adj Approach Flow, veh/h	414		41		57	142
Demand Flow Rate, veh/h	422		42		58	145
Vehicles Circulating, veh/h	7		317		353	92
Vehicles Exiting, veh/h	230		94		76	267
Ped Vol Crossing Leg, #/h	0		0		0	0
Ped Cap Adj	1.000		1.000		1.000	1.000
Approach Delay, s/veh	4.0		3.7		4.0	3.7
Approach LOS	A		A		A	A
Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	L	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.614	0.386	0.476	0.524	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
Entry Flow, veh/h	259	163	20	22	58	145
Cap Entry Lane, veh/h	1341	1412	1008	1085	1052	1313
Entry HV Adj Factor	0.981	0.983	0.968	0.992	0.980	0.979
Flow Entry, veh/h	254	160	19	22	57	142
Cap Entry, veh/h	1315	1387	976	1076	1031	1285
V/C Ratio	0.193	0.115	0.020	0.020	0.055	0.110
Control Delay, s/veh	4.4	3.5	3.9	3.5	4.0	3.7
LOS	A	A	A	A	A	A
95th %tile Queue, veh	1	0	0	0	0	0

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	0	0	85	0	16	0	0	0	0	0	0	21
Future Vol, veh/h	0	0	85	0	16	0	0	0	0	0	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	92	0	17	0	0	0	0	0	0	23
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	0	-	-	9
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	-	0	0	1070
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	-	-	-	1070
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			8.4		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1						
Capacity (veh/h)	-	-	-	-	-	1070						
HCM Lane V/C Ratio	-	-	-	-	-	0.021						
HCM Control Delay (s)	0	-	-	-	-	8.4						
HCM Lane LOS	A	-	-	-	-	A						
HCM 95th %tile Q(veh)	-	-	-	-	-	0.1						

HCM 6th TWSC
5: Trussville Rd & PA-11 North Access

2024 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	7	45	4	12	57
Future Vol, veh/h	3	7	45	4	12	57
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	3	8	49	4	13	62

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	139	51	0
Stage 1	51	-	-
Stage 2	88	-	-
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	854	1017	-
Stage 1	971	-	-
Stage 2	935	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	846	1017	-
Mov Cap-2 Maneuver	846	-	-
Stage 1	971	-	-
Stage 2	927	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	959	1553
HCM Lane V/C Ratio	-	-	0.011	0.008
HCM Control Delay (s)	-	-	8.8	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↑		↑↑				
Traffic Vol, veh/h	0	100	0	0	4	58	0	436	11	0	0	0
Future Vol, veh/h	0	100	0	0	4	58	0	436	11	0	0	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	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	16979	-
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	109	0	0	4	63	0	474	12	0	0	0

Major/Minor	Minor2		Minor1		Major1					
Conflicting Flow All	-	486	-	-	480	243	-	0	0	
Stage 1	-	0	-	-	480	-	-	-	-	
Stage 2	-	486	-	-	0	-	-	-	-	
Critical Hdwy	-	6.54	-	-	6.54	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	5.54	-	-	-	-	-	-	-	
Follow-up Hdwy	-	4.02	-	-	4.02	3.32	-	-	-	
Pot Cap-1 Maneuver	0	480	0	0	484	758	0	-	-	
Stage 1	0	-	0	0	553	-	0	-	-	
Stage 2	0	549	0	0	-	-	0	-	-	
Platoon blocked, %								-	-	
Mov Cap-1 Maneuver	-	480	-	-	484	758	-	-	-	
Mov Cap-2 Maneuver	-	480	-	-	515	-	-	-	-	
Stage 1	-	-	-	-	553	-	-	-	-	
Stage 2	-	549	-	-	-	-	-	-	-	

Approach	EB		WB		NB	
HCM Control Delay, s	14.7		10.3		0	
HCM LOS	B		B			

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	WBLn2
Capacity (veh/h)	-	-	480	515	758
HCM Lane V/C Ratio	-	-	0.226	0.008	0.083
HCM Control Delay (s)	-	-	14.7	12.1	10.2
HCM Lane LOS	-	-	B	B	B
HCM 95th %tile Q(veh)	-	-	0.9	0	0.3

HCM 6th TWSC
106: Powhatan SB & PA-6 Access

2024 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰				↰	↱
Traffic Vol, veh/h	4	0	0	0	100	371
Future Vol, veh/h	4	0	0	0	100	371
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	0	0	0	109	403

Major/Minor	Minor1	Major2
Conflicting Flow All	621	0
Stage 1	0	-
Stage 2	621	-
Critical Hdwy	6.42	4.12
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	5.42	-
Follow-up Hdwy	3.518	2.218
Pot Cap-1 Maneuver	451	-
Stage 1	-	-
Stage 2	536	-
Platoon blocked, %		-
Mov Cap-1 Maneuver	451	-
Mov Cap-2 Maneuver	451	-
Stage 1	-	-
Stage 2	536	-

Approach	WB	SB
HCM Control Delay, s	13.1	
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	451	-	-
HCM Lane V/C Ratio	0.01	-	-
HCM Control Delay (s)	13.1	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0	-	-






HCM 6th TWSC
7: Trussville Rd & PA-7 Access/PA-11 South Access

2024 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	0	4	13	0	30	6	6	22	34	5	21
Future Vol, veh/h	13	0	4	13	0	30	6	6	22	34	5	21
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	-	-	-	-	-	-	-	-	-	-	-	-
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	14	0	4	14	0	33	7	7	24	37	5	23
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	141	136	17	126	135	19	28	0	0	31	0	0
Stage 1	91	91	-	33	33	-	-	-	-	-	-	-
Stage 2	50	45	-	93	102	-	-	-	-	-	-	-
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	829	755	1062	848	756	1059	1585	-	-	1582	-	-
Stage 1	916	820	-	983	868	-	-	-	-	-	-	-
Stage 2	963	857	-	914	811	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	786	733	1062	826	734	1059	1585	-	-	1582	-	-
Mov Cap-2 Maneuver	786	733	-	826	734	-	-	-	-	-	-	-
Stage 1	911	800	-	978	864	-	-	-	-	-	-	-
Stage 2	929	853	-	888	792	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.4		8.9		1.3		4.2					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1585	-	-	837	976	1582	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.022	0.048	0.023	-	-				
HCM Control Delay (s)	7.3	0	-	9.4	8.9	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.1	-	-				

HCM 6th TWSC
8: Monaghan Rd & PA-12 Access

2024 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	8.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	5	0	0	0	0
Future Vol, veh/h	16	5	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	350	-	-	-
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	5	0	0	0	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1	1	0
Stage 1	1	-	-
Stage 2	0	-	-
Critical Hdwy	5.74	7.14	5.34
Critical Hdwy Stg 1	6.64	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.82	3.92	3.12
Pot Cap-1 Maneuver	941	917	1153
Stage 1	941	-	-
Stage 2	-	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	941	917	1153
Mov Cap-2 Maneuver	941	-	-
Stage 1	941	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1153	-	935	-	-
HCM Lane V/C Ratio	-	-	0.024	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC
9: Powhatan Rd & Exposition Ave/E. Exposition Ave

2024 Total Traffic
PM Peak Hour

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	0	66	0	0	89	54	0	393	134	0	0	0
Future Vol, veh/h	0	66	0	0	89	54	0	393	134	0	0	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	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16979	-
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	72	0	0	97	59	0	427	146	0	0	0




Major/Minor	Minor2		Minor1		Major1					
Conflicting Flow All	-	573	-	-	500	287	-	0	0	
Stage 1	-	0	-	-	500	-	-	-	-	
Stage 2	-	573	-	-	0	-	-	-	-	
Critical Hdwy	-	6.54	-	-	6.54	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	5.54	-	-	-	-	-	-	-	
Follow-up Hdwy	-	4.02	-	-	4.02	3.32	-	-	-	
Pot Cap-1 Maneuver	0	428	0	0	471	710	0	-	-	
Stage 1	0	-	0	0	541	-	0	-	-	
Stage 2	0	502	0	0	-	-	0	-	-	
Platoon blocked, %								-	-	
Mov Cap-1 Maneuver	-	428	-	-	471	710	-	-	-	
Mov Cap-2 Maneuver	-	428	-	-	471	-	-	-	-	
Stage 1	-	-	-	-	541	-	-	-	-	
Stage 2	-	502	-	-	-	-	-	-	-	

Approach	EB		WB		NB	
HCM Control Delay, s	15.1		13.1		0	
HCM LOS	C		B			

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1WBLn2		
Capacity (veh/h)	-	-	428	471	710
HCM Lane V/C Ratio	-	-	0.168	0.205	0.083
HCM Control Delay (s)	-	-	15.1	14.6	10.5
HCM Lane LOS	-	-	C	B	B
HCM 95th %tile Q(veh)	-	-	0.6	0.8	0.3

Intersection

Int Delay, s/veh 2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	89	0	0	0	66	309
Future Vol, veh/h	89	0	0	0	66	309
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	0	0	0	72	336





Major/Minor	Minor1	Major2
Conflicting Flow All	480	0
Stage 1	0	-
Stage 2	480	-
Critical Hdwy	6.42	4.12
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	5.42	-
Follow-up Hdwy	3.518	2.218
Pot Cap-1 Maneuver	545	0
Stage 1	-	0
Stage 2	622	0
Platoon blocked, %		-
Mov Cap-1 Maneuver	545	-
Mov Cap-2 Maneuver	545	-
Stage 1	-	-
Stage 2	622	-

Approach	WB	SB
HCM Control Delay, s	13	
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	545	-	-
HCM Lane V/C Ratio	0.178	-	-
HCM Control Delay (s)	13	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-

HCM 6th TWSC
10: E. Exposition Ave & PA-5 Access

2024 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	52	148	110	0	1	33
Future Vol, veh/h	52	148	110	0	1	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	161	120	0	1	36





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	120	0	0 395 120
Stage 1	-	-	- 120 -
Stage 2	-	-	- 275 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1468	-	- 610 931
Stage 1	-	-	- 905 -
Stage 2	-	-	- 771 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1468	-	- 586 931
Mov Cap-2 Maneuver	-	-	- 586 -
Stage 1	-	-	- 870 -
Stage 2	-	-	- 771 -

Approach	EB	WB	SB
HCM Control Delay, s	2	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1468	-	-	-	915
HCM Lane V/C Ratio	0.039	-	-	-	0.04
HCM Control Delay (s)	7.5	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

HCM 6th TWSC
11: E. Exposition Ave & PA-7 Access

2024 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	94	79	0	0	32
Future Vol, veh/h	54	94	79	0	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	59	102	86	0	0	35

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	86	0	0 306 86
Stage 1	-	-	- 86 -
Stage 2	-	-	- 220 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1510	-	- 686 973
Stage 1	-	-	- 937 -
Stage 2	-	-	- 817 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1510	-	- 659 973
Mov Cap-2 Maneuver	-	-	- 659 -
Stage 1	-	-	- 900 -
Stage 2	-	-	- 817 -





Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1510	-	-	-	973
HCM Lane V/C Ratio	0.039	-	-	-	0.036
HCM Control Delay (s)	7.5	-	-	-	8.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection			
Intersection Delay, s/veh	3.2		
Intersection LOS	A		
Approach	EB	WB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	102	66	23
Demand Flow Rate, veh/h	104	67	23
Vehicles Circulating, veh/h	2	37	66
Vehicles Exiting, veh/h	87	69	38
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.3	3.2	2.9
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	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	104	67	23
Cap Entry Lane, veh/h	1377	1329	1290
Entry HV Adj Factor	0.978	0.981	1.000
Flow Entry, veh/h	102	66	23
Cap Entry, veh/h	1346	1303	1290
V/C Ratio	0.076	0.050	0.018
Control Delay, s/veh	3.3	3.2	2.9
LOS	A	A	A
95th %tile Queue, veh	0	0	0

HCM 6th TWSC
13: E. Exposition Ave & PA-12 Access

2024 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	7.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	63	0	5	0	0	55
Future Vol, veh/h	63	0	5	0	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	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	68	0	5	0	0	60

























Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	5	0	0 141 5
Stage 1	-	-	- 5 -
Stage 2	-	-	- 136 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1616	-	- 852 1078
Stage 1	-	-	- 1018 -
Stage 2	-	-	- 890 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1616	-	- 816 1078
Mov Cap-2 Maneuver	-	-	- 816 -
Stage 1	-	-	- 975 -
Stage 2	-	-	- 890 -

Approach	EB	WB	SB
HCM Control Delay, s	7.3	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1616	-	-	-	1078
HCM Lane V/C Ratio	0.042	-	-	-	0.055
HCM Control Delay (s)	7.3	-	-	-	8.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Timings
1: Powhaton Rd & Alameda Ave

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)	216	192	67	114	282	193	114	1075	73	116	683	197
Future Volume (vph)	216	192	67	114	282	193	114	1075	73	116	683	197
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	20.0	25.0	25.0	20.0	25.0	25.0	15.0	55.0	55.0	20.0	60.0	60.0
Total Split (%)	16.7%	20.8%	20.8%	16.7%	20.8%	20.8%	12.5%	45.8%	45.8%	16.7%	50.0%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
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	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	32.4	18.2	18.2	26.2	15.0	15.0	63.6	54.0	54.0	64.0	54.2	54.2
Actuated g/C Ratio	0.29	0.16	0.16	0.23	0.13	0.13	0.56	0.48	0.48	0.57	0.48	0.48
v/c Ratio	0.70	0.36	0.20	0.37	0.63	0.53	0.27	0.47	0.09	0.40	0.30	0.24
Control Delay	44.7	44.8	2.7	33.0	53.0	11.3	11.9	21.5	1.8	14.2	19.0	3.3
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	44.7	44.8	2.7	33.0	53.0	11.3	11.9	21.5	1.8	14.2	19.0	3.3
LOS	D	D	A	C	D	B	B	C	A	B	B	A
Approach Delay		38.8			35.5			19.5			15.3	
Approach LOS		D			D			B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 113.2

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 23.8

Intersection LOS: C

Intersection Capacity Utilization 64.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Powhaton Rd & Alameda Ave

			
20 s	55 s	20 s	25 s
			
15 s	60 s	20 s	25 s

HCM 6th Roundabout
2: Trussville Rd & Alameda Ave

























2040 Background Traffic
AM Peak Hour

Intersection						
Intersection Delay, s/veh 5.1						
Intersection LOS A						
Approach	EB		WB		NB	SB
Entry Lanes	2		2		1	1
Conflicting Circle Lanes	2		2		2	2
Adj Approach Flow, veh/h	402		511		81	234
Demand Flow Rate, veh/h	410		521		83	239
Vehicles Circulating, veh/h	121		177		444	515
Vehicles Exiting, veh/h	633		350		87	183
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		5.1		4.5	6.7
Approach LOS	A		A		A	A
Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.471	0.529	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
Entry Flow, veh/h	193	217	245	276	83	239
Cap Entry Lane, veh/h	1208	1281	1147	1222	974	917
Entry HV Adj Factor	0.978	0.981	0.980	0.981	0.980	0.979
Flow Entry, veh/h	189	213	240	271	81	234
Cap Entry, veh/h	1181	1257	1124	1198	955	898
V/C Ratio	0.160	0.169	0.214	0.226	0.085	0.261
Control Delay, s/veh	4.4	4.3	5.1	5.0	4.5	6.7
LOS	A	A	A	A	A	A
95th %tile Queue, veh	1	1	1	1	0	1

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Vol, veh/h	0	326	437	12	0	47
Future Vol, veh/h	0	326	437	12	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	343	460	13	0	49
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	230
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	-	-	-	0	772
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	772
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		10		
HCM LOS				B		
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	772		
HCM Lane V/C Ratio	-	-	-	0.064		
HCM Control Delay (s)	-	-	-	10		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.2		

Timings 4: Monaghan Rd & Alameda Ave

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)	100	176	50	140	267	279	81	776	86	175	564	100
Future Volume (vph)	100	176	50	140	267	279	81	776	86	175	564	100
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	15.0	15.0	10.0	14.0	14.0	10.0	25.0	25.0	10.0	25.0	25.0
Total Split (s)	12.0	25.0	25.0	12.0	25.0	25.0	10.0	48.0	48.0	15.0	53.0	53.0
Total Split (%)	12.0%	25.0%	25.0%	12.0%	25.0%	25.0%	10.0%	48.0%	48.0%	15.0%	53.0%	53.0%
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	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	20.6	13.7	13.7	21.7	17.1	17.1	56.7	50.2	50.2	62.7	55.0	55.0
Actuated g/C Ratio	0.21	0.14	0.14	0.22	0.17	0.17	0.57	0.50	0.50	0.63	0.55	0.55
v/c Ratio	0.42	0.38	0.16	0.52	0.47	0.64	0.17	0.32	0.11	0.42	0.21	0.11
Control Delay	34.0	40.7	1.0	37.1	40.3	16.3	8.8	15.9	1.5	10.9	12.8	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	40.7	1.0	37.1	40.3	16.3	8.8	15.9	1.5	10.9	12.8	1.8
LOS	C	D	A	D	D	B	A	B	A	B	B	A
Approach Delay		32.5			29.9			14.0			11.1	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 19.2

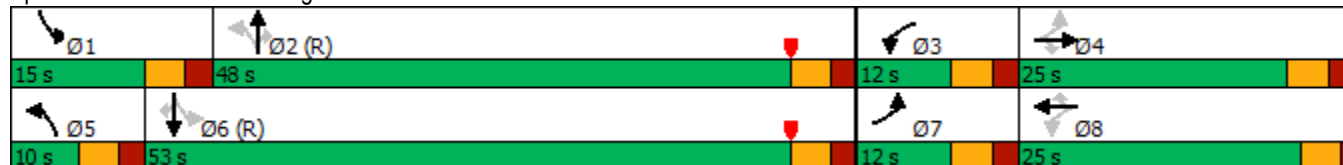
Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Monaghan Rd & Alameda Ave



HCM 6th TWSC
6: Powhatan Rd & Future Access/PA-6 Access

2040 Background Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	18.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱		↑↑↑	↱	↰	↑↑↑	
Traffic Vol, veh/h	75	5	50	27	5	63	50	1124	45	100	663	100
Future Vol, veh/h	75	5	50	27	5	63	50	1124	45	100	663	100
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	0	-	0	-	-	250	350	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	79	5	53	28	5	66	53	1183	47	105	698	105

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1543	2297	402	1781	2302	592	803	0	0	1230	0	0
Stage 1	961	961	-	1289	1289	-	-	-	-	-	-	-
Stage 2	582	1336	-	492	1013	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	121	38	511	87	38	385	487	-	-	303	-	-
Stage 1	212	333	-	125	232	-	-	-	-	-	-	-
Stage 2	425	221	-	482	315	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 52	16	511	33	16	385	487	-	-	303	-	-
Mov Cap-2 Maneuver	~ 52	16	-	65	77	-	-	-	-	-	-	-
Stage 1	138	217	-	81	151	-	-	-	-	-	-	-
Stage 2	221	144	-	276	206	-	-	-	-	-	-	-





Approach	EB	WB	NB	SB
HCM Control Delay, s	269.6	41.5	0.5	2.7
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	487	-	-	52	16	511	65	77	385	303	-	-
HCM Lane V/C Ratio	0.108	-	-	1.518	0.329	0.103	0.437	0.068	0.172	0.347	-	-
HCM Control Delay (s)	13.3	-	-	\$ 437.6	\$ 315.9	12.9	97.9	55.2	16.3	23.1	-	-
HCM Lane LOS	B	-	-	F	F	B	F	F	C	C	-	-
HCM 95th %tile Q(veh)	0.4	-	-	7.4	0.9	0.3	1.7	0.2	0.6	1.5	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						



















HCM 6th TWSC
8: Monaghan Rd & PA-13 Access

2040 Background Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	65	878	5	22	733
Future Vol, veh/h	14	65	878	5	22	733
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	350	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	68	924	5	23	772
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1282	465	0	0	929	0
Stage 1	927	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	*405	465	-	-	423	-
Stage 1	*268	-	-	-	-	-
Stage 2	*776	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	*383	465	-	-	423	-
Mov Cap-2 Maneuver	*383	-	-	-	-	-
Stage 1	*268	-	-	-	-	-
Stage 2	*734	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.9	0		0.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	448	423	-	
HCM Lane V/C Ratio	-	-	0.186	0.055	-	
HCM Control Delay (s)	-	-	14.9	14	-	
HCM Lane LOS	-	-	B	B	-	
HCM 95th %tile Q(veh)	-	-	0.7	0.2	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Timings
9: Powhatan Rd & E. Exposition Ave

2040 Background Traffic
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	25	5	158	5	5	895	71	174	546
Future Volume (vph)	25	5	158	5	5	895	71	174	546
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	7	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
Minimum Split (s)	10.0	23.0	10.0	23.0	10.0	24.0	24.0	10.0	24.0
Total Split (s)	15.0	25.0	15.0	25.0	15.0	60.0	60.0	20.0	65.0
Total Split (%)	12.5%	20.8%	12.5%	20.8%	12.5%	50.0%	50.0%	16.7%	54.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0
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	6.0	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	9.7	7.6	15.3	11.3	61.5	54.7	54.7	69.8	67.0
Actuated g/C Ratio	0.10	0.08	0.16	0.12	0.64	0.57	0.57	0.73	0.70
v/c Ratio	0.14	0.07	0.65	0.69	0.01	0.32	0.08	0.40	0.17
Control Delay	39.0	34.0	48.6	13.8	6.8	12.8	1.4	8.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	34.0	48.6	13.8	6.8	12.8	1.4	8.0	6.8
LOS	D	C	D	B	A	B	A	A	A
Approach Delay		37.6		25.7		11.9			7.0
Approach LOS		D		C		B			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 95.9

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 13.6


Intersection LOS: B

Intersection Capacity Utilization 61.0%

ICU Level of Service B






Analysis Period (min) 15

Splits and Phases: 9: Powhatan Rd & E. Exposition Ave

			
Ø1	Ø2	Ø3	Ø4
20 s	60 s	15 s	25 s
			
Ø5	Ø6	Ø7	Ø8
15 s	65 s	15 s	25 s






HCM 6th TWSC
10: Future PA-8 Access & E. Exposition Ave

2040 Background Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	18	13	433	29	24
Future Vol, veh/h	232	18	13	433	29	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	244	19	14	456	31	25
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	263	0	738	254
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	484	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1301	-	385	785
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	620	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1301	-	381	785
Mov Cap-2 Maneuver	-	-	-	-	381	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	613	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.2		13.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	497	-	-	1301	-	
HCM Lane V/C Ratio	0.112	-	-	0.011	-	
HCM Control Delay (s)	13.2	-	-	7.8	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.4	-	-	0	-	

HCM 6th TWSC
11: Future PA-10 Access & E. Exposition Ave





2040 Background Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	245	13	31	410	38	39
Future Vol, veh/h	245	13	31	410	38	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	258	14	33	432	40	41
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	272	0	763	265
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	498	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1291	-	372	774
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1291	-	362	774
Mov Cap-2 Maneuver	-	-	-	-	362	-
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	595	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.6		13.7	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	496	-	-	1291	-	
HCM Lane V/C Ratio	0.163	-	-	0.025	-	
HCM Control Delay (s)	13.7	-	-	7.9	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-	

Intersection				
Intersection Delay, s/veh	6.4			
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	298	448	297	84
Demand Flow Rate, veh/h	304	457	302	86
Vehicles Circulating, veh/h	175	186	214	561
Vehicles Exiting, veh/h	472	330	265	82
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.6	7.4	5.9	5.9
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	304	457	302	86
Cap Entry Lane, veh/h	1154	1141	1109	779
Entry HV Adj Factor	0.980	0.980	0.982	0.981
Flow Entry, veh/h	298	448	297	84
Cap Entry, veh/h	1131	1119	1089	764
V/C Ratio	0.263	0.400	0.272	0.110
Control Delay, s/veh	5.6	7.4	5.9	5.9
LOS	A	A	A	A
95th %tile Queue, veh	1	2	1	0





















HCM 6th TWSC
13: Future Access & E. Exposition Ave

2040 Background Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	294	14	14	383	43	43
Future Vol, veh/h	294	14	14	383	43	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	309	15	15	403	45	45
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	324	0	750	317
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1236	-	379	724
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	654	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1236	-	374	724
Mov Cap-2 Maneuver	-	-	-	-	374	-
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	646	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		13.9	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	493	-	-	1236	-	
HCM Lane V/C Ratio	0.184	-	-	0.012	-	
HCM Control Delay (s)	13.9	-	-	7.9	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.7	-	-	0	-	

Timings
14: Monaghan Rd & E. Exposition Ave

2040 Background Traffic
AM Peak Hour

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	133	185	20	75	282	117	24	633	46	610
Future Volume (vph)	133	185	20	75	282	117	24	633	46	610
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	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	23.0	10.0	24.0	10.0	24.0
Total Split (s)	15.0	40.0	40.0	15.0	40.0	40.0	15.0	45.0	20.0	50.0
Total Split (%)	12.5%	33.3%	33.3%	12.5%	33.3%	33.3%	12.5%	37.5%	16.7%	41.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
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	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	None	Max
Act Effect Green (s)	32.8	25.1	25.1	29.1	21.0	21.0	48.1	43.4	49.9	46.0
Actuated g/C Ratio	0.34	0.26	0.26	0.30	0.22	0.22	0.49	0.45	0.51	0.47
v/c Ratio	0.48	0.41	0.04	0.20	0.74	0.28	0.06	0.32	0.12	0.31
Control Delay	27.4	35.0	0.1	22.5	47.8	7.7	13.2	19.6	13.5	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	35.0	0.1	22.5	47.8	7.7	13.2	19.6	13.5	17.5
LOS	C	D	A	C	D	A	B	B	B	B
Approach Delay		29.9			33.9			19.4		17.3
Approach LOS		C			C			B		B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 97.2

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 23.3









Intersection LOS: C

Intersection Capacity Utilization 57.7%

ICU Level of Service B

























Analysis Period (min) 15

Splits and Phases: 14: Monaghan Rd & E. Exposition Ave

			
20 s	45 s	15 s	40 s
			
15 s	50 s	15 s	40 s

Timings
1: Powhaton Rd & Alameda Ave

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)	142	353	124	105	274	97	86	771	161	200	1110	236
Future Volume (vph)	142	353	124	105	274	97	86	771	161	200	1110	236
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	13.0	27.0	27.0	13.0	27.0	27.0	15.0	60.0	60.0	20.0	65.0	65.0
Total Split (%)	10.8%	22.5%	22.5%	10.8%	22.5%	22.5%	12.5%	50.0%	50.0%	16.7%	54.2%	54.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
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	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	25.2	17.2	17.2	24.8	17.0	17.0	64.0	55.2	55.2	71.2	60.9	60.9
Actuated g/C Ratio	0.22	0.15	0.15	0.22	0.15	0.15	0.57	0.49	0.49	0.63	0.54	0.54
v/c Ratio	0.59	0.69	0.37	0.52	0.54	0.30	0.29	0.32	0.20	0.47	0.42	0.26
Control Delay	44.7	52.3	10.3	41.9	48.1	7.9	11.0	18.5	3.4	12.1	17.0	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	52.3	10.3	41.9	48.1	7.9	11.0	18.5	3.4	12.1	17.0	2.7
LOS	D	D	B	D	D	A	B	B	A	B	B	A
Approach Delay		42.1			38.5			15.5			14.2	
Approach LOS		D			D			B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 112.3

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 22.4

Intersection LOS: C

Intersection Capacity Utilization 59.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Powhaton Rd & Alameda Ave

			
20 s	60 s	13 s	27 s
			
15 s	65 s	13 s	27 s































Intersection						
Intersection Delay, s/veh 5.4						
Intersection LOS A						
Approach	EB		WB		NB	SB
Entry Lanes	2		2		1	1
Conflicting Circle Lanes	2		2		2	2
Adj Approach Flow, veh/h	752		443		40	158
Demand Flow Rate, veh/h	767		452		40	161
Vehicles Circulating, veh/h	63		272		781	415
Vehicles Exiting, veh/h	512		549		49	309
Ped Vol Crossing Leg, #/h	0		0		0	0
Ped Cap Adj	1.000		1.000		1.000	1.000
Approach Delay, s/veh	5.4		5.3		5.5	5.2
Approach LOS	A		A		A	A
Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.469	0.531	0.469	0.531	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
Entry Flow, veh/h	360	407	212	240	40	161
Cap Entry Lane, veh/h	1274	1346	1051	1127	731	998
Entry HV Adj Factor	0.982	0.979	0.983	0.979	0.991	0.979
Flow Entry, veh/h	353	399	208	235	40	158
Cap Entry, veh/h	1251	1318	1033	1103	725	977
V/C Ratio	0.283	0.302	0.202	0.213	0.055	0.161
Control Delay, s/veh	5.4	5.4	5.4	5.2	5.5	5.2
LOS	A	A	A	A	A	A
95th %tile Queue, veh	1	1	1	1	0	1

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Vol, veh/h	0	513	390	44	0	31
Future Vol, veh/h	0	513	390	44	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	540	411	46	0	33
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	206
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	-	-	-	0	800
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	800
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		9.7		
HCM LOS	A					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	800		
HCM Lane V/C Ratio	-	-	-	0.041		
HCM Control Delay (s)	-	-	-	9.7		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Timings

4: Monaghan Rd & Alameda Ave

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)	150	246	117	104	219	195	66	539	155	285	862	150
Future Volume (vph)	150	246	117	104	219	195	66	539	155	285	862	150
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	15.0	15.0	10.0	14.0	14.0	10.0	25.0	25.0	10.0	25.0	25.0
Total Split (s)	13.0	25.0	25.0	13.0	25.0	25.0	10.0	47.0	47.0	15.0	52.0	52.0
Total Split (%)	13.0%	25.0%	25.0%	13.0%	25.0%	25.0%	10.0%	47.0%	47.0%	15.0%	52.0%	52.0%
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	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	21.0	13.0	13.0	20.5	13.7	13.7	54.1	47.2	47.2	64.2	54.5	54.5
Actuated g/C Ratio	0.21	0.13	0.13	0.20	0.14	0.14	0.54	0.47	0.47	0.64	0.54	0.54
v/c Ratio	0.61	0.56	0.39	0.42	0.48	0.52	0.18	0.24	0.20	0.52	0.33	0.17
Control Delay	40.9	45.4	9.7	34.0	42.6	10.4	9.1	16.7	3.5	11.7	14.0	2.9
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	40.9	45.4	9.7	34.0	42.6	10.4	9.1	16.7	3.5	11.7	14.0	2.9
LOS	D	D	A	C	D	B	A	B	A	B	B	A
Approach Delay		36.0			28.8			13.4			12.2	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 19.2

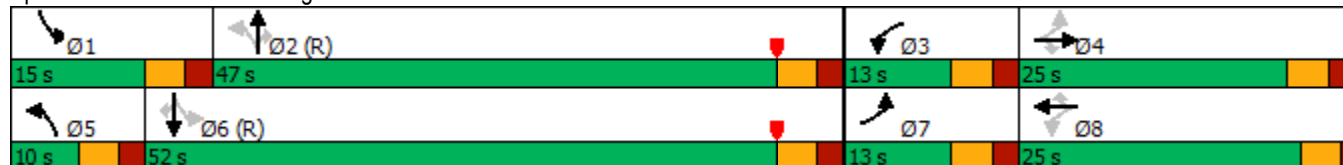
Intersection LOS: B

Intersection Capacity Utilization 64.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Monaghan Rd & Alameda Ave



HCM 6th TWSC
6: Powhaton Rd & Future Access/PA-6 Access

2040 Background Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	954.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	250	10	150	137	10	284	125	484	112	277	813	250
Future Vol, veh/h	250	10	150	137	10	284	125	484	112	277	813	250
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	0	-	0	-	-	250	350	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	263	11	158	144	11	299	132	509	118	292	856	263

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2045	2463	560	1705	2476	255	1119	0	0	627	0	0
Stage 1	1572	1572	-	773	773	-	-	-	-	-	-	-
Stage 2	473	891	-	932	1703	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 60	30	404	~ 97	29	634	343	-	-	590	-	-
Stage 1	~ 79	169	-	286	407	-	-	-	-	-	-	-
Stage 2	494	359	-	259	146	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 11	~ 6	404	-	~ 6	634	343	-	-	590	-	-
Mov Cap-2 Maneuver	~ 11	~ 6	- ~ 119	~ -94	-	-	-	-	-	-	-	-
Stage 1	~ 31	85	- ~ 114	162	-	-	-	-	-	-	-	-
Stage 2	~ 97	143	- ~ 70	74	-	-	-	-	-	-	-	-





Approach	EB	WB	NB	SB
HCM Control Delay, s	6737.7		3.8	3.5
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	343	-	-	11	6	404	-	+	634	590	-	-
HCM Lane V/C Ratio	0.384	-	-	23.923	1.754	0.391	-	-	0.472	0.494	-	-
HCM Control Delay (s)	21.9	-	-	10978.5	1483.6	19.5	-	-	15.6	16.9	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-	C	C	-	-
HCM 95th %tile Q(veh)	1.8	-	-	34.4	2.3	1.8	-	-	2.5	2.7	-	-

Notes												
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined							*: All major volume in platoon			



















HCM 6th TWSC
8: Monaghan Rd & PA-13 Access

2040 Background Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	44	716	16	75	1009
Future Vol, veh/h	9	44	716	16	75	1009
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	350	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	46	754	17	79	1062
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1346	386	0	0	771	0
Stage 1	763	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	*472	523	-	-	504	-
Stage 1	*337	-	-	-	-	-
Stage 2	*723	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	*398	523	-	-	504	-
Mov Cap-2 Maneuver	*398	-	-	-	-	-
Stage 1	*337	-	-	-	-	-
Stage 2	*609	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.2	0		0.9		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	497	504	-	
HCM Lane V/C Ratio	-	-	0.112	0.157	-	
HCM Control Delay (s)	-	-	13.2	13.5	-	
HCM Lane LOS	-	-	B	B	-	
HCM 95th %tile Q(veh)	-	-	0.4	0.6	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Timings
9: Powhatan Rd & E. Exposition Ave

2040 Background Traffic
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	35	5	126	5	10	494	198	300	764
Future Volume (vph)	35	5	126	5	10	494	198	300	764
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	7	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
Minimum Split (s)	10.0	23.0	10.0	23.0	10.0	24.0	24.0	10.0	24.0
Total Split (s)	15.0	25.0	15.0	25.0	15.0	60.0	60.0	20.0	65.0
Total Split (%)	12.5%	20.8%	12.5%	20.8%	12.5%	50.0%	50.0%	16.7%	54.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0
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	6.0	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	9.9	7.2	16.0	9.3	61.4	54.6	54.6	71.9	69.0
Actuated g/C Ratio	0.10	0.07	0.16	0.09	0.62	0.55	0.55	0.73	0.70
v/c Ratio	0.21	0.08	0.50	0.62	0.02	0.19	0.22	0.47	0.24
Control Delay	42.2	35.8	43.1	16.2	6.7	12.8	2.8	8.0	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	35.8	43.1	16.2	6.7	12.8	2.8	8.0	7.0
LOS	D	D	D	B	A	B	A	A	A
Approach Delay		40.9		26.8		9.9			7.3
Approach LOS		D		C		A			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 98.9

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 11.7

Intersection LOS: B

Intersection Capacity Utilization 59.9%

ICU Level of Service B






Analysis Period (min) 15

Splits and Phases: 9: Powhatan Rd & E. Exposition Ave

			
Ø1	Ø2	Ø3	Ø4
20 s	60 s	15 s	25 s
			
Ø5	Ø6	Ø7	Ø8
15 s	65 s	15 s	25 s






HCM 6th TWSC
10: Future PA-8 Access & E. Exposition Ave

2040 Background Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	461	42	28	294	29	21
Future Vol, veh/h	461	42	28	294	29	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	485	44	29	309	31	22
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	529	0	874	507
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	367	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1038	-	320	566
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1038	-	311	566
Mov Cap-2 Maneuver	-	-	-	-	311	-
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	681	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.7		15.9		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	384	-	-	1038	-	
HCM Lane V/C Ratio	0.137	-	-	0.028	-	
HCM Control Delay (s)	15.9	-	-	8.6	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-	

HCM 6th TWSC
11: Future PA-10 Access & E. Exposition Ave






2040 Background Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	444	46	20	301	27	15
Future Vol, veh/h	444	46	20	301	27	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	467	48	21	317	28	16
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	515	0	850	491
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1051	-	331	578
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1051	-	324	578
Mov Cap-2 Maneuver	-	-	-	-	324	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	693	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		15.6	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	384	-	-	1051	-	
HCM Lane V/C Ratio	0.115	-	-	0.02	-	
HCM Control Delay (s)	15.6	-	-	8.5	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-	

Intersection				
Intersection Delay, s/veh	6.3			
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	482	387	133	47
Demand Flow Rate, veh/h	492	395	136	48
Vehicles Circulating, veh/h	134	77	447	431
Vehicles Exiting, veh/h	345	506	179	41
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.2	5.7	5.8	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	492	395	136	48
Cap Entry Lane, veh/h	1204	1276	875	889
Entry HV Adj Factor	0.980	0.980	0.980	0.981
Flow Entry, veh/h	482	387	133	47
Cap Entry, veh/h	1180	1250	857	872
V/C Ratio	0.409	0.310	0.155	0.054
Control Delay, s/veh	7.2	5.7	5.8	4.6
LOS	A	A	A	A
95th %tile Queue, veh	2	1	1	0





















HCM 6th TWSC
13: Future Access & E. Exposition Ave

2040 Background Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	423	49	49	340	29	29
Future Vol, veh/h	423	49	49	340	29	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	445	52	52	358	31	31
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	497	0	933	471
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	462	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1067	-	295	593
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	634	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1067	-	281	593
Mov Cap-2 Maneuver	-	-	-	-	281	-
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	603	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.1		16.2	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	381	-	-	1067	-	
HCM Lane V/C Ratio	0.16	-	-	0.048	-	
HCM Control Delay (s)	16.2	-	-	8.5	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-	

Timings
14: Monaghan Rd & E. Exposition Ave

2040 Background Traffic
PM Peak Hour

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	337	35	76	245	83	32	569	137	771
Future Volume (vph)	80	337	35	76	245	83	32	569	137	771
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	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	23.0	10.0	24.0	10.0	24.0
Total Split (s)	15.0	40.0	40.0	15.0	40.0	40.0	15.0	45.0	20.0	50.0
Total Split (%)	12.5%	33.3%	33.3%	12.5%	33.3%	33.3%	12.5%	37.5%	16.7%	41.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
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	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	None	Max
Act Effect Green (s)	31.2	24.3	24.3	30.9	24.2	24.2	48.1	40.4	56.0	48.8
Actuated g/C Ratio	0.31	0.24	0.24	0.30	0.24	0.24	0.47	0.40	0.55	0.48
v/c Ratio	0.27	0.80	0.08	0.34	0.58	0.19	0.10	0.35	0.34	0.39
Control Delay	24.1	50.9	0.3	25.8	40.6	3.4	14.8	23.5	15.9	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	50.9	0.3	25.8	40.6	3.4	14.8	23.5	15.9	20.3
LOS	C	D	A	C	D	A	B	C	B	C
Approach Delay		42.3			30.2			23.1		19.7
Approach LOS		D			C			C		B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 101.5

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 26.2









Intersection LOS: C

Intersection Capacity Utilization 61.0%

ICU Level of Service B

























Analysis Period (min) 15

Splits and Phases: 14: Monaghan Rd & E. Exposition Ave

			
Ø1	Ø2	Ø3	Ø4
20 s	45 s	15 s	40 s
			
Ø5	Ø6	Ø7	Ø8
15 s	50 s	15 s	40 s

Timings
1: Powhaton Rd & Alameda Ave

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)	216	201	70	114	303	223	131	1155	75	129	706	197
Future Volume (vph)	216	201	70	114	303	223	131	1155	75	129	706	197
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	20.0	25.0	25.0	20.0	25.0	25.0	15.0	55.0	55.0	20.0	60.0	60.0
Total Split (%)	16.7%	20.8%	20.8%	16.7%	20.8%	20.8%	12.5%	45.8%	45.8%	16.7%	50.0%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
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	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	33.2	19.0	19.0	27.0	15.8	15.8	63.8	53.8	53.8	64.5	54.1	54.1
Actuated g/C Ratio	0.29	0.17	0.17	0.24	0.14	0.14	0.56	0.47	0.47	0.56	0.47	0.47
v/c Ratio	0.71	0.36	0.20	0.36	0.65	0.60	0.32	0.51	0.10	0.47	0.31	0.24
Control Delay	45.4	44.8	3.1	32.8	53.4	16.4	12.6	22.8	1.9	16.0	19.6	3.3
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	45.4	44.8	3.1	32.8	53.4	16.4	12.6	22.8	1.9	16.0	19.6	3.3
LOS	D	D	A	C	D	B	B	C	A	B	B	A
Approach Delay		39.0			36.9			20.7			16.1	
Approach LOS		D			D			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.3

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 24.8


Intersection LOS: C

Intersection Capacity Utilization 67.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Powhaton Rd & Alameda Ave













			
20 s	55 s	20 s	25 s
			
15 s	60 s	20 s	25 s

Queues

1: Powhaton Rd & Alameda Ave

2040 Total Traffic

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	212	74	120	319	235	138	1216	79	136	743	207
v/c Ratio	0.71	0.36	0.20	0.36	0.65	0.60	0.32	0.51	0.10	0.47	0.31	0.24
Control Delay	45.4	44.8	3.1	32.8	53.4	16.4	12.6	22.8	1.9	16.0	19.6	3.3
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	45.4	44.8	3.1	32.8	53.4	16.4	12.6	22.8	1.9	16.0	19.6	3.3
Queue Length 50th (ft)	133	74	0	66	120	22	42	227	0	42	124	0
Queue Length 95th (ft)	#214	116	13	114	168	100	77	300	15	76	164	43
Internal Link Dist (ft)	899			2750			1293			1241		
Turn Bay Length (ft)	350		250	350		250	350		250	350		250
Base Capacity (vph)	326	625	377	392	620	444	449	2392	802	375	2408	858
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	0.70	0.34	0.20	0.31	0.51	0.53	0.31	0.51	0.10	0.36	0.31	0.24

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM 6th Roundabout
2: Trussville Rd & Alameda Ave

2040 Total Traffic
AM Peak Hour

Intersection						
Intersection Delay, s/veh 5.6						
Intersection LOS A						
Approach	EB		WB		NB	SB
Entry Lanes	2		2		1	1
Conflicting Circle Lanes	2		2		2	2
Adj Approach Flow, veh/h	428		533		202	241
Demand Flow Rate, veh/h	437		543		206	246
Vehicles Circulating, veh/h	146		241		459	587
Vehicles Exiting, veh/h	687		424		124	197
Ped Vol Crossing Leg, #/h	0		0		0	0
Ped Cap Adj	1.000		1.000		1.000	1.000
Approach Delay, s/veh	4.6		5.5		5.9	7.4
Approach LOS	A		A		A	A
Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.469	0.531	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
Entry Flow, veh/h	205	232	255	288	206	246
Cap Entry Lane, veh/h	1180	1254	1081	1157	961	862
Entry HV Adj Factor	0.982	0.979	0.982	0.980	0.981	0.980
Flow Entry, veh/h	201	227	250	282	202	241
Cap Entry, veh/h	1159	1228	1062	1134	943	845
V/C Ratio	0.174	0.185	0.236	0.249	0.214	0.285
Control Delay, s/veh	4.6	4.5	5.6	5.5	5.9	7.4
LOS	A	A	A	A	A	A
95th %tile Queue, veh	1	1	1	1	1	1

























HCM 6th TWSC
3: Waterloo St & Alameda Ave

2040 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑			↑			↑
Traffic Vol, veh/h	0	382	12	0	458	12	0	0	12	0	0	47
Future Vol, veh/h	0	382	12	0	458	12	0	0	12	0	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	402	13	0	482	13	0	0	13	0	0	49
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	201	-	-	241
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	806	0	0	760
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	806	-	-	760
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			9.5			10.1		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1						
Capacity (veh/h)	806	-	-	-	-	760						
HCM Lane V/C Ratio	0.016	-	-	-	-	0.065						
HCM Control Delay (s)	9.5	-	-	-	-	10.1						
HCM Lane LOS	A	-	-	-	-	B						
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2						

Timings 4: Monaghan Rd & Alameda Ave

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)	150	193	52	145	272	279	85	829	99	175	585	113
Future Volume (vph)	150	193	52	145	272	279	85	829	99	175	585	113
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	15.0	15.0	10.0	14.0	14.0	10.0	25.0	25.0	10.0	25.0	25.0
Total Split (s)	12.0	25.0	25.0	12.0	25.0	25.0	10.0	48.0	48.0	15.0	53.0	53.0
Total Split (%)	12.0%	25.0%	25.0%	12.0%	25.0%	25.0%	10.0%	48.0%	48.0%	15.0%	53.0%	53.0%
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	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	21.0	14.0	14.0	21.0	15.0	15.0	56.4	49.8	49.8	62.3	54.6	54.6
Actuated g/C Ratio	0.21	0.14	0.14	0.21	0.15	0.15	0.56	0.50	0.50	0.62	0.55	0.55
v/c Ratio	0.68	0.41	0.16	0.54	0.54	0.73	0.18	0.34	0.12	0.44	0.22	0.13
Control Delay	45.5	40.8	1.1	37.6	42.5	25.1	9.0	16.4	2.1	11.5	13.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	40.8	1.1	37.6	42.5	25.1	9.0	16.4	2.1	11.5	13.1	2.5
LOS	D	D	A	D	D	C	A	B	A	B	B	A
Approach Delay		37.4			34.5			14.4			11.4	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 21.3

Intersection LOS: C

Intersection Capacity Utilization 58.9%

ICU Level of Service B













Analysis Period (min) 15

Splits and Phases: 4: Monaghan Rd & Alameda Ave






Queues
4: Monaghan Rd & Alameda Ave

2040 Total Traffic
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	203	55	153	286	294	89	873	104	184	616	119
v/c Ratio	0.68	0.41	0.16	0.54	0.54	0.73	0.18	0.34	0.12	0.44	0.22	0.13
Control Delay	45.5	40.8	1.1	37.6	42.5	25.1	9.0	16.4	2.1	11.5	13.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	40.8	1.1	37.6	42.5	25.1	9.0	16.4	2.1	11.5	13.1	2.5
Queue Length 50th (ft)	83	63	0	80	90	59	19	117	0	42	74	0
Queue Length 95th (ft)	128	91	0	124	123	143	45	171	20	85	106	24
Internal Link Dist (ft)	839			1252			1147			991		
Turn Bay Length (ft)	450		250	450		250	450		250	450		250
Base Capacity (vph)	234	707	421	282	743	485	494	2533	854	431	2774	923
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	0.68	0.29	0.13	0.54	0.38	0.61	0.18	0.34	0.12	0.43	0.22	0.13
Intersection Summary												

HCM 6th TWSC
5: Trussville Rd & PA-11 North Access

2040 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	3	11	181	1	4	111
Future Vol, veh/h	3	11	181	1	4	111
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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	12	191	1	4	117

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	317	192	0	0	192
Stage 1	192	-	-	-	-
Stage 2	125	-	-	-	-
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	676	850	-	-	1381
Stage 1	841	-	-	-	-
Stage 2	901	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	674	850	-	-	1381
Mov Cap-2 Maneuver	674	-	-	-	-
Stage 1	841	-	-	-	-
Stage 2	898	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	805	1381
HCM Lane V/C Ratio	-	-	0.018	0.003
HCM Control Delay (s)	-	-	9.6	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
6: Powhatan Rd & Future Access/PA-6 Access

2040 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	20.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑↑	↱	↰	↑↑↑	↱
Traffic Vol, veh/h	75	5	50	30	5	114	50	1172	47	118	673	100
Future Vol, veh/h	75	5	50	30	5	114	50	1172	47	118	673	100
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	0	-	0	0	-	250	350	-	0
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	79	5	53	32	5	120	53	1234	49	124	708	105

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1558	2345	354	1874	2401	617	813	0	0	1283	0	0
Stage 1	956	956	-	1340	1340	-	-	-	-	-	-	-
Stage 2	602	1389	-	534	1061	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	119	36	548	76	33	371	481	-	-	285	-	-
Stage 1	214	335	-	115	220	-	-	-	-	-	-	-
Stage 2	413	208	-	454	299	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 47	18	548	33	17	371	481	-	-	285	-	-
Mov Cap-2 Maneuver	~ 47	18	-	72	74	-	-	-	-	-	-	-
Stage 1	190	189	-	102	196	-	-	-	-	-	-	-
Stage 2	242	185	-	225	169	-	-	-	-	-	-	-

























Approach	EB		WB		NB			SB				
HCM Control Delay, s	\$ 315		34.7		0.5			3.6				
HCM LOS	F		D									

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	481	-	-	47	18	548	72	74	371	285	-	-
HCM Lane V/C Ratio	0.109	-	-	1.68	0.292	0.096	0.439	0.071	0.323	0.436	-	-
HCM Control Delay (s)	13.4	-	-	\$ 519.6	273.1	12.3	89.4	57.3	19.3	27	-	-
HCM Lane LOS	B	-	-	F	F	B	F	F	C	D	-	-
HCM 95th %tile Q(veh)	0.4	-	-	7.8	0.8	0.3	1.7	0.2	1.4	2.1	-	-

Notes												
~: Volume exceeds capacity	\$: Delay exceeds 300s		+: Computation Not Defined			*: All major volume in platoon						

Timings
6: Powhaton Rd & Future Access/PA-6 Access

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)	75	5	50	30	5	114	50	1172	47	118	673	100
Future Volume (vph)	75	5	50	30	5	114	50	1172	47	118	673	100
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	20.0	25.0	25.0	20.0	25.0	25.0	15.0	60.0	60.0	15.0	60.0	60.0
Total Split (%)	16.7%	20.8%	20.8%	16.7%	20.8%	20.8%	12.5%	50.0%	50.0%	12.5%	50.0%	50.0%
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	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	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	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	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	18.0	11.5	11.5	12.6	7.0	7.0	62.6	56.1	56.1	66.2	59.8	59.8
Actuated g/C Ratio	0.18	0.12	0.12	0.13	0.07	0.07	0.64	0.57	0.57	0.68	0.61	0.61
v/c Ratio	0.31	0.02	0.19	0.15	0.04	0.54	0.10	0.42	0.05	0.37	0.23	0.10
Control Delay	35.3	41.2	1.5	32.9	44.8	18.0	6.7	13.6	0.1	9.3	10.7	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	41.2	1.5	32.9	44.8	18.0	6.7	13.6	0.1	9.3	10.7	2.6
LOS	D	D	A	C	D	B	A	B	A	A	B	A
Approach Delay		22.4			21.9			12.8			9.6	
Approach LOS		C			C			B			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 97.8

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 12.7

Intersection LOS: B

Intersection Capacity Utilization 52.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: Powhaton Rd & Future Access/PA-6 Access













			
Ø1	Ø2	Ø3	Ø4
15 s	60 s	20 s	25 s
			
Ø5	Ø6	Ø7	Ø8
15 s	60 s	20 s	25 s

Queues

2040 Total Traffic

6: Powhaton Rd & Future Access/PA-6 Access

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	79	5	53	32	5	120	53	1234	49	124	708	105
v/c Ratio	0.31	0.02	0.19	0.15	0.04	0.54	0.10	0.42	0.05	0.37	0.23	0.10
Control Delay	35.3	41.2	1.5	32.9	44.8	18.0	6.7	13.6	0.1	9.3	10.7	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	41.2	1.5	32.9	44.8	18.0	6.7	13.6	0.1	9.3	10.7	2.6
Queue Length 50th (ft)	41	3	0	16	3	0	9	152	0	22	73	0
Queue Length 95th (ft)	82	14	1	41	15	55	27	238	0	54	121	24
Internal Link Dist (ft)	453			317			1188			1293		
Turn Bay Length (ft)							250			350		
Base Capacity (vph)	331	383	412	348	383	421	578	2915	954	369	3107	1009
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	0.24	0.01	0.13	0.09	0.01	0.29	0.09	0.42	0.05	0.34	0.23	0.10
Intersection Summary												

HCM 6th TWSC
7: Trussville Rd & PA-7 Access/PA-11 South Access

2040 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	68	4	9	15	1	32	3	82	5	7	85	22
Future Vol, veh/h	68	4	9	15	1	32	3	82	5	7	85	22
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	72	4	9	16	1	34	3	86	5	7	89	23

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	227	212	101	216	221	89	112	0	0	91	0	0
Stage 1	115	115	-	95	95	-	-	-	-	-	-	-
Stage 2	112	97	-	121	126	-	-	-	-	-	-	-
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	728	685	954	740	678	969	1478	-	-	1504	-	-
Stage 1	890	800	-	912	816	-	-	-	-	-	-	-
Stage 2	893	815	-	883	792	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	698	680	954	725	673	969	1478	-	-	1504	-	-
Mov Cap-2 Maneuver	698	680	-	725	673	-	-	-	-	-	-	-
Stage 1	888	796	-	910	814	-	-	-	-	-	-	-
Stage 2	859	813	-	865	788	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.7		9.4		0.2		0.5	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1478	-	-	718	870	1504	-
HCM Lane V/C Ratio	0.002	-	-	0.119	0.058	0.005	-
HCM Control Delay (s)	7.4	0	-	10.7	9.4	7.4	0
HCM Lane LOS	A	A	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.2	0	-

HCM 6th TWSC
8: Monaghan Rd & PA-12 Access/PA-13 Access

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	49	0	10	14	0	65	2	899	5	22	740	20
Future Vol, veh/h	49	0	10	14	0	65	2	899	5	22	740	20
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	150	-	-	150	-	-	350	-	-	350	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	52	0	11	15	0	68	2	946	5	23	779	21

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1218	1791	400	1311	1799	476	800	0	0	951	0	0
Stage 1	836	836	-	953	953	-	-	-	-	-	-	-
Stage 2	382	955	-	358	846	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	398	148	*756	*344	147	458	939	-	-	413	-	-
Stage 1	713	699	-	*215	336	-	-	-	-	-	-	-
Stage 2	561	335	-	*776	689	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	324	140	*756	*324	138	458	939	-	-	413	-	-
Mov Cap-2 Maneuver	324	140	-	*324	138	-	-	-	-	-	-	-
Stage 1	711	659	-	*215	335	-	-	-	-	-	-	-
Stage 2	476	334	-	*723	651	-	-	-	-	-	-	-



















Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.8		14.6		0		0.4	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	939	-	-	324	756	324	458	413	-	-
HCM Lane V/C Ratio	0.002	-	-	0.159	0.014	0.045	0.149	0.056	-	-
HCM Control Delay (s)	8.8	-	-	18.2	9.8	16.6	14.2	14.2	-	-
HCM Lane LOS	A	-	-	C	A	C	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	0.1	0.5	0.2	-	-

Notes												
~: Volume exceeds capacity			\$: Delay exceeds 300s			+: Computation Not Defined			*: All major volume in platoon			

Timings
9: Powhatan Rd & E. Exposition Ave

2040 Total Traffic
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	25	5	225	5	5	899	90	184	549
Future Volume (vph)	25	5	225	5	5	899	90	184	549
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	7	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
Minimum Split (s)	10.0	23.0	10.0	23.0	10.0	24.0	24.0	10.0	24.0
Total Split (s)	15.0	25.0	15.0	25.0	15.0	60.0	60.0	20.0	65.0
Total Split (%)	12.5%	20.8%	12.5%	20.8%	12.5%	50.0%	50.0%	16.7%	54.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0
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	6.0	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	10.2	8.1	19.3	12.9	61.5	54.8	54.8	70.5	67.6
Actuated g/C Ratio	0.10	0.08	0.19	0.13	0.61	0.54	0.54	0.70	0.67
v/c Ratio	0.14	0.07	0.76	0.76	0.01	0.34	0.10	0.44	0.18
Control Delay	40.8	34.9	54.4	18.8	8.0	15.0	2.8	9.9	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	34.9	54.4	18.8	8.0	15.0	2.8	9.9	8.1
LOS	D	C	D	B	A	B	A	A	A
Approach Delay		39.2		32.7		13.9			8.5
Approach LOS		D		C		B			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 100.6

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 17.1


Intersection LOS: B

Intersection Capacity Utilization 62.6%

ICU Level of Service B










Analysis Period (min) 15

Splits and Phases: 9: Powhatan Rd & E. Exposition Ave

			
20 s	60 s	15 s	25 s
			
15 s	65 s	15 s	25 s

Queues
9: Powhatan Rd & E. Exposition Ave

2040 Total Traffic
AM Peak Hour







									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	26	10	237	369	5	946	95	194	599
v/c Ratio	0.14	0.07	0.76	0.76	0.01	0.34	0.10	0.44	0.18
Control Delay	40.8	34.9	54.4	18.8	8.0	15.0	2.8	9.9	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	34.9	54.4	18.8	8.0	15.0	2.8	9.9	8.1
Queue Length 50th (ft)	16	3	140	27	1	123	0	40	46
Queue Length 95th (ft)	37	20	#260	133	6	207	24	91	108
Internal Link Dist (ft)		899		736		1040			1188
Turn Bay Length (ft)	350		250		350		250	250	
Base Capacity (vph)	238	351	310	579	607	2770	912	514	3400
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	0.03	0.76	0.64	0.01	0.34	0.10	0.38	0.18

Intersection Summary

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

HCM 6th TWSC
10: Future PA-8 Access/PA-5 Access & E. Exposition Ave

2040 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	252	18	13	518	9	29	0	24	19	0	29
Future Vol, veh/h	9	252	18	13	518	9	29	0	24	19	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	265	19	14	545	9	31	0	25	20	0	31







Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	554	0	0	284	0	0	886	875	275	883	880	550
Stage 1	-	-	-	-	-	-	293	293	-	578	578	-
Stage 2	-	-	-	-	-	-	593	582	-	305	302	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1016	-	-	1278	-	-	265	288	764	266	286	535
Stage 1	-	-	-	-	-	-	715	670	-	501	501	-
Stage 2	-	-	-	-	-	-	492	499	-	705	664	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1016	-	-	1278	-	-	246	282	764	253	280	535
Mov Cap-2 Maneuver	-	-	-	-	-	-	246	282	-	253	280	-
Stage 1	-	-	-	-	-	-	709	664	-	496	495	-
Stage 2	-	-	-	-	-	-	459	494	-	676	658	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.2			17			16.2		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	355	1016	-	-	1278	-	-	371
HCM Lane V/C Ratio	0.157	0.009	-	-	0.011	-	-	0.136
HCM Control Delay (s)	17	8.6	-	-	7.8	-	-	16.2
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.5

HCM 6th TWSC
11: Future PA-10 Access/PA-7 Access & E. Exposition Ave

2040 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	271	17	31	475	4	40	0	39	11	1	24
Future Vol, veh/h	8	271	17	31	475	4	40	0	39	11	1	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	285	18	33	500	4	42	0	41	12	1	25
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	504	0	0	303	0	0	891	880	294	899	887	502
Stage 1	-	-	-	-	-	-	310	310	-	568	568	-
Stage 2	-	-	-	-	-	-	581	570	-	331	319	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1061	-	-	1258	-	-	263	286	745	260	283	569
Stage 1	-	-	-	-	-	-	700	659	-	508	506	-
Stage 2	-	-	-	-	-	-	499	505	-	682	653	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1061	-	-	1258	-	-	244	276	745	239	273	569
Mov Cap-2 Maneuver	-	-	-	-	-	-	244	276	-	239	273	-
Stage 1	-	-	-	-	-	-	694	654	-	504	493	-
Stage 2	-	-	-	-	-	-	463	492	-	640	648	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.5			17.7			15.2		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	365	1061	-	-	1258	-	-	392				
HCM Lane V/C Ratio	0.228	0.008	-	-	0.026	-	-	0.097				
HCM Control Delay (s)	17.7	8.4	-	-	7.9	-	-	15.2				
HCM Lane LOS	C	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	0.3				







HCM 6th Roundabout
12: Trussville Rd & E. Exposition Ave

2040 Total Traffic
AM Peak Hour

Intersection				
Intersection Delay, s/veh	7.2			
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	338	514	302	116
Demand Flow Rate, veh/h	345	524	308	118
Vehicles Circulating, veh/h	197	198	263	625
Vehicles Exiting, veh/h	546	373	279	97
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	8.4	6.4	6.8
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	345	524	308	118
Cap Entry Lane, veh/h	1129	1128	1055	729
Entry HV Adj Factor	0.980	0.980	0.982	0.985
Flow Entry, veh/h	338	514	302	116
Cap Entry, veh/h	1107	1105	1036	718
V/C Ratio	0.306	0.465	0.292	0.162
Control Delay, s/veh	6.2	8.4	6.4	6.8
LOS	A	A	A	A
95th %tile Queue, veh	1	3	1	1





















HCM 6th TWSC
13: Future Access/PA-12 Access & E. Exposition Ave

2040 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	324	14	14	397	6	43	0	43	17	0	49
Future Vol, veh/h	10	324	14	14	397	6	43	0	43	17	0	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	341	15	15	418	6	45	0	45	18	0	52
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	424	0	0	356	0	0	848	825	349	844	829	421
Stage 1	-	-	-	-	-	-	371	371	-	451	451	-
Stage 2	-	-	-	-	-	-	477	454	-	393	378	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1135	-	-	1203	-	-	281	308	694	283	306	632
Stage 1	-	-	-	-	-	-	649	620	-	588	571	-
Stage 2	-	-	-	-	-	-	569	569	-	632	615	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1135	-	-	1203	-	-	254	301	694	260	299	632
Mov Cap-2 Maneuver	-	-	-	-	-	-	254	301	-	260	299	-
Stage 1	-	-	-	-	-	-	643	614	-	582	564	-
Stage 2	-	-	-	-	-	-	516	562	-	585	609	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.3			17.8			14.2		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	372	1135	-	-	1203	-	-	462				
HCM Lane V/C Ratio	0.243	0.009	-	-	0.012	-	-	0.15				
HCM Control Delay (s)	17.8	8.2	-	-	8	-	-	14.2				
HCM Lane LOS	C	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	0.5				

Timings
14: Monaghan Rd & E. Exposition Ave

2040 Total Traffic
AM Peak Hour

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	154	193	37	75	285	117	30	634	46	615
Future Volume (vph)	154	193	37	75	285	117	30	634	46	615
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	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	23.0	10.0	24.0	10.0	24.0
Total Split (s)	15.0	40.0	40.0	15.0	40.0	40.0	15.0	45.0	20.0	50.0
Total Split (%)	12.5%	33.3%	33.3%	12.5%	33.3%	33.3%	12.5%	37.5%	16.7%	41.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
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	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	None	Max
Act Effect Green (s)	33.2	25.5	25.5	29.6	21.3	21.3	49.5	43.2	51.2	45.9
Actuated g/C Ratio	0.33	0.26	0.26	0.30	0.21	0.21	0.50	0.43	0.51	0.46
v/c Ratio	0.57	0.43	0.08	0.21	0.76	0.28	0.08	0.33	0.12	0.33
Control Delay	31.3	36.4	0.3	23.4	50.1	7.9	13.3	20.7	13.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	36.4	0.3	23.4	50.1	7.9	13.3	20.7	13.5	18.9
LOS	C	D	A	C	D	A	B	C	B	B
Approach Delay		30.9			35.5			20.4		18.5
Approach LOS		C			D			C		B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 100

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 24.6









Intersection LOS: C

Intersection Capacity Utilization 59.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 14: Monaghan Rd & E. Exposition Ave

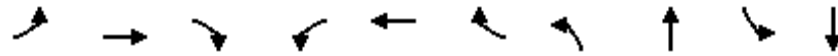
			
Ø1	Ø2	Ø3	Ø4
20 s	45 s	15 s	40 s
			
Ø5	Ø6	Ø7	Ø8
15 s	50 s	15 s	40 s

Queues

14: Monaghan Rd & E. Exposition Ave

2040 Total Traffic

























AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	162	203	39	79	300	123	32	719	48	754
v/c Ratio	0.57	0.43	0.08	0.21	0.76	0.28	0.08	0.33	0.12	0.33
Control Delay	31.3	36.4	0.3	23.4	50.1	7.9	13.3	20.7	13.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	36.4	0.3	23.4	50.1	7.9	13.3	20.7	13.5	18.9
Queue Length 50th (ft)	75	117	0	35	187	1	9	112	14	114
Queue Length 95th (ft)	126	192	0	68	285	46	28	172	38	175
Internal Link Dist (ft)		886			1402			1165		1345
Turn Bay Length (ft)	150		150	150		150	350		350	
Base Capacity (vph)	290	661	638	408	661	640	437	2181	498	2303
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	0.56	0.31	0.06	0.19	0.45	0.19	0.07	0.33	0.10	0.33
Intersection Summary										

Timings
1: Powhaton Rd & Alameda Ave

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)	142	386	136	105	289	118	98	826	169	249	1193	236
Future Volume (vph)	142	386	136	105	289	118	98	826	169	249	1193	236
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	13.0	27.0	27.0	13.0	27.0	27.0	15.0	60.0	60.0	20.0	65.0	65.0
Total Split (%)	10.8%	22.5%	22.5%	10.8%	22.5%	22.5%	12.5%	50.0%	50.0%	16.7%	54.2%	54.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
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	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	26.2	18.1	18.1	25.8	18.0	18.0	64.1	55.0	55.0	72.5	59.3	59.3
Actuated g/C Ratio	0.23	0.16	0.16	0.23	0.16	0.16	0.56	0.48	0.48	0.63	0.52	0.52
v/c Ratio	0.60	0.72	0.39	0.54	0.55	0.35	0.36	0.36	0.21	0.59	0.48	0.26
Control Delay	45.2	53.8	10.0	43.1	48.4	10.2	12.7	19.8	3.4	15.0	18.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	53.8	10.0	43.1	48.4	10.2	12.7	19.8	3.4	15.0	18.9	2.8
LOS	D	D	B	D	D	B	B	B	A	B	B	A
Approach Delay		43.0			38.5			16.6			16.1	
Approach LOS		D			D			B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.4

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 23.7


Intersection LOS: C

Intersection Capacity Utilization 63.7%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Powhaton Rd & Alameda Ave













			
20 s	60 s	13 s	27 s
			
15 s	65 s	13 s	27 s

Queues

1: Powhaton Rd & Alameda Ave

2040 Total Traffic

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	406	143	111	304	124	103	869	178	262	1256	248
v/c Ratio	0.60	0.72	0.39	0.54	0.55	0.35	0.36	0.36	0.21	0.59	0.48	0.26
Control Delay	45.2	53.8	10.0	43.1	48.4	10.2	12.7	19.8	3.4	15.0	18.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	53.8	10.0	43.1	48.4	10.2	12.7	19.8	3.4	15.0	18.9	2.8
Queue Length 50th (ft)	87	151	0	63	109	0	27	143	0	75	209	0
Queue Length 95th (ft)	147	209	56	113	157	52	53	195	40	126	275	42
Internal Link Dist (ft)	899		2750				1293				1241	
Turn Bay Length (ft)	350	250		350	250		350	250		350	250	
Base Capacity (vph)	248	682	420	209	682	405	316	2445	853	475	2635	939
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	0.60	0.60	0.34	0.53	0.45	0.31	0.33	0.36	0.21	0.55	0.48	0.26
Intersection Summary												

HCM 6th Roundabout
2: Trussville Rd & Alameda Ave

2040 Total Traffic
PM Peak Hour

Intersection						
Intersection Delay, s/veh 6.2						
Intersection LOS A						
Approach	EB		WB		NB	SB
Entry Lanes	2		2		1	1
Conflicting Circle Lanes	2		2		2	2
Adj Approach Flow, veh/h	846		515		119	161
Demand Flow Rate, veh/h	863		526		121	164
Vehicles Circulating, veh/h	139		311		831	525
Vehicles Exiting, veh/h	550		641		171	312
Ped Vol Crossing Leg, #/h	0		0		0	0
Ped Cap Adj	1.000		1.000		1.000	1.000
Approach Delay, s/veh	6.4		5.9		7.2	5.8
Approach LOS	A		A		A	A
Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.470	0.530	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
Entry Flow, veh/h	406	457	247	279	121	164
Cap Entry Lane, veh/h	1188	1262	1014	1090	701	909
Entry HV Adj Factor	0.979	0.981	0.981	0.979	0.980	0.980
Flow Entry, veh/h	398	448	242	273	119	161
Cap Entry, veh/h	1163	1238	994	1067	687	890
V/C Ratio	0.342	0.362	0.244	0.256	0.173	0.180
Control Delay, s/veh	6.4	6.4	6.0	5.8	7.2	5.8
LOS	A	A	A	A	A	A
95th %tile Queue, veh	2	2	1	1	1	1

























HCM 6th TWSC
3: Waterloo St & Alameda Ave

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗			↗			↗
Traffic Vol, veh/h	0	555	41	0	458	44	0	0	8	0	0	31
Future Vol, veh/h	0	555	41	0	458	44	0	0	8	0	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	250	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	584	43	0	482	46	0	0	8	0	0	33
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	292	-	-	241
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	704	0	0	760
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	704	-	-	760
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			10.2			9.9		
HCM LOS							B			A		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1						
Capacity (veh/h)	704	-	-	-	-	760						
HCM Lane V/C Ratio	0.012	-	-	-	-	0.043						
HCM Control Delay (s)	10.2	-	-	-	-	9.9						
HCM Lane LOS	B	-	-	-	-	A						
HCM 95th %tile Q(veh)	0	-	-	-	-	0.1						

Timings 4: Monaghan Rd & Alameda Ave

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)	185	258	121	125	235	195	68	575	165	285	934	199
Future Volume (vph)	185	258	121	125	235	195	68	575	165	285	934	199
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	15.0	15.0	10.0	14.0	14.0	10.0	25.0	25.0	10.0	25.0	25.0
Total Split (s)	13.0	25.0	25.0	13.0	25.0	25.0	10.0	47.0	47.0	15.0	52.0	52.0
Total Split (%)	13.0%	25.0%	25.0%	13.0%	25.0%	25.0%	10.0%	47.0%	47.0%	15.0%	52.0%	52.0%
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	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	21.2	13.2	13.2	21.0	14.1	14.1	53.7	46.9	46.9	63.8	54.1	54.1
Actuated g/C Ratio	0.21	0.13	0.13	0.21	0.14	0.14	0.54	0.47	0.47	0.64	0.54	0.54
v/c Ratio	0.76	0.58	0.39	0.51	0.49	0.51	0.20	0.25	0.21	0.54	0.36	0.22
Control Delay	51.1	45.6	10.1	36.7	42.6	10.2	9.5	17.1	3.5	12.3	14.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	45.6	10.1	36.7	42.6	10.2	9.5	17.1	3.5	12.3	14.6	2.7
LOS	D	D	B	D	D	B	A	B	A	B	B	A
Approach Delay		39.8			29.9			13.7			12.4	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 55 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 20.2

Intersection LOS: C

Intersection Capacity Utilization 66.9%

ICU Level of Service C













Analysis Period (min) 15

Splits and Phases: 4: Monaghan Rd & Alameda Ave



Queues
4: Monaghan Rd & Alameda Ave

2040 Total Traffic
PM Peak Hour




												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	195	272	127	132	247	205	72	605	174	300	983	209
v/c Ratio	0.76	0.58	0.39	0.51	0.49	0.51	0.20	0.25	0.21	0.54	0.36	0.22
Control Delay	51.1	45.6	10.1	36.7	42.6	10.2	9.5	17.1	3.5	12.3	14.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	45.6	10.1	36.7	42.6	10.2	9.5	17.1	3.5	12.3	14.6	2.7
Queue Length 50th (ft)	104	87	0	67	77	0	16	83	0	75	130	0
Queue Length 95th (ft)	#165	123	47	112	111	60	36	119	39	133	180	38
Internal Link Dist (ft)	839			1252			1147			991		
Turn Bay Length (ft)	450		250	450		250	450		250	450		250
Base Capacity (vph)	257	707	421	259	743	494	362	2382	834	556	2751	952
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.38	0.30	0.51	0.33	0.41	0.20	0.25	0.21	0.54	0.36	0.22

Intersection Summary

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

HCM 6th TWSC
5: Trussville Rd & PA-11 North Access

2040 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	105	3	13	146
Future Vol, veh/h	2	8	105	3	13	146
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	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	111	3	14	154
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	295	113	0	0	114	0
Stage 1	113	-	-	-	-	-
Stage 2	182	-	-	-	-	-
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	696	940	-	-	1475	-
Stage 1	912	-	-	-	-	-
Stage 2	849	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	689	940	-	-	1475	-
Mov Cap-2 Maneuver	689	-	-	-	-	-
Stage 1	912	-	-	-	-	-
Stage 2	841	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.2	0		0.6		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		876	1475	
HCM Lane V/C Ratio	-	-		0.012	0.009	
HCM Control Delay (s)	-	-		9.2	7.5	
HCM Lane LOS	-	-		A	A	
HCM 95th %tile Q(veh)	-	-		0	0	

























HCM 6th TWSC
6: Powhaton Rd & Future Access/PA-6 Access

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	1105.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑↑	↱	↰	↑↑↑	↱
Traffic Vol, veh/h	250	10	150	139	10	319	125	524	118	337	848	250
Future Vol, veh/h	250	10	150	139	10	319	125	524	118	337	848	250
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	0	-	0	350	-	250	350	-	250
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	263	11	158	146	11	336	132	552	124	355	893	263
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2093	2543	447	1889	2682	276	1156	0	0	676	0	0
Stage 1	1603	1603	-	816	816	-	-	-	-	-	-	-
Stage 2	490	940	-	1073	1866	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 56	27	478	~ 74	22	615	329	-	-	559	-	-
Stage 1	~ 75	163	-	267	389	-	-	-	-	-	-	-
Stage 2	483	340	-	212	121	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 9	~ 6	478	-	~ 5	615	329	-	-	559	-	-
Mov Cap-2 Maneuver	~ 9	~ 6	- ~ -178	~ -139		-	-	-	-	-	-	-
Stage 1	~ 45	59	-	160	233	-	-	-	-	-	-	-
Stage 2	~ 125	204	-	~ 43	44	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	8282.6				3.8		5.2					
HCM LOS	F		-									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	329	-	-	9	6	478	-	+	615	559	-	-
HCM Lane V/C Ratio	0.4	-	-	29.24	1.754	0.33	-	-	0.546	0.635	-	-
HCM Control Delay (s)	23	-	-	13514.8	1483.6	16.2	-	-	17.7	22	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-	C	C	-	-
HCM 95th %tile Q(veh)	1.9	-	-	34.6	2.3	1.4	-	-	3.3	4.4	-	-
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

Timings
6: Powhaton Rd & Future Access/PA-6 Access

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)	250	10	150	139	10	319	125	524	118	337	848	250
Future Volume (vph)	250	10	150	139	10	319	125	524	118	337	848	250
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	5.0
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	20.0	25.0	25.0	20.0	25.0	25.0	15.0	60.0	60.0	15.0	60.0	60.0
Total Split (%)	16.7%	20.8%	20.8%	16.7%	20.8%	20.8%	12.5%	50.0%	50.0%	12.5%	50.0%	50.0%
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	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	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	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	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	26.0	11.3	11.3	21.1	8.9	8.9	63.5	55.1	55.1	66.8	56.8	56.8
Actuated g/C Ratio	0.24	0.10	0.10	0.19	0.08	0.08	0.58	0.51	0.51	0.61	0.52	0.52
v/c Ratio	0.75	0.06	0.52	0.47	0.07	0.77	0.33	0.21	0.14	0.63	0.34	0.28
Control Delay	49.1	44.7	13.5	37.2	45.6	17.4	10.8	15.7	3.4	16.7	16.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	44.7	13.5	37.2	45.6	17.4	10.8	15.7	3.4	16.7	16.3	2.9
LOS	D	D	B	D	D	B	B	B	A	B	B	A
Approach Delay		36.0			23.9			13.0			14.0	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 108.7

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 18.2









Intersection LOS: B

Intersection Capacity Utilization 61.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Powhaton Rd & Future Access/PA-6 Access













			
Ø1	Ø2	Ø3	Ø4
15 s	60 s	20 s	25 s
			
Ø5	Ø6	Ø7	Ø8
15 s	60 s	20 s	25 s

Queues

2040 Total Traffic

6: Powhaton Rd & Future Access/PA-6 Access

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	263	11	158	146	11	336	132	552	124	355	893	263
v/c Ratio	0.75	0.06	0.52	0.47	0.07	0.77	0.33	0.21	0.14	0.63	0.34	0.28
Control Delay	49.1	44.7	13.5	37.2	45.6	17.4	10.8	15.7	3.4	16.7	16.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	44.7	13.5	37.2	45.6	17.4	10.8	15.7	3.4	16.7	16.3	2.9
Queue Length 50th (ft)	159	7	0	82	7	0	30	71	0	93	119	0
Queue Length 95th (ft)	240	25	60	136	25	86	71	116	33	190	192	45
Internal Link Dist (ft)		341			317			1188			1293	
Turn Bay Length (ft)							350		250	350		250
Base Capacity (vph)	355	343	420	358	343	565	426	2577	863	561	2655	952
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	0.74	0.03	0.38	0.41	0.03	0.59	0.31	0.21	0.14	0.63	0.34	0.28
Intersection Summary												

HCM 6th TWSC
7: Trussville Rd & PA-7 Access/PA-11 South Access

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	3	5	10	5	21	9	43	15	24	48	76
Future Vol, veh/h	45	3	5	10	5	21	9	43	15	24	48	76
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	3	5	11	5	22	9	45	16	25	51	80
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	226	220	91	216	252	53	131	0	0	61	0	0
Stage 1	141	141	-	71	71	-	-	-	-	-	-	-
Stage 2	85	79	-	145	181	-	-	-	-	-	-	-
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	729	678	967	740	651	1014	1454	-	-	1542	-	-
Stage 1	862	780	-	939	836	-	-	-	-	-	-	-
Stage 2	923	829	-	858	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	695	662	967	720	635	1014	1454	-	-	1542	-	-
Mov Cap-2 Maneuver	695	662	-	720	635	-	-	-	-	-	-	-
Stage 1	857	766	-	933	831	-	-	-	-	-	-	-
Stage 2	892	824	-	835	737	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.5		9.4		1		1.2					
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1454	-	-	712	848	1542	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.078	0.045	0.016	-	-				
HCM Control Delay (s)	7.5	0	-	10.5	9.4	7.4	0	-				
HCM Lane LOS	A	A	-	B	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.1	-	-				

HCM 6th TWSC
8: Monaghan Rd & PA-12 Access/PA-13 Access

2040 Total Traffic
PM 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	33	0	6	9	0	44	6	731	16	75	1035	71
Future Vol, veh/h	33	0	6	9	0	44	6	731	16	75	1035	71
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	150	-	-	150	-	-	350	-	-	350	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	0	6	9	0	46	6	769	17	79	1089	75

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1605	2083	582	1384	2112	393	1164	0	0	786	0	0
Stage 1	1285	1285	-	790	790	-	-	-	-	-	-	-
Stage 2	320	798	-	594	1322	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	328	130	*678	*483	123	518	*853	-	-	496	-	-
Stage 1	552	569	-	*278	400	-	-	-	-	-	-	-
Stage 2	611	396	-	*696	541	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	261	109	*678	*418	103	518	*853	-	-	496	-	-
Mov Cap-2 Maneuver	261	109	-	*418	103	-	-	-	-	-	-	-
Stage 1	548	478	-	*276	397	-	-	-	-	-	-	-
Stage 2	552	393	-	*580	455	-	-	-	-	-	-	-



















Approach	EB		WB		NB		SB	
HCM Control Delay, s	19.3		12.8		0.1		0.9	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	* 853	-	-	261	678	418	518	496	-	-
HCM Lane V/C Ratio	0.007	-	-	0.133	0.009	0.023	0.089	0.159	-	-
HCM Control Delay (s)	9.3	-	-	20.9	10.4	13.8	12.6	13.6	-	-
HCM Lane LOS	A	-	-	C	B	B	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0.1	0.3	0.6	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

Timings
9: Powhaton Rd & E. Exposition Ave

2040 Total Traffic
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	35	5	173	5	10	509	268	335	767
Future Volume (vph)	35	5	173	5	10	509	268	335	767
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	7	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
Minimum Split (s)	10.0	23.0	10.0	23.0	10.0	24.0	24.0	10.0	24.0
Total Split (s)	15.0	25.0	15.0	25.0	15.0	60.0	60.0	20.0	65.0
Total Split (%)	12.5%	20.8%	12.5%	20.8%	12.5%	50.0%	50.0%	16.7%	54.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	4.0	3.0	4.0
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	6.0	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	10.1	7.3	16.6	9.9	61.3	54.6	54.6	72.5	69.6
Actuated g/C Ratio	0.10	0.07	0.17	0.10	0.61	0.55	0.55	0.72	0.70
v/c Ratio	0.21	0.08	0.67	0.65	0.03	0.19	0.28	0.53	0.24
Control Delay	42.4	35.9	50.8	15.7	6.9	13.3	2.8	8.9	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	35.9	50.8	15.7	6.9	13.3	2.8	8.9	7.2
LOS	D	D	D	B	A	B	A	A	A
Approach Delay		41.0		30.8		9.6			7.7
Approach LOS		D		C		A			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 100.1

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 12.9

Intersection LOS: B

Intersection Capacity Utilization 64.2%

ICU Level of Service C










Analysis Period (min) 15

Splits and Phases: 9: Powhaton Rd & E. Exposition Ave

			
20 s	60 s	15 s	25 s
			
15 s	65 s	15 s	25 s







Queues
9: Powhaton Rd & E. Exposition Ave

2040 Total Traffic
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	37	10	182	241	11	536	282	353	844
v/c Ratio	0.21	0.08	0.67	0.65	0.03	0.19	0.28	0.53	0.24
Control Delay	42.4	35.9	50.8	15.7	6.9	13.3	2.8	8.9	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	35.9	50.8	15.7	6.9	13.3	2.8	8.9	7.2
Queue Length 50th (ft)	23	3	108	3	2	62	0	68	59
Queue Length 95th (ft)	48	20	179	79	9	108	45	151	144
Internal Link Dist (ft)		899		736		1040			1188
Turn Bay Length (ft)	350		250		350		250	250	
Base Capacity (vph)	225	351	275	509	511	2771	991	702	3511
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	0.16	0.03	0.66	0.47	0.02	0.19	0.28	0.50	0.24
Intersection Summary									

HCM 6th TWSC
10: Future PA-8 Access/PA-5 Access & E. Exposition Ave

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	534	42	28	353	23	29	0	21	17	0	20
Future Vol, veh/h	32	534	42	28	353	23	29	0	21	17	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	562	44	29	372	24	31	0	22	18	0	21







Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	396	0	0	606	0	0	1105	1106	584	1105	1116	384
Stage 1	-	-	-	-	-	-	652	652	-	442	442	-
Stage 2	-	-	-	-	-	-	453	454	-	663	674	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1163	-	-	972	-	-	188	210	512	188	208	664
Stage 1	-	-	-	-	-	-	457	464	-	594	576	-
Stage 2	-	-	-	-	-	-	586	569	-	450	454	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1163	-	-	972	-	-	174	198	512	172	196	664
Mov Cap-2 Maneuver	-	-	-	-	-	-	174	198	-	172	196	-
Stage 1	-	-	-	-	-	-	444	451	-	577	559	-
Stage 2	-	-	-	-	-	-	550	552	-	418	441	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.6			24.1			19.5		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	241	1163	-	-	972	-	-	287
HCM Lane V/C Ratio	0.218	0.029	-	-	0.03	-	-	0.136
HCM Control Delay (s)	24.1	8.2	-	-	8.8	-	-	19.5
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0.1	-	-	0.5

HCM 6th TWSC
11: Future PA-10 Access/PA-7 Access & E. Exposition Ave

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	497	47	20	359	12	28	0	15	7	0	17
Future Vol, veh/h	29	497	47	20	359	12	28	0	15	7	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	31	523	49	21	378	13	29	0	16	7	0	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	391	0	0	572	0	0	1046	1043	548	1045	1061	385
Stage 1	-	-	-	-	-	-	610	610	-	427	427	-
Stage 2	-	-	-	-	-	-	436	433	-	618	634	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1168	-	-	1001	-	-	206	229	536	207	224	663
Stage 1	-	-	-	-	-	-	482	485	-	606	585	-
Stage 2	-	-	-	-	-	-	599	582	-	477	473	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1168	-	-	1001	-	-	193	218	536	194	213	663
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	218	-	194	213	-
Stage 1	-	-	-	-	-	-	469	472	-	590	573	-
Stage 2	-	-	-	-	-	-	571	570	-	451	460	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.4			22.7			14.9		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	248	1168	-	-	1001	-	-	389
HCM Lane V/C Ratio	0.183	0.026	-	-	0.021	-	-	0.065
HCM Control Delay (s)	22.7	8.2	-	-	8.7	-	-	14.9
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0.1	-	-	0.2







HCM 6th Roundabout
12: Trussville Rd & E. Exposition Ave

2040 Total Traffic
PM Peak Hour

Intersection				
Intersection Delay, s/veh	7.2			
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	547	460	139	66
Demand Flow Rate, veh/h	558	469	142	67
Vehicles Circulating, veh/h	144	99	518	497
Vehicles Exiting, veh/h	420	561	184	71
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.1	6.6	6.3	5.2
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	558	469	142	67
Cap Entry Lane, veh/h	1191	1247	814	831
Entry HV Adj Factor	0.981	0.980	0.980	0.985
Flow Entry, veh/h	547	460	139	66
Cap Entry, veh/h	1169	1223	797	819
V/C Ratio	0.468	0.376	0.175	0.081
Control Delay, s/veh	8.1	6.6	6.3	5.2
LOS	A	A	A	A
95th %tile Queue, veh	3	2	1	0

HCM 6th TWSC
13: Future Access/PA-12 Access & E. Exposition Ave

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	444	49	49	377	21	29	0	29	12	0	32
Future Vol, veh/h	31	444	49	49	377	21	29	0	29	12	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	467	52	52	397	22	31	0	31	13	0	34





















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	419	0	0	519	0	0	1088	1082	493	1087	1097	408
Stage 1	-	-	-	-	-	-	559	559	-	512	512	-
Stage 2	-	-	-	-	-	-	529	523	-	575	585	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1140	-	-	1047	-	-	193	217	576	194	213	643
Stage 1	-	-	-	-	-	-	513	511	-	545	536	-
Stage 2	-	-	-	-	-	-	533	530	-	503	498	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1140	-	-	1047	-	-	172	200	576	173	196	643
Mov Cap-2 Maneuver	-	-	-	-	-	-	172	200	-	173	196	-
Stage 1	-	-	-	-	-	-	498	496	-	529	509	-
Stage 2	-	-	-	-	-	-	480	504	-	463	484	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.9			22.6			16.2		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	265	1140	-	-	1047	-	-	369
HCM Lane V/C Ratio	0.23	0.029	-	-	0.049	-	-	0.126
HCM Control Delay (s)	22.6	8.3	-	-	8.6	-	-	16.2
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.2	-	-	0.4

Timings
14: Monaghan Rd & E. Exposition Ave

2040 Total Traffic
PM Peak Hour

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	95	342	47	76	254	83	53	575	137	775
Future Volume (vph)	95	342	47	76	254	83	53	575	137	775
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	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	23.0	10.0	24.0	10.0	24.0
Total Split (s)	15.0	40.0	40.0	15.0	40.0	40.0	15.0	45.0	20.0	50.0
Total Split (%)	12.5%	33.3%	33.3%	12.5%	33.3%	33.3%	12.5%	37.5%	16.7%	41.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
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	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	None	Max
Act Effect Green (s)	31.9	24.8	24.8	31.1	24.4	24.4	49.6	41.3	56.2	46.9
Actuated g/C Ratio	0.31	0.24	0.24	0.30	0.24	0.24	0.48	0.40	0.55	0.46
v/c Ratio	0.33	0.80	0.10	0.34	0.61	0.19	0.17	0.35	0.34	0.42
Control Delay	25.4	52.0	0.4	26.3	41.9	3.4	15.4	23.6	16.0	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	52.0	0.4	26.3	41.9	3.4	15.4	23.6	16.0	22.1
LOS	C	D	A	C	D	A	B	C	B	C
Approach Delay		41.8			31.3			23.0		21.3
Approach LOS		D			C			C		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 103

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 27.0









Intersection LOS: C

Intersection Capacity Utilization 61.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 14: Monaghan Rd & E. Exposition Ave

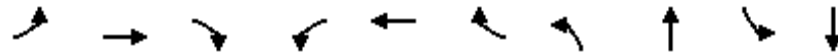
			
Ø1	Ø2	Ø3	Ø4
20 s	45 s	15 s	40 s
			
Ø5	Ø6	Ø7	Ø8
15 s	50 s	15 s	40 s

Queues

14: Monaghan Rd & E. Exposition Ave

2040 Total Traffic

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	360	49	80	267	87	56	706	144	962
v/c Ratio	0.33	0.80	0.10	0.34	0.61	0.19	0.17	0.35	0.34	0.42
Control Delay	25.4	52.0	0.4	26.3	41.9	3.4	15.4	23.6	16.0	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	52.0	0.4	26.3	41.9	3.4	15.4	23.6	16.0	22.1
Queue Length 50th (ft)	45	232	0	36	164	0	17	118	47	164
Queue Length 95th (ft)	83	350	0	70	255	20	45	187	98	246
Internal Link Dist (ft)		886			1402			1165		1345
Turn Bay Length (ft)	150		150	150		150	350		350	
Base Capacity (vph)	322	648	628	261	648	628	374	2012	494	2280
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	0.31	0.56	0.08	0.31	0.41	0.14	0.15	0.35	0.29	0.42
Intersection Summary										