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Hannah Ridge at Feathergrass
Sketch Plan Update
Traffic Impact Analysis
(LSC #174210)

March 30, 2017

Add filing
number(s)

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

Jeffrey C. Hodsdon, P.E. #31684



Date

3/30/17

Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

Date



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March 30, 2017

Feathergrass Investments, LLC
c/o David R. Gorman, P.E.
M.V.E. Inc.
1903 Lelaray Street, Suite 200
Colorado Springs, CO 80909

RE: Hannah Ridge at Feathergrass
Sketch Plan Update
El Paso County, CO
Traffic Impact Analysis
LSC #174210

Dear Mr. Gorman:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the Hannah Ridge at Feathergrass development located north and south of Constitution Avenue and west of Marksheffel Road in El Paso County, Colorado. The site location is shown in Figure 1. A previous traffic impact study for this development was completed by LSC dated October 23, 2007.

REPORT CONTENTS

This report is being prepared as part of a submittal to El Paso County. It identifies the traffic impacts of this development. The report contains the following:

- The traffic count data and street conditions.
- Projections of short-term (2020) and long-term (2040) baseline/background traffic volumes.
- The projected average weekday and peak-hour vehicle-trips to be generated by the site by phase.
- The assignment of the site's projected traffic volumes to the key area streets and intersections for the short and long term and the resulting total traffic volumes for the short and long term.
- The resulting traffic impacts including level of service analysis at key intersections and average daily traffic volumes on key street sections in the vicinity of the site.
- Recommended lane configuration for Constitution Avenue.
- Recommendations for contributions for a future traffic signal at Hannah Ridge/Constitution.

LAND USE AND ACCESS

The Hannah Ridge at Feathergrass development is planned to contain a mix of residential and commercial uses. The proposed preliminary plan is attached. The preliminary plan also shows the proposed phasing of the development.

The Hannah Ridge at Feathergrass development is planned to contain 353 lots for single-family homes. The 2007 study assumed the site would be developed with 354 lots for single-family homes. Since completion of that report 45 lots have been platted as part of Filing No. 1 and 39 lots have been platted as Filing No. 2. Homes have been constructed on about 36 of the Filing No. 1 lots. Hunter Jumper Drive and Winslow Park Drive have been constructed from Equine Court to serve Filing No. 1. Hannah Ridge Drive has not yet been extended north of Constitution Avenue. Thirty-nine lots are currently proposed to be platted as Filing No. 3. With this filing, Hunter Jumper Drive and Winslow Park Drive would be extended east to Grand Prix Court and Hannah Ridge Drive would be extended north from Constitution Avenue to Winslow Park Drive. Shawnee Drive would not be extended north of Constitution as part of this filing.

The remaining 230 lots for single-family homes are proposed for future Filings 4 through 8. Future Filing 9 is located west of Hannah Ridge Drive between Constitution Avenue and Hunter Jumper Drive. The 2007 traffic impact study assumed this area would be developed with about 205 multi-family dwelling units. Future Filing 10 is located in three tracts on the northwest, northeast, and southeast corners of the intersection of Akers/Constitution. The 2007 traffic impact study assumed these parcels would be developed with about 400,000 square feet of retail floor space including a 70,000 supermarket. Access to Filing 10 is proposed via Akers Drive. An additional right-in/right-out-only access is proposed on the north side of Constitution east of Akers Drive and a right-in-only access on the south side on Constitution. No changes are currently planned for Filings 9 and 10.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

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

- **Constitution Avenue** is a Principal Arterial adjacent to the site extending from Paseo Road east to US Highway (US) 24. In the vicinity of the site, Constitution Avenue has two through lanes in each direction plus continuous right-turn lanes and left-turn lanes. The posted speed limit on Constitution Avenue adjacent to the site is 50 miles per hour (mph). Constitution Avenue is shown as a future six-lane street on the County *Major Transportation Corridor Plan* (MTCP).
- **Hannah Ridge Drive** is a Collector that extends north from just south of Palmer Park Boulevard to Constitution Avenue. Hannah Ridge Drive is planned to be extended north as part of Hannah Ridge at Feathergrass Filing 3. The Constitution Avenue/Hannah Ridge Drive intersection is planned to be signalized in the future.
- **Akers Drive** is a Non-Residential Collector extending between Constitution Avenue and North Carefree Circle west of Marksheffel Road. The posted speed limit on Akers Drive is 35 mph. The Constitution Avenue/Akers Drive intersection is planned to be signalized in the future.

Existing Traffic Volumes

Figure 2 shows the existing peak-hour traffic volumes and existing lane geometries and traffic controls at the intersections of Constitution Avenue/Hannah Ridge Drive and Constitution Avenue/Akers Drive. The traffic volumes are based on counts by LSC in March 2017. Figure 2 also shows estimates of the daily traffic volumes based on the peak-hour counts on key street segments in the vicinity of the site. The traffic count reports are attached.

Existing Level of Service

Level of service (LOS) is a quantitative measure of the level of delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 1 shows the level of service delay ranges.

Table 1 Intersection Levels of Service Delay Ranges		
Level of Service	Signalized Intersections	Unsignalized Intersections
	Control Delay (seconds per vehicle)	
A	10 sec or less	10 sec or less
B	10-20 sec	10-15 sec
C	20-35 sec	15-25 sec
D	35-55 sec	25-35 sec
E	55-80 sec	35-50 sec
F	80 sec or more	50 sec or more

The intersections of Constitution Avenue/Hannah Ridge Drive and Constitution Avenue/Akers Drive have been analyzed to determine the existing levels of service based on the unsignalized method of analysis procedures found in the *Highway Capacity Manual, 2010 Edition* by the Transportation Research Board. The results of the analysis are shown in Figure 2. The level of service reports are attached.

All movements at the intersections of Constitution Avenue/Hannah Ridge Drive and Constitution Avenue/Akers Drive are currently operating at a satisfactory level of service (LOS D or better) during the peak hours as stop-sign-controlled intersections.

TRIP GENERATION

Estimates of the traffic volumes expected to be generated by the proposed land were made using the nationally published trip generation rates found in *Trip Generation, 9th Edition, 2012* by the Institute of Transportation Engineers (ITE). Table 2 shows the trip generation estimates for the

Hannah Ridge at Feathergrass development by phase. The trip generation estimate includes vehicle-trips estimated to be generated by homes that have already been constructed in Filing 1.

Table 2 also shows the trip generation estimate from the 2007 traffic impact study. Although the anticipated land uses for Phases 9 and 10 have not changed the ITE trip generation rates for "Shopping Center" and "Supermarket" have changed between the 7th edition published in 2003 and the current 9th edition resulting in a slightly lower trip generation estimate for these parcels.

The total number of external new impact vehicle-trips generated by the retail land uses has been reduced to take into account the "pass-by" phenomena. A pass-by trip is made by a motorist who would already be on the adjacent roadways regardless of the proposed development, but who stops in at the site while passing by. The motorist would then continue on his or her way to a final destination in the original direction. The pass-by percentages shown on Table 2 are from the *Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition, 2014* by ITE.

At buildout the site is expected to generate about 17,547 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 415 vehicles would enter and 478 vehicles would exit the site. During the afternoon peak hour of the adjacent street traffic, which generally occurs for one hour between 4:15 and 6:15 p.m., about 1,199 vehicles would enter and 1,097 vehicles would exit the site.

SHORT-TERM BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the adjacent roadways and at adjacent intersections without the proposed development's trip generation of site-generated traffic volumes. Background traffic includes increases in the through traffic and the traffic generated by nearby developments, but assumes zero traffic generated by the site including the existing homes within Hannah Ridge at Feathergrass Filing 1. Figure 3 shows the background traffic for the short term (year 2020). The short-term background traffic volumes were based on the existing volumes shown in Figure 2 with some growth in existing through volumes on Constitution Avenue minus the portion of the traffic volumes estimates to be generated by the existing homes within Hannah Ridge at Feathergrass Filing 1.

2040 BACKGROUND TRAFFIC

Figure 4 shows the projected background traffic volumes for the year 2040. These volumes are estimates by LSC based on previous work completed in the area including The Sands located east of Marksheffel and north of Constitution Avenue and The Wilshire Subdivision located south and west of the site.

DIRECTIONAL DISTRIBUTION

The directional distribution of the site-generated traffic volumes on the area roadways is an important factor in determining the site's traffic impacts. Figure 5 shows the directional distribution estimates for the site-generated traffic volumes. The estimates have been based on the following factors: the site's location with respect to the City of Colorado Springs, Peterson Air Force Base to the south,

and the developing area to the east; the roadway system serving the site; the site's proposed land uses; and the existing traffic counts. The pass-by trips were assigned based, in large part, on the magnitude and direction of the existing traffic volumes on the adjacent roadways.

SITE-GENERATED TRAFFIC

The site-generated traffic volumes were calculated by applying the directional distribution percentages (from Figure 5) to the trip generation estimates from Table 2. Figures 6 through 11 show the projected site-generated traffic volumes by filing.

Figure 6 shows site-generated traffic volumes for the 39 lots for single-family homes currently proposed for Filing 3. The figure shows the projected traffic volumes based on the short-term condition with Hannah Ridge Drive extended north to Hunter Jumper Drive and Hunter Jumper Drive and Winslow Park Drive extended east adjacent to Filing 3. The short-term volumes assume Shawnee Drive has not been extended north of Constitution Avenue and Under Saddle Street has not been constructed. The long-term estimates assume buildout of the Hannah Ridge at Feathergrass street system.

Figure 7 shows the site-generated traffic volumes for Filings 1 through 3. These volumes include estimates of traffic projected to be generated by existing homes within Filing 1. These volumes also assume Hannah Ridge Drive extended north to Hunter Jumper Drive and Hunter Jumper Drive and Winslow Park Drive extended east adjacent to Filing 3. The short-term volumes assume Shawnee Drive has not been extended north of Constitution Avenue and Under Saddle Street has not been constructed.

Figure 8 shows the site-generated traffic volumes at buildout of the single-family lots (Filings 1 through 8). These volumes assume buildout of the Hannah Ridge at Feathergrass street system north of Constitution Avenue and west of Akers Drive. These volumes also assume the intersection of Constitution/Shawnee has been restricted to three-quarter movement (left-in/right-in/right-out only).

Figures 9 and 10 show the site-generated traffic volumes for the future multi-family development assumed for Filing 9 and the future commercial development assumed for Filing 10. Figure 11 shows site-generated traffic at buildout of the Hannah Ridge at Feathergrass development. These volumes are the sum of the volumes shown in Figures 8, 9, and 10.

2020 (FILINGS 1 THROUGH 3 ONLY) TOTAL TRAFFIC

Figure 12 shows the projected short-term (Filings 1 through 3 only) total traffic volumes. The 2020 total traffic volumes are the sum of the short-term background traffic volumes (from Figure 4) plus the short-term phase one site-generated traffic volumes from Figure 7. These volumes represent the short-term impacts of the development.

2040 TOTAL TRAFFIC

Figure 13 shows the projected 2040 total traffic volumes. The 2040 total traffic volumes are the sum of the 2040 background traffic volumes (from Figure 3) plus the buildout site-generated traffic volumes from Figure 11.

PROJECTED LEVELS OF SERVICE

All of the intersections along Constitution Avenue adjacent to the site were analyzed to determine the projected levels of service for the 2020 and 2040 background and total traffic volumes based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 2010 Edition* by the Transportation Research Board and the Synchro signalized intersection procedures. Figures 12 and 13 show the level of service analysis results. The laneage and traffic control assumed in the analysis are depicted on the figures. The level of service reports are attached.

Constitution/Akers

All movements at the intersection of Constitution/Akers are projected to continue to operate at a satisfactory level of service (LOS D or better) during the peak hours based on the 2020 total traffic volumes assuming this intersection remains stop-sign controlled. By 2040, this intersection was assumed to be signalized. All movements are projected to operate at a satisfactory level of service based on the projected 2040 total traffic volumes.

Constitution/Hannah Ridge

The northbound left-turn movement and the southbound left-turn and through movements at the intersection of Constitution/Hannah Ridge are projected to operate at LOS E during the peak hours based on the projected 2020 total traffic volumes assuming this intersection remains stop-sign controlled. This intersection is planned to be signalized in the future. It is common for the minor/side-street intersection approaches to operate at LOS E or F as the intersection volumes approach the volumes needed to satisfy a traffic signal warrant. As a signalized intersection, all movements are projected to operate at a satisfactory level of service during the peak hours based on the projected 2040 total traffic volumes.

Constitution/Shawnee

It was assumed that the intersection of Constitution/Shawnee would be restricted to three-quarter movement (left-in/right-in/right-out only) once Shawnee is extended north of Constitution. This is not planned to occur until development of Hannah Ridge at Feathergrass Filing 4. Based on the projected 2040 total traffic volumes all movements at this intersection are projected to operate at LOS C or better during the peak hours.

Constitution Site Access

All movements at the proposed right-in/right-out-only access to Constitution Avenue (right-in only on the south side) are projected to operate at LOS C or better during the peak hours based on the projected 2040 total traffic volumes.

VEHICLE QUEUING ANALYSIS

A queuing analysis was performed using Synchro/SimTraffic to determine if the proposed 300-foot eastbound left-turn lane on Constitution Avenue approaching Hannah Ridge Drive Road will be sufficient to accommodate the projected total traffic volumes. The 2040 total afternoon peak-

hour traffic volumes were entered into the Synchro model. The simulation was run five times. The projected eastbound left-turn queue on Constitution Avenue approaching Hannah Ridge Drive is about 77 feet long. The queuing reports are attached.

TRAFFIC SIGNAL WARRANT ANALYSIS

The intersection of Constitution Avenue and Hannah Ridge Drive was analyzed to determine if a Four-Hour Vehicular Volume Traffic Signal Warrant threshold would be reached or exceeded based on the projected 2020 total traffic volumes. The results of the analysis are shown in Figure 14. The traffic volumes shown are based on the 2020 total traffic volumes shown in Figure 12. As shown in Figure 14, the thresholds for a Four-Hour Vehicular Volume Traffic Signal Warrant are projected to be exceeded based on the morning peak hour but not the afternoon peak hour. This analysis using the peak hours is intended to provide an indication that a warrant may be met or is close to being met. In order for a Four-Hour Traffic Signal Warrant to be satisfied, the volume threshold would need to be met for two additional hours of the day. For example, the four-hour warrant would be satisfied with the volume thresholds met for one hour in the morning, two hours (instead of the one-hour peak) during the afternoon peak period, and an hour during the mid-afternoon. Based on this analysis and our experience, it is likely that the volume thresholds would **not** be met or exceeded until additional development occurs south of Constitution Avenue. Therefore, it is expected that a traffic signal would **not** be warranted in the short term.

ESCROW FOR FUTURE TRAFFIC SIGNAL

An estimate of the fair contribution to the cost of a future traffic signal at the intersection of Constitution Avenue and Hannah Ridge Drive of the currently planned development has been calculated for the currently proposed Hannah Ridge at Feathergrass Filing 3 as this signal is not covered in the MTCP, so transportation impact fees will not contribute to its construction.

The cost of this signal is approximately \$250,000. A projection of the key site-generated peak-hour intersection turning movement traffic volumes at the intersection of Hannah Ridge/Constitution due to the Hannah Ridge at Feathergrass Filing No. 3 (shown in Figure 6) was compared to the 2040 total traffic volumes shown in Figure 11 to determine a fair share contribution to this signal by this development. As traffic signal percentages have been based on the minor street approach volumes, only the northbound and southbound left-turn and through movements were included in determining the fair share contribution. The site-generated traffic for Filing 3 only would be 1.39 percent of the total (southbound site traffic divided by this sum of the morning and afternoon left-turn/through volumes from both sides). The site contribution toward the signal would be \$3,467 (1.39 percent of a \$250,000 signal cost). Table 3 presents the above signal escrow calculations.

ROADWAY IMPROVEMENT FEE PROGRAM

This development is subject to fees established by the El Paso County Road Impact Fee Program per El Paso County Resolution Number 12-382. The owner is petitioning for inclusion of the new residential lots into the Public Improvements District No. 2 (the 10 mil PID). The fee per single-family detached dwelling in the 10-mil PID is \$609.00. (Note: The proposed updated fee rate with the current MTCP update is \$923 per single-family dwelling unit). This fee will be paid at the time of building permit issuance. The Hannah Ridge at Feathergrass property is also contained within

the Constitution Heights Metropolitan District and lots are subject to traffic impact-related building permit fees pursuant to a 2009 IGA. The fee in Hannah Ridge at Feathergrass is \$637.15 per single-family residential lot to be paid at the time of building permit issuance. However, the lots in Hannah Ridge at Feathergrass are also eligible for credit in the El Paso County Road Impact Fee Program as established by El Paso County Resolution Number 12-389. The credit is designed to offset the contribution mandated by the IGA as well as amounts already contributed to the County's transportation system in the form of road construction and dedication of right-of-way for portions of Constitution Avenue and Akers Drive by the developer.

A summary of the fees for each single-family lot in the subdivision is provided below.

The development enters Public Improvements District No. 2 (the 10 mil PID) and is subject to the requirements thereof:

- Developer pays the \$637.15 fee to El Paso County pursuant to the 2009 IGA and Resolution 12-389.
- The \$609.00 Traffic Impact Fee pursuant to Resolution 12-382 is satisfied by this payment and the County reimburses the Pikes Peak Rural Transportation Authority from the payment. **(Note: The proposed updated fee rate with the current MTCP update is \$923 per single-family dwelling unit).**

Developer accrues a credit of \$28.50 in the El Paso County Road Impact Fee Program and is entitled to use it to offset future Impact Fees pursuant to Resolution 12-389.

CONCLUSIONS AND RECOMMENDATIONS

The developer has to pay \$923.

Trip Generation

- At buildout the site is expected to generate about 17,547 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour about 415 vehicles would enter and 478 vehicles would exit the site. During the afternoon peak hour of the adjacent street traffic about 1,199 vehicles would enter and 1,097 vehicles would exit the site.

Level of Service

- All movements at the intersection of Constitution/Akers are projected to continue to operate at a satisfactory level of service (LOS D or better) during the peak hours based on the 2020 total traffic volumes assuming this intersection remains stop-sign controlled. By 2040, this intersection was assumed to be signalized. All movements are projected to operate at a satisfactory level of service based on the projected 2040 total traffic volumes.
- The northbound and southbound left-turn and through movements at the intersection of Constitution/Hannah Ridge are projected to operate at LOS E during the peak hours based on the projected 2020 total traffic volumes assuming this intersection remains stop-sign controlled. This intersection is planned to be signalized in the future. It is common for the

minor/side-street intersection approaches to operate at LOS E or F as the intersection volumes approach the volumes needed to satisfy a traffic signal warrant. As a signalized intersection, all movements are projected to operate at a satisfactory level of service during the peak hours based on the projected 2040 total traffic volumes.

- It was assumed that the intersection of Constitution/Shawnee would be restricted to three-quarter movement (left-in/right-in/right-out only) once Shawnee is extended north of Constitution. This is not planned to occur until development of Hannah Ridge at Feathergrass Filing 9. Based on the projected 2040 total traffic volumes, all movements at this intersection are projected to operate at LOS C or better during the peak hours.
- All movements at the proposed right-in/right-out-only access to Constitution Avenue (right-in only on the south side) are projected to operate at LOS C or better during the peak hours based on the projected 2040 total traffic volumes.

Filing 4?

Recommended Improvements

- Hannah Ridge Drive is proposed to be extended north of Constitution Avenue with the platting of Hannah Ridge at Feather Grass Filing 3. With this filing the eastbound left-turn lane on Constitution Avenue approaching Hannah Ridge Drive should be extended to provide a 300-foot left-turn lane. The outside westbound through lane on Constitution Avenue should be restriped for acceleration/deceleration lanes at the Hannah Ridge Drive intersection.
- Table 4 shows the recommended roadway improvements recommended for the overall Hannah Ridge at Feathergrass sketch plan.

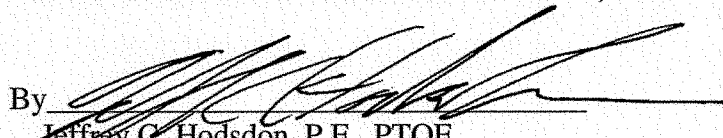
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Hasn't this been completed?

Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By 
Jeffrey C. Hodsdon, P.E., PTOE
Principal

JCH:KDF:bjwb

Enclosures: Table 2-4
Figures 1-14
Hannah Ridge at Feathergrass Preliminary Plan
Traffic Count Reports
Level of Service Reports

**Table 2
Trip Generation Estimate
Hannah Ridge Sketch Plan Update**

Phase	Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total Trips Generated						New External Trips Generated	
				Average Weekday Traffic		Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic		Morning Peak Hour		Afternoon Peak Hour		Pass-By Trips ⁽²⁾	New Weekday Traffic
				In	Out	In	Out	In	Out	In	Out	In	Out				
Trip Generation Estimate Based on the Currently Proposed Sketch Plan																	
1	210	Single-Family Detached Housing	48 DU ⁽³⁾	9.52	0.19	0.56	0.63	0.37	428	8	25	28	17	0%	428		
2	210	Single-Family Detached Housing	39 DU	9.52	0.19	0.56	0.63	0.37	371	7	22	25	14	0%	371		
3	210	Single-Family Detached Housing	39 DU	9.52	0.19	0.56	0.63	0.37	371	7	22	25	14	0%	371		
		Total Phases 1-3	123 DU						1,171	23	69	77	46		1,171		
4	210	Single-Family Detached Housing	52 DU	9.52	0.19	0.56	0.63	0.37	495	10	29	33	19	0%	495		
5	210	Single-Family Detached Housing	39 DU	9.52	0.19	0.56	0.63	0.37	371	7	22	25	14	0%	371		
6	210	Single-Family Detached Housing	16 DU	9.52	0.19	0.56	0.63	0.37	152	3	9	10	6	0%	152		
7	210	Single-Family Detached Housing	82 DU	9.52	0.19	0.56	0.63	0.37	781	15	46	52	30	0%	781		
8	210	Single-Family Detached Housing	41 DU	9.52	0.19	0.56	0.63	0.37	390	8	23	26	15	0%	390		
		Total Phases 4-8	230 DU						2,190	43	129	145	85		2,190		
		Total Phases 1-8	353 DU						3,361	66	199	222	131		3,361		
9	230	Residential Condominium/Townhouse	205 DU	5.81	0.07	0.37	0.35	0.17	1,191	15	75	71	35	0%	1,191		
		Total Phases 1-9							4,552	82	273	294	166		4,552		
10	820	Shopping Center ⁽⁴⁾	330 KSF ⁽⁵⁾	41.80	0.56	0.34	1.82	1.93	13,795	186	114	601	638	34%	9,105		
	850	Supermarket	70 KSF	86.83	2.11	1.29	4.36	4.19	6,078	148	90	305	293	36%	3,890		
		Total Phases 10							19,873	333	204	906	931		12,995		
		Total Phases 1-10							24,425	415	478	1,199	1,097		17,547		
Trip Generation Estimate From Hannah Ridge Sketch Plan Amendment/Preliminary Plan Updated Traffic Impact Analysis by LSC dated October 23, 2007																	
---	210	Single-Family Detached Housing	354 DU	9.57	0.19	0.56	0.64	0.37	3,388	66	199	225	132	0%	3,388		
---	230	Residential Condominium/Townhouse	205 DU	5.86	0.07	0.37	0.35	0.17	1,201	15	75	71	35	0%	1,201		
---	820	Shopping Center ⁽⁴⁾	330 KSF	41.80	0.55	0.35	1.88	2.03	13,795	181	116	619	671	28%	9,933		
	850	Supermarket	70 KSF	86.83	2.89	1.84	5.13	4.93	6,078	202	129	359	345	36%	3,890		
		Change in Trip Generation Estimate							24,462	465	519	1,274	1,163		18,412		
									-37	-50	-42	-74	-66		-865		

Notes:
 (1) Source: "Trip Generation, 9th Edition, 2012" by the Institute of Transportation Engineers (ITE)
 (2) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice" 3rd Edition, 2014
 (3) DU = dwelling unit
 (4) Shopping center rates were based on the ITE best-fit curve formula using the square footage of the entire commercial area (400 KSF)
 (5) KSF = 1,000 square feet of floor space
 Source: LSC Transportation Consultants, Inc.

**Table 4
Hannah Ridge at Feathergrass Sketch Plan Amendment/Preliminary Plan
Roadway Improvements**

Improvement	Type	Timing	Phase	Responsibility
Re-stripe outside westbound through lane on Constitution Avenue for acceleration/deceleration lanes approaching Hannah Ridge Drive and Shawnee Drive	Re-stripping	When Hannah Ridge Drive and Shawnee Drive are extended north of Constitution Avenue	Phase 3	Applicant and/or Metro District
Lengthen eastbound left-turn lane on Constitution Avenue approaching Shawnee Drive	Auxiliary lane	When Shawnee Drive is extended north of Constitution Avenue	Phase 4	Applicant and/or Metro District
Lengthen westbound right-turn acceleration lane on Constitution Avenue from Shawnee Drive	Auxiliary lane	When Shawnee Drive is extended north of Constitution Avenue	Phase 4	Applicant and/or Metro District
Lengthen eastbound left-turn lane on Constitution Avenue approaching Hannah Ridge Drive	Auxiliary lane	When Hannah Ridge Drive is extended north of Constitution Avenue	Phase 3	Applicant and/or Metro District
Signalization of Constitution Avenue/Akers Drive intersection	Traffic signal	When warranted	—	El Paso County
Signalization of Constitution Avenue/Hannah Ridge Drive intersection	Traffic signal	When warranted	—	Developments north and south of Constitution Avenue
Signalization of Akers Drive/Hunter Jumper Drive intersection	Traffic signal	When warranted	Phase 10	Applicant and/or Metro District
Construct dual eastbound left-turn lanes on Constitution Avenue approaching Akers Drive	Auxiliary lane	When needed	Phase 10	Developments and other trip generators along Akers Drive north of Constitution Avenue
Widen Constitution Avenue to six-lane cross section	Roadway segment	Shown on MTCP by 2040	—	Master planned

Source: LSC Transportation Consultants, Inc.

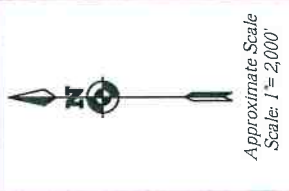


Figure 1

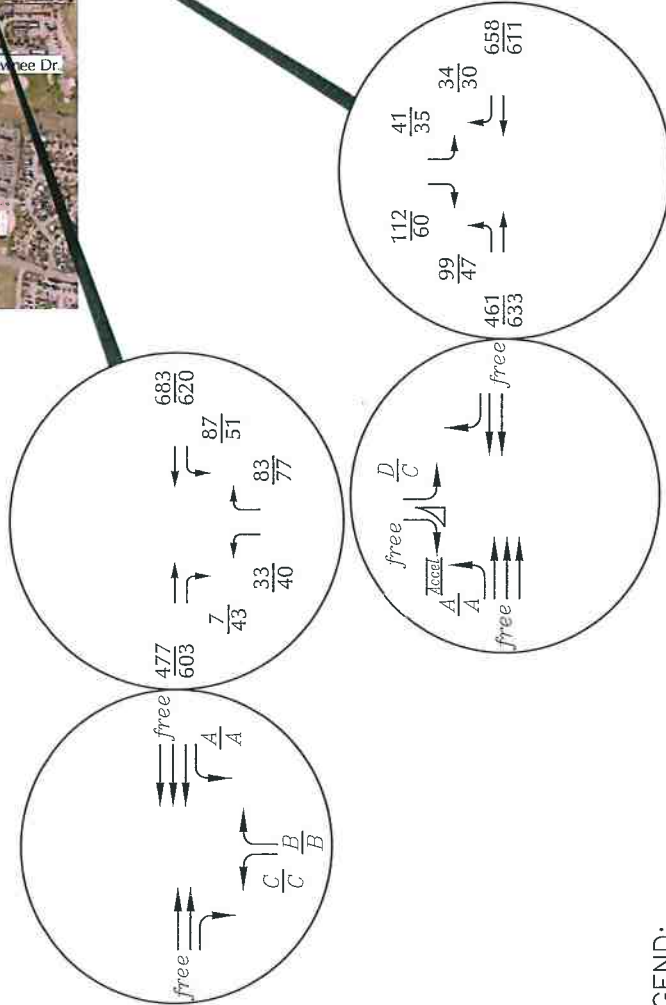
Vicinity Map

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)





Approximate Scale
Scale: 1" = 2,000'



LEGEND:

= Stop Sign

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service

$\frac{A}{B}$ = PM Individual Movement Peak-Hour Level of Service

XXX = Average Weekday Traffic (vehicles per day)



Figure 2

Existing Traffic, Lane Geometry, Traffic Control and Level of Service

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Approximate Scale
Scale: 1" = 2,000'



* Traffic estimated to be generated by existing homes within Hannah Ridge at Feathergrass Filing No. 1 are not included in the background volumes.

LEGEND:

↑ = Stop Sign

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service

$\frac{A}{B}$ = PM Individual Movement Peak-Hour Level of Service

XXX = Average Weekday Traffic (vehicles per day)



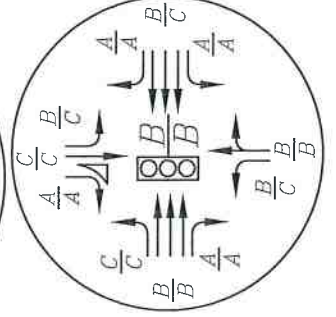
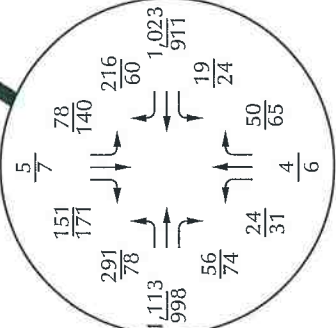
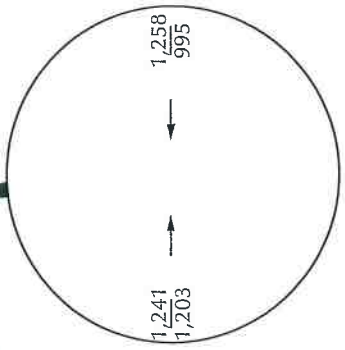
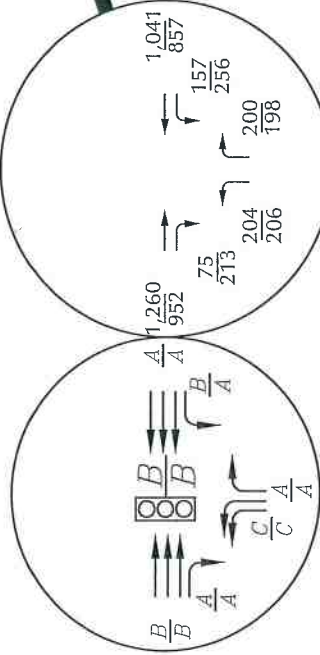
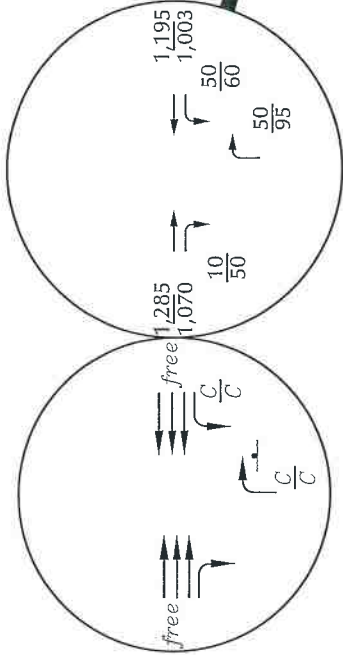
Figure 3

Year 2020 Background Traffic, Lane Geometry, Traffic Control and Level of Service

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Approximate Scale
Scale: 1" = 2,000'



LEGEND:

- ⊥ = Stop Sign
- ⊞ = Traffic Signal
- XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour)
- PM/PM = PM Weekday Peak-Hour Traffic (vehicles per hour)
- A/A = AM Individual Movement Peak-Hour Level of Service
- B/B = PM Individual Movement Peak-Hour Level of Service
- C/C = AM Entire Intersection Peak-Hour Level of Service
- D/D = PM Entire Intersection Peak-Hour Level of Service

XXX = Average Weekday Traffic (vehicles per day)



Figure 4

Year 2040 Background Traffic, Lane Geometry, Traffic Control and Level of Service

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Approximate Scale
Scale: 1" = 2,000'



LEGEND:



Commercial Percent Directional Distribution
 Residential Percent Directional Distribution

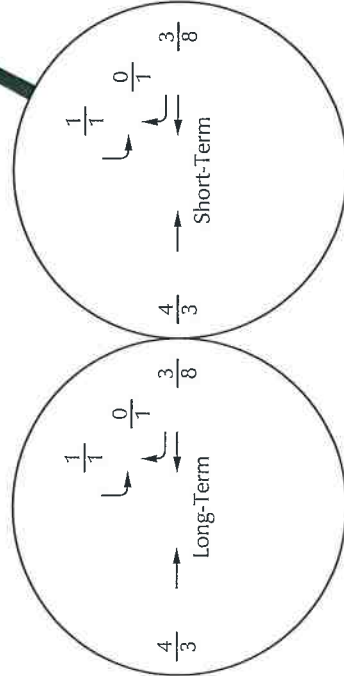
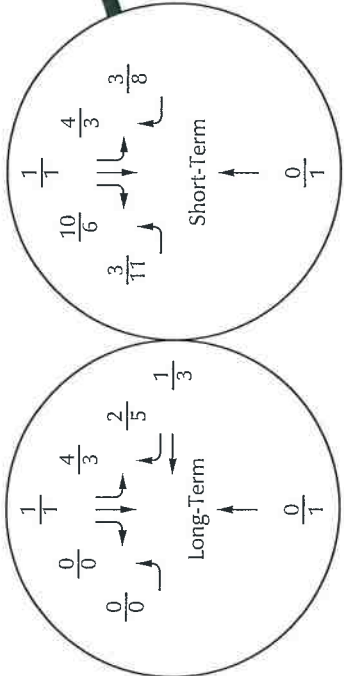
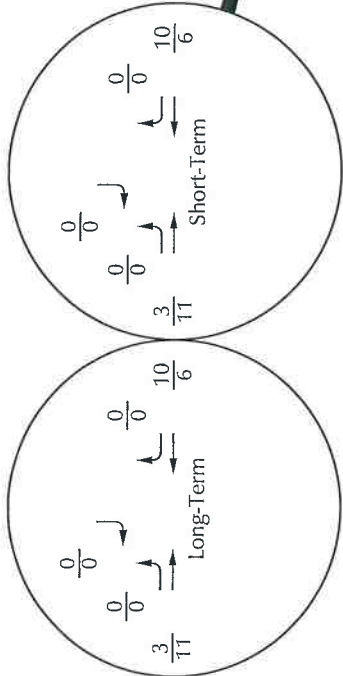


Figure 5
**Directional Distribution
 of Site-Generated Traffic**

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Approximate Scale
Scale: 1" = 2,000'



LEGEND:
 XX AM Weekday Peak-Hour Traffic (vehicles per hour)
 XX PM Weekday Peak-Hour Traffic (vehicles per hour)
 XXX = Average Weekday Traffic (vehicles per day)

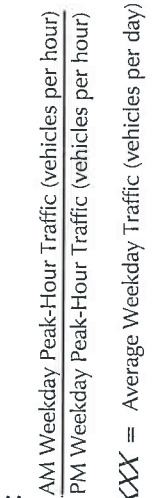


Figure 6
Assignment of
Filing 3 Only Site-Generated Traffic
 Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)

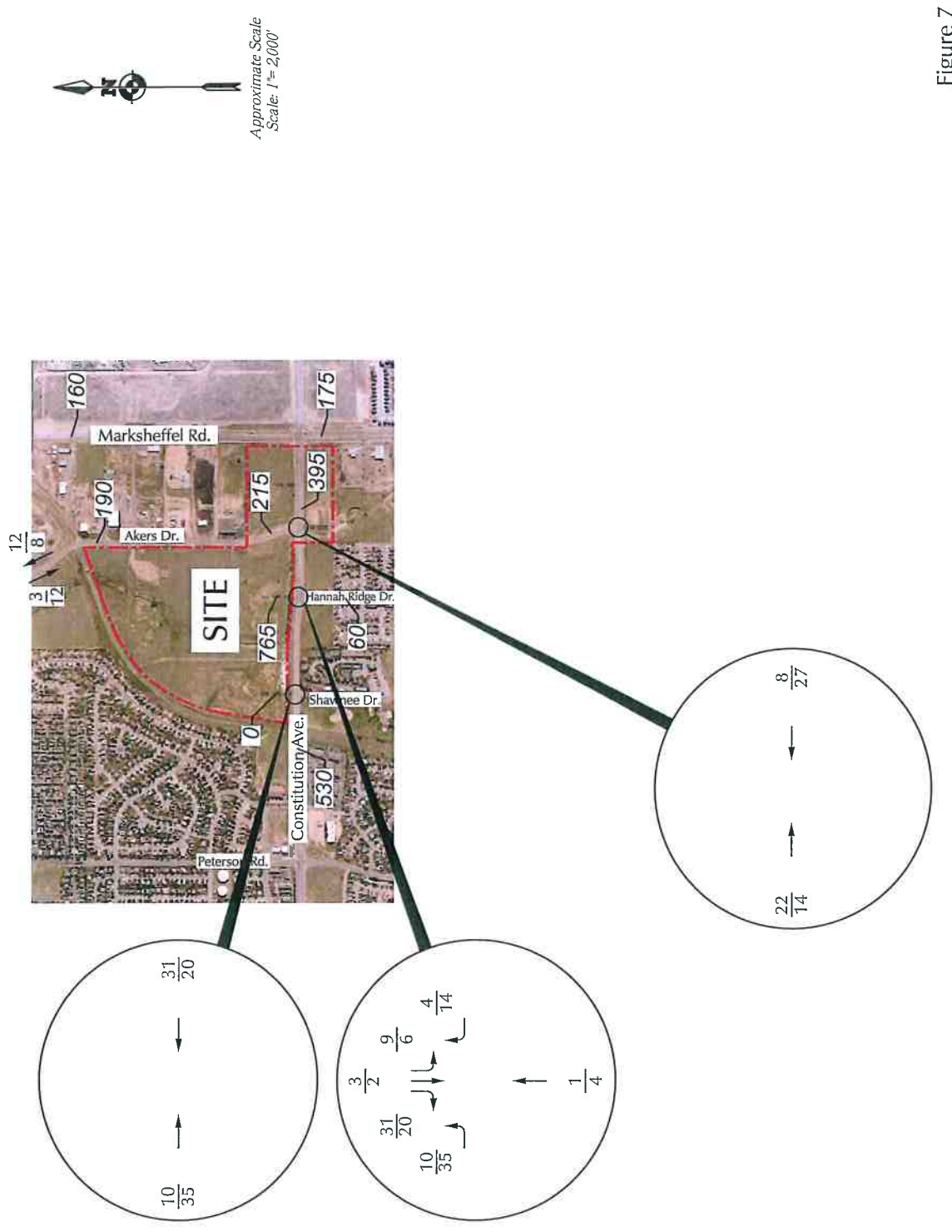


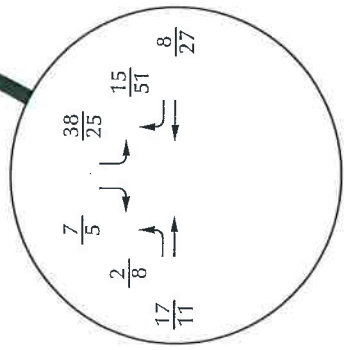
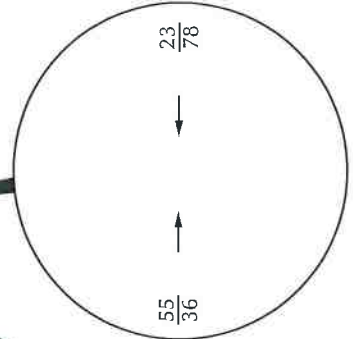
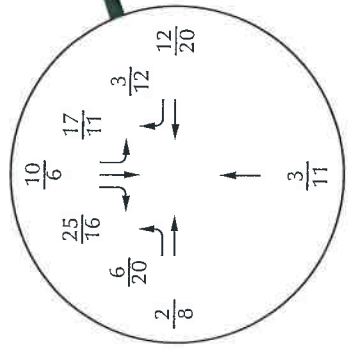
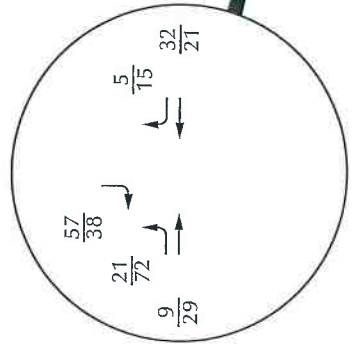
Figure 7
**Assignment of
Phase 1-3 Only Site-Generated Traffic**
Hannah Ridge at Feathergrass Sketch Plan Update (LSC #1742.10)

LEGEND:
 $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
XXX = Average Weekday Traffic (vehicles per day)





Approximate Scale
Scale: 1" = 2,000'



* Includes vehicle trips generated by existing homes in Phase 1.

LEGEND:

XX = AM Weekday Peak-Hour Traffic (vehicles per hour)

XX = PM Weekday Peak-Hour Traffic (vehicles per hour)

XXX = Average Weekday Traffic (vehicles per day)



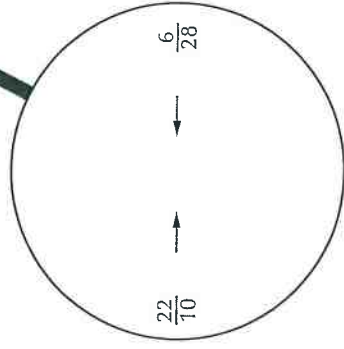
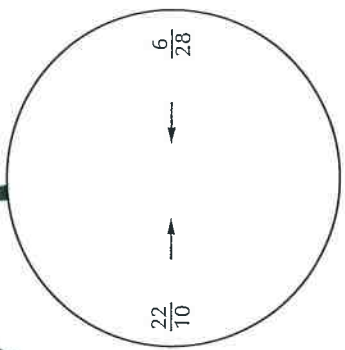
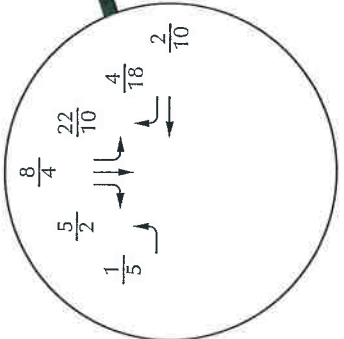
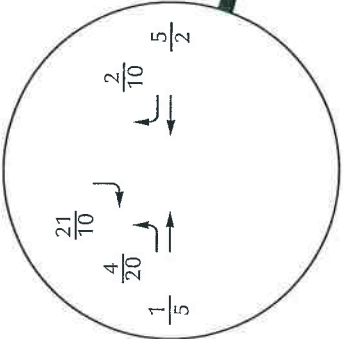
Figure 8

Assignment of Phase 1-8 Only Site-Generated Traffic*

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Approximate Scale
Scale: 1" = 2,000'



LEGEND:

XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour)

XX/XX = PM Weekday Peak-Hour Traffic (vehicles per hour)

XXX = Average Weekday Traffic (vehicles per day)



Figure 9

Assignment of Phase 9 Only Site-Generated Traffic

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Figure 10
Assignment of
Phase 10 Only Site-Generated Traffic
Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)

LEGEND:
 XX = AM Weekday Peak-Hour Traffic (vehicles per hour)
 XX = PM Weekday Peak-Hour Traffic (vehicles per hour)
 XXX = Average Weekday Traffic (vehicles per day)



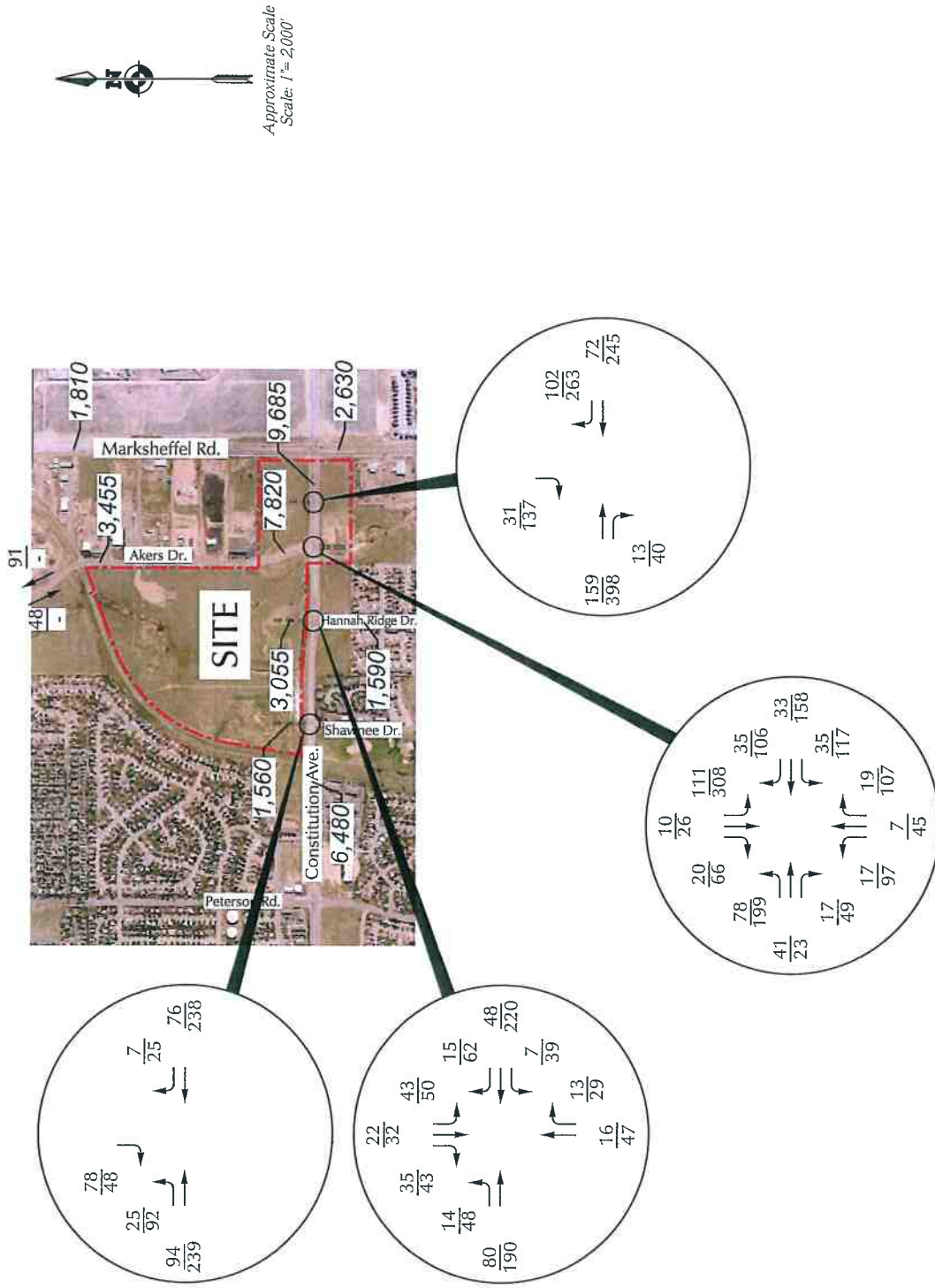
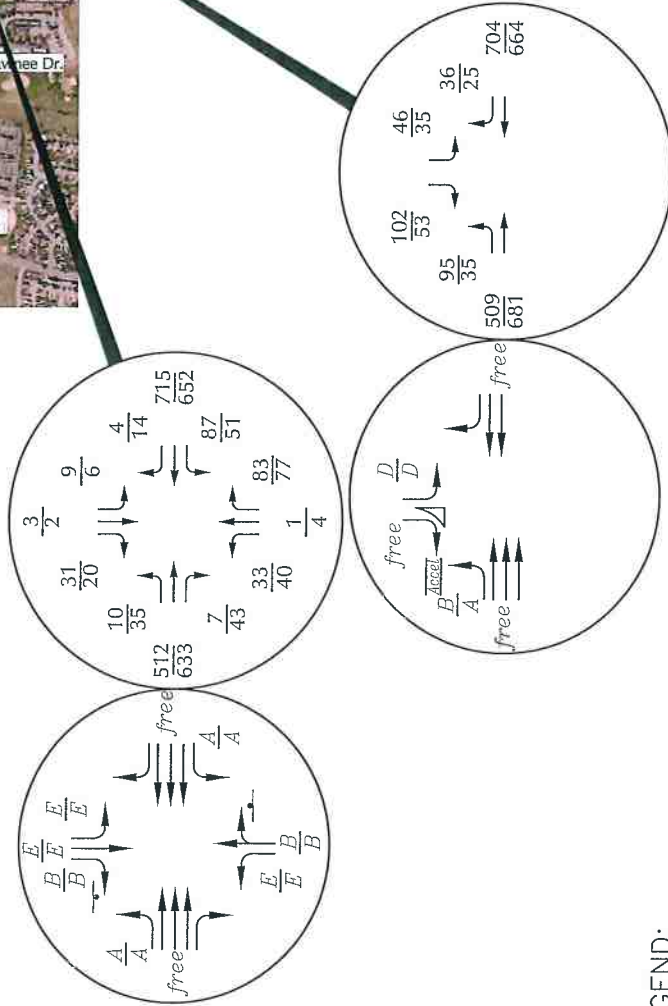


Figure 11
**Assignment of
 Buildout Site-Generated Traffic**
 Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Approximate Scale
Scale: 1" = 2,000'



LEGEND:

↑ = Stop Sign

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service

$\frac{B}{B}$ = PM Individual Movement Peak-Hour Level of Service

XXX = Average Weekday Traffic (vehicles per day)



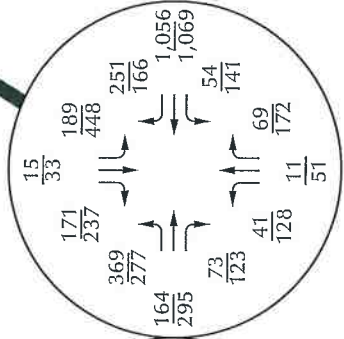
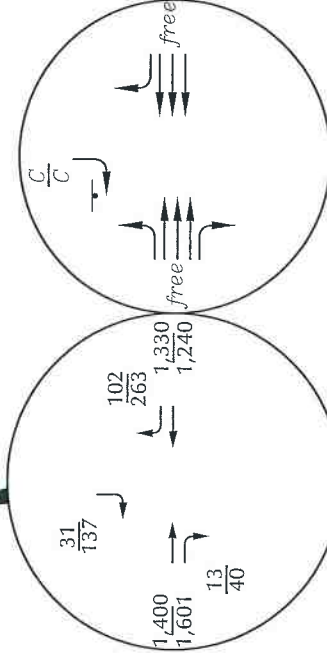
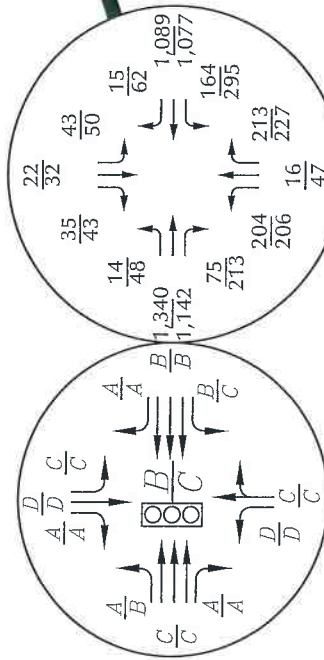
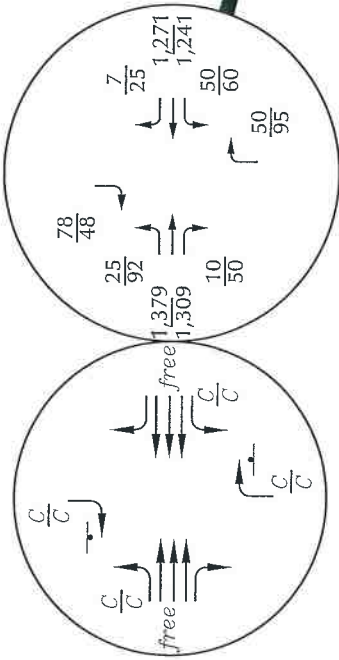
Figure 12

Year 2020 Total Traffic, Lane Geometry, Traffic Control and Level of Service

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Approximate Scale
Scale: 1" = 2,000'



LEGEND:

⊥ = Stop Sign

⊞ = Traffic Signal

XX = AM Weekday Peak-Hour Traffic (vehicles per hour)

XX = PM Weekday Peak-Hour Traffic (vehicles per hour)

A/B = AM Individual Movement Peak-Hour Level of Service

C/D = PM Individual Movement Peak-Hour Level of Service

C/D = AM Entire Intersection Peak-Hour Level of Service

D/D = PM Entire Intersection Peak-Hour Level of Service

XXX = Average Weekday Traffic (vehicles per day)

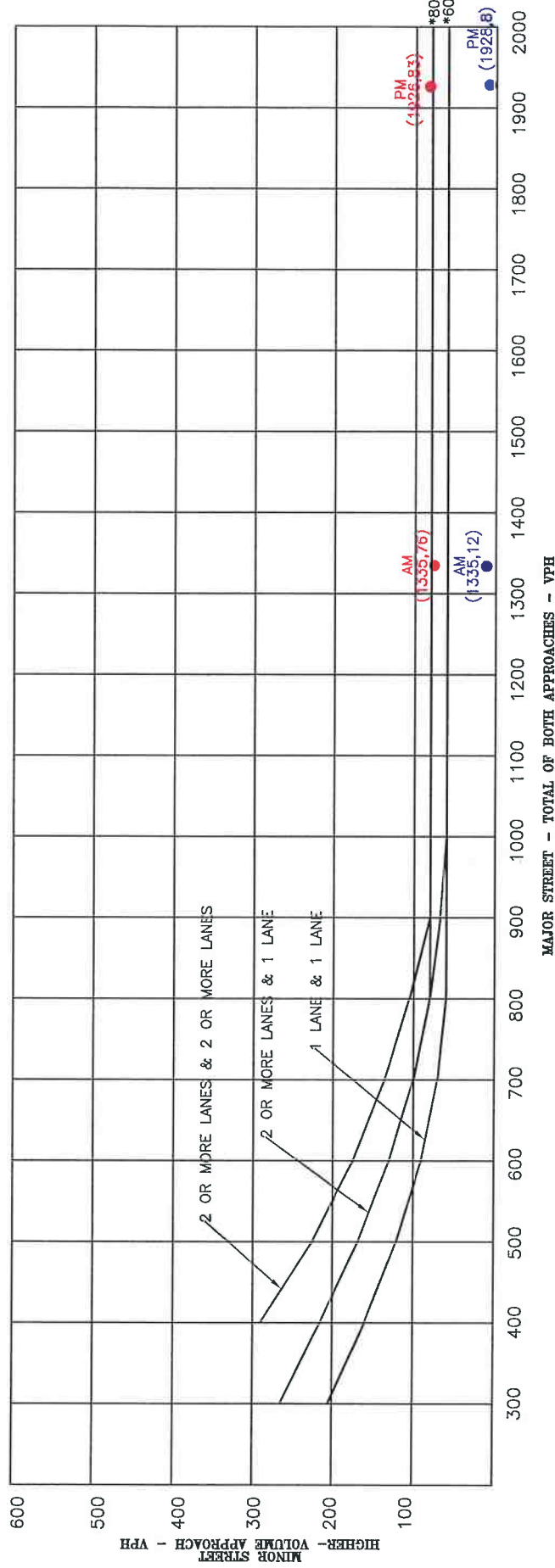
Year 2040 Total Traffic, Lane Geometry, Traffic Control and Level of Service

Figure 13

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #174210)



Figure 4C-2. Warrant 2 Four-Hour Vehicular Volume (70% Factor)
 (Community Less than 10,000 population or above 40 mph on Major Street)



* Note: 80 vph applies as the lower threshold volumes for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

- Northbound Minor Approach: (northbound left-turn and through volume plus 50% of right-turn volume).
- Southbound Minor Approach: (southbound left-turn and through volume).

Figure 14

Short-Term Traffic Signal Warrant Constitution/Hannah Ridge

Hannah Ridge at Feathergrass Sketch Plan Update (LSC #1742.10)



Hannah Ridge at Feathergrass

AMENDMENT TO THE SAND CREEK COMMUNITIES PRELIMINARY PLAN / EL PASO COUNTY, COLORADO
 THAT PORTION OF THE SOUTH HALF OF SECTION 32, TOWNSHIP 13 SOUTH, RANGE 65 WEST OF THE 6TH P.M., EL PASO COUNTY, COLORADO

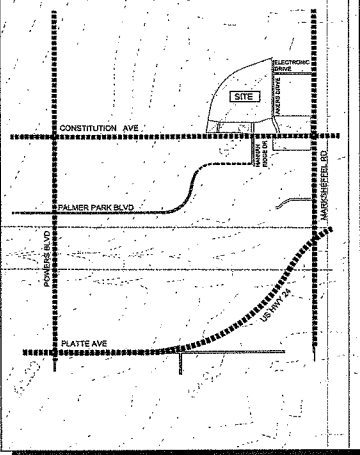
LAND OWNER: EL PASO COUNTY
 ADDRESS: 27 E PASO COUNTY COLORADO SPRINGS, CO 80903

CHD=N68°35'02"E 107.82'
 Δ=3°04'24" R=2010.08'
 L=107.81'

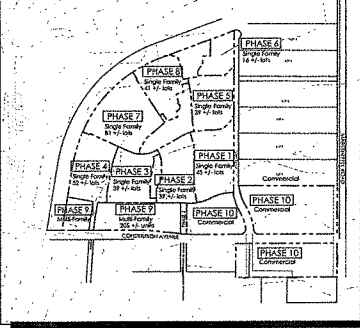
ZONE: M
 LAND OWNER: D & K ACKERS LLC
 ADDRESS: 2875 AKERS DR COLORADO SPRINGS, CO PO BOX 38517 COLORADO SPRINGS, CO

NOTES
 **ALL GRADES THROUGH INTERSECTIONS ARE 4.0% OR LESS
 **UNLESS OTHERWISE NOTED ALL CURVE ANGLES ARE 90°00'00"

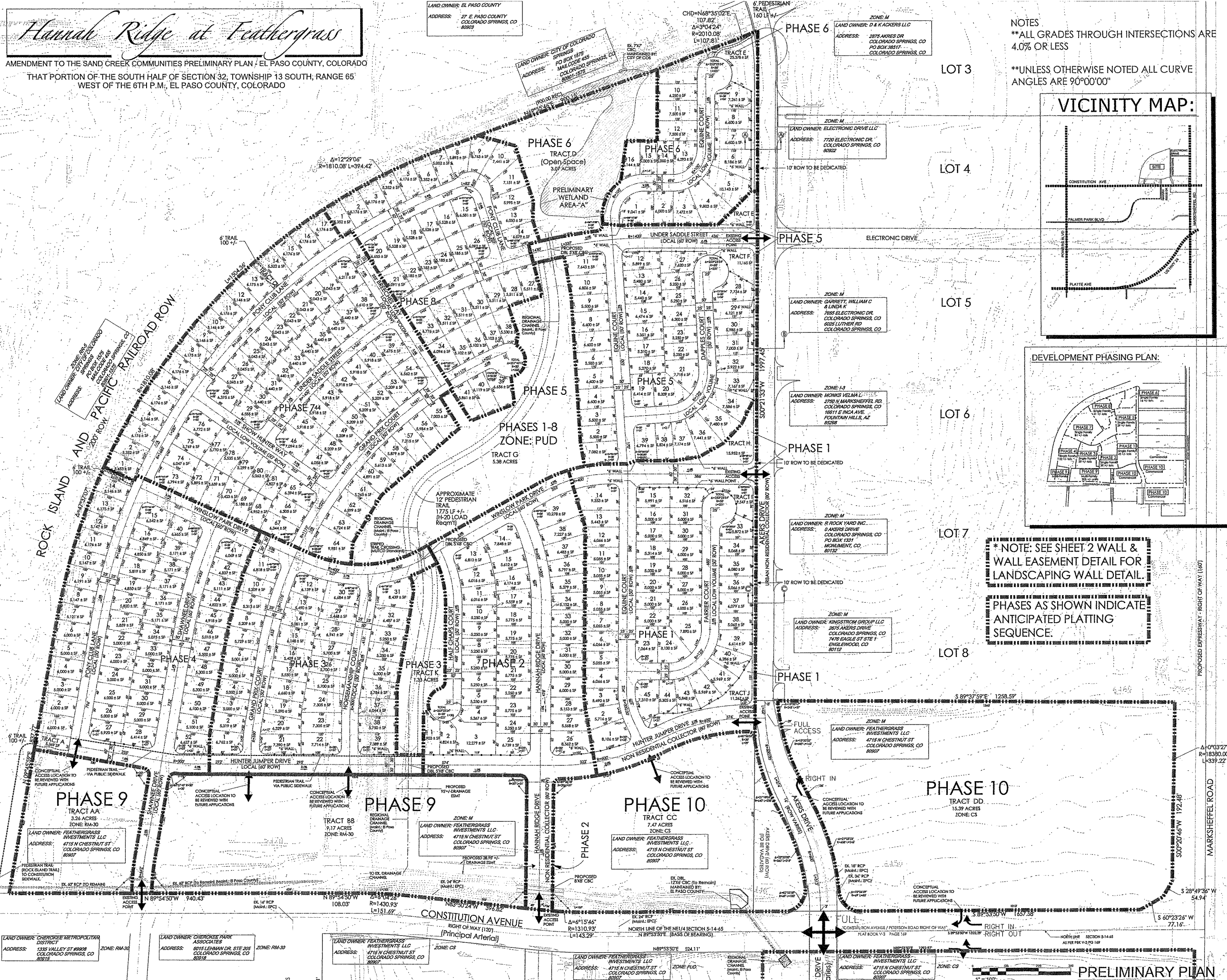
VICINITY MAP:



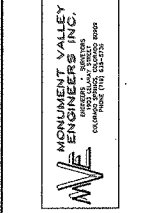
DEVELOPMENT PHASING PLAN:



* NOTE: SEE SHEET 2 WALL & WALL EASEMENT DETAIL FOR LANDSCAPING WALL DETAIL.
 PHASES AS SHOWN INDICATE ANTICIPATED PLATTING SEQUENCE.



SHEET: 1 OF 2



LAND OWNER: CHEROKEE METROPOLITAN DISTRICT ASSOCIATES ADDRESS: 1335 VALLEY ST #809 COLORADO SPRINGS, CO 80915 ZONE: RM-30
 LAND OWNER: CHEROKEE PARK ASSOCIATES ADDRESS: 6015 LEHMAN DR. STE 305 COLORADO SPRINGS, CO 80918 ZONE: RM-30
 LAND OWNER: FEATHERGRASS INVESTMENTS LLC ADDRESS: 4715 N CHESTNUT ST COLORADO SPRINGS, CO 80907 ZONE: CS
 LAND OWNER: FEATHERGRASS INVESTMENTS LLC ADDRESS: 4715 N CHESTNUT ST COLORADO SPRINGS, CO 80907 ZONE: PUD
 LAND OWNER: FEATHERGRASS INVESTMENTS LLC ADDRESS: 4715 N CHESTNUT ST COLORADO SPRINGS, CO 80907 ZONE: CS
 LAND OWNER: FEATHERGRASS INVESTMENTS LLC ADDRESS: 4715 N CHESTNUT ST COLORADO SPRINGS, CO 80907 ZONE: CS

PRELIMINARY PLAN

SP-13-006

LSC Transportation Consultants, Inc.
 545 E. Pikes Peak Ave., #210

LSC Transportation Consultants, Inc. Colorado Springs, CO 80906 **File Name : Akers Dr - Constitution AM**
 (719) 633-2868 **Site Code : 00174210**
Start Date : 03/15/2017

Page No : 1

Groups Printed- Unshifted

Start Time	Akers Dr From North				Constitution Ave From East				From South				Constitution Ave From West				Int. Total	
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	7	0	6	0	12	93	0	0	0	0	0	0	0	113	4	1		236
06:45 AM	8	0	7	0	19	114	0	1	0	0	0	0	0	123	18	0		290
Total	15	0	13	0	31	207	0	1	0	0	0	0	0	236	22	1		526
07:00 AM	18	0	10	0	6	130	0	2	0	0	0	0	0	102	8	0		276
07:15 AM	24	0	13	0	3	171	0	0	0	0	0	0	0	121	27	0		359
07:30 AM	32	0	12	0	8	190	0	0	0	0	0	0	0	108	36	0		386
07:45 AM	33	0	9	0	13	166	0	0	0	0	0	0	0	100	23	0		344
Total	107	0	44	0	30	657	0	2	0	0	0	0	0	431	94	0		1365
08:00 AM	23	0	7	0	10	131	0	0	0	0	0	0	0	132	13	0		316
08:15 AM	5	0	11	0	5	104	0	0	0	0	0	0	0	103	8	0		236
Grand Total	150	0	75	0	76	1099	0	3	0	0	0	0	0	902	137	1		2443
Apprch %	66.7	0.0	33.3	0.0	6.5	93.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	86.7	13.2	0.1		
Total %	6.1	0.0	3.1	0.0	3.1	45.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	36.9	5.6	0.0		

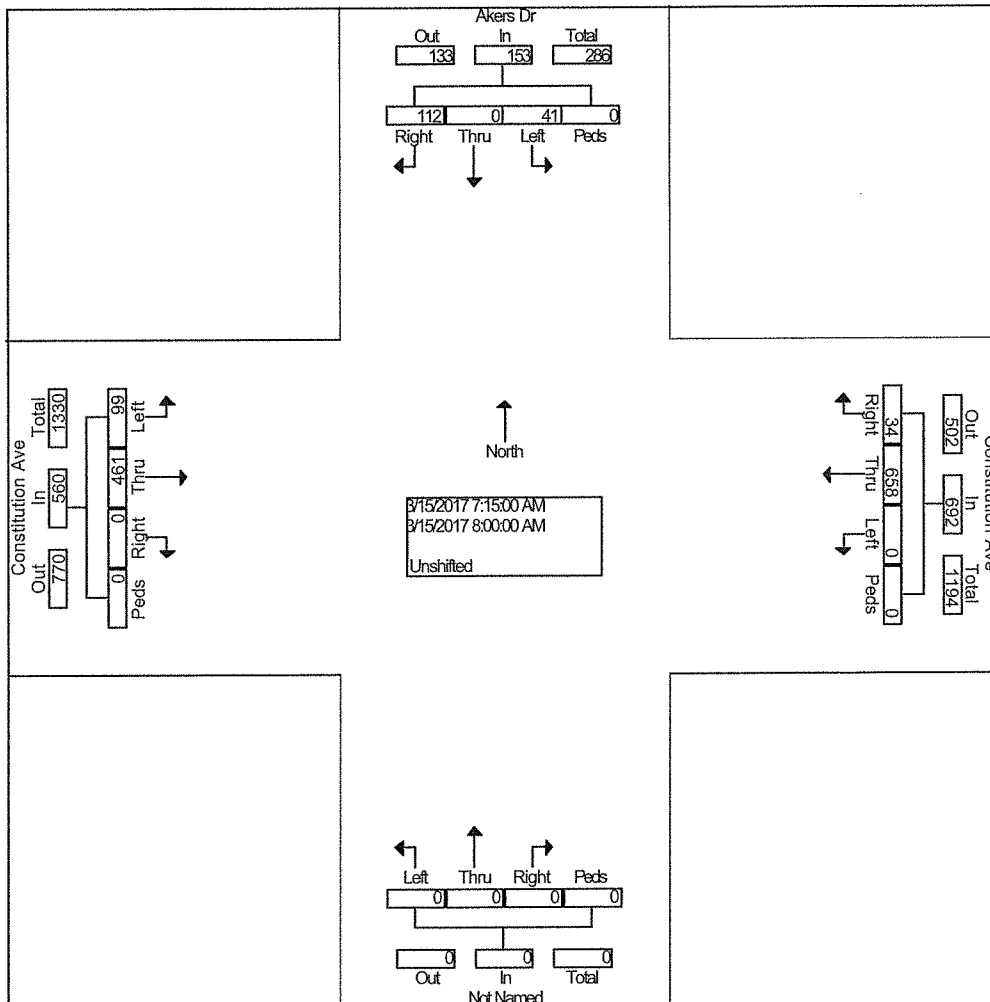
LSC Transportation Consultants, Inc.
 545 E. Pikes Peak Ave., #210
 Colorado Springs, CO 80905
 (719) 633-2868

File Name : Akers Dr - Constitution AM
 Site Code : 00174210
 Start Date : 03/15/2017
 Page No : 2

Start Time	Akers Dr From North					Constitution Ave From East					From South					Constitution Ave From West					Int. Total
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	

Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1

Intersection	07:15 AM																				
Volume	112	0	41	0	153	34	658	0	0	692	0	0	0	0	0	0	461	99	0	560	1405
Percent	73.2	0.0	26.8	0.0		4.9	95.1	0.0	0.0		0.0	0.0	0.0	0.0		0.0	82.3	17.7	0.0		
07:30 Volume	32	0	12	0	44	8	190	0	0	198	0	0	0	0	0	0	108	36	0	144	386
Peak Factor	0.869					0.874					0.946					0.910					
High Int.	07:30 AM																				
Volume	32	0	12	0	44	8	190	0	0	198	0	0	0	0	0	0	121	27	0	148	
Peak Factor	0.869					0.874					0.946					0.910					



LSC Transportation Consultants, Inc.
 545 E. Pikes Peak Ave., #210

LSC Transportation Consultants, Inc. Colorado Springs, CO 80905
 (719) 633-2868

File Name : Akers Dr - Constitution PM
 Site Code : 00174210
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 Page No : 1

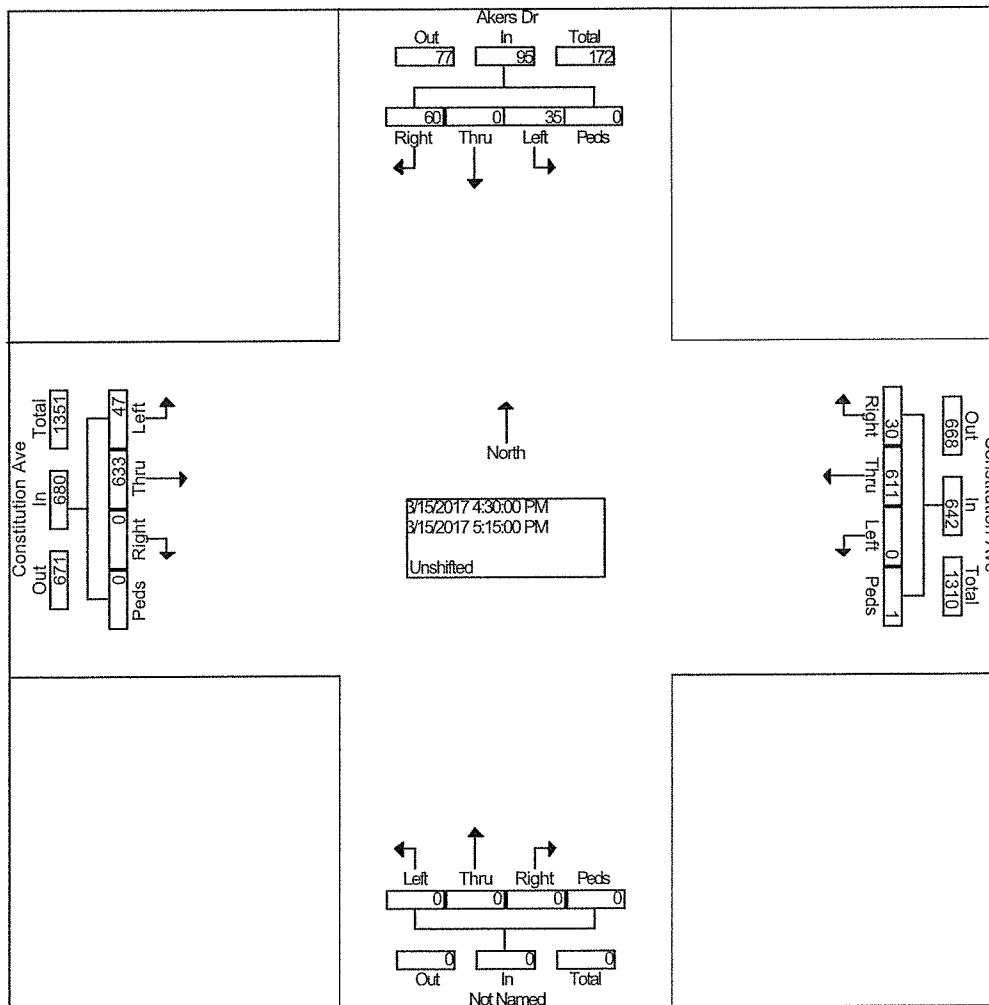
Groups Printed- Unshifted

Start Time	Akers Dr From North				Constitution Ave From East				From South				Constitution Ave From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	30	0	14	0	22	127	0	1	0	0	0	0	0	174	21	0	389
04:15 PM	7	0	9	0	16	163	0	0	0	0	0	0	0	151	16	0	362
04:30 PM	7	0	3	0	7	161	0	0	0	0	0	0	0	151	8	0	337
04:45 PM	6	0	5	0	6	138	0	0	0	0	0	0	0	151	15	0	321
Total	50	0	31	0	51	589	0	1	0	0	0	0	0	627	60	0	1409
05:00 PM	35	0	18	0	7	156	0	1	0	0	0	0	0	156	12	0	385
05:15 PM	12	0	9	0	10	156	0	0	0	0	0	0	0	175	12	0	374
05:30 PM	13	0	5	0	3	127	0	1	0	0	0	0	0	169	11	0	329
05:45 PM	3	0	3	0	3	126	0	1	0	0	0	0	0	146	9	0	291
Total	63	0	35	0	23	565	0	3	0	0	0	0	0	646	44	0	1379
Grand Total	113	0	66	0	74	1154	0	4	0	0	0	0	0	1273	104	0	2788
Apprch %	63.1	0.0	36.9	0.0	6.0	93.7	0.0	0.3	0.0	0.0	0.0	0.0	0.0	92.4	7.6	0.0	
Total %	4.1	0.0	2.4	0.0	2.7	41.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	45.7	3.7	0.0	

LSC Transportation Consultants, Inc.
 545 E. Pikes Peak Ave., #210
 Colorado Springs, CO 80905
 (719) 633-2868

File Name : Akers Dr - Constitution PM
 Site Code : 00174210
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 Page No : 2

Start Time	Akers Dr From North					Constitution Ave From East					From South					Constitution Ave From West					Int. Total
	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	60	0	35	0	95	30	61	0	1	642	0	0	0	0	0	0	63	47	0	680	1417
Percent	63.2	0.0	36.8	0.0		4.7	95.2	0.0	0.2		0.0	0.0	0.0	0.0		0.0	93.1	6.9	0.0		
05:00 Volume	35	0	18	0	53	7	15	0	1	164	0	0	0	0	0	0	15	12	0	168	385
Peak Factor																					
High Int.	05:00 PM					04:30 PM					3:45:00 PM					05:15 PM					0.920
Volume	35	0	18	0	53	7	16	0	0	168	0	0	0	0	0	0	17	12	0	187	
Peak Factor	0.44					0.95										0.90					9



LSC Transportation Consultants, Inc.
 545 E. Pikes Peak Ave., #210

LSC Transportation Consultants, Inc. Colorado Springs, CO 80905 File Name : Akers Dr - Constitution AM
 (719) 633-2868 Site Code : 00174210
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Page No : 1

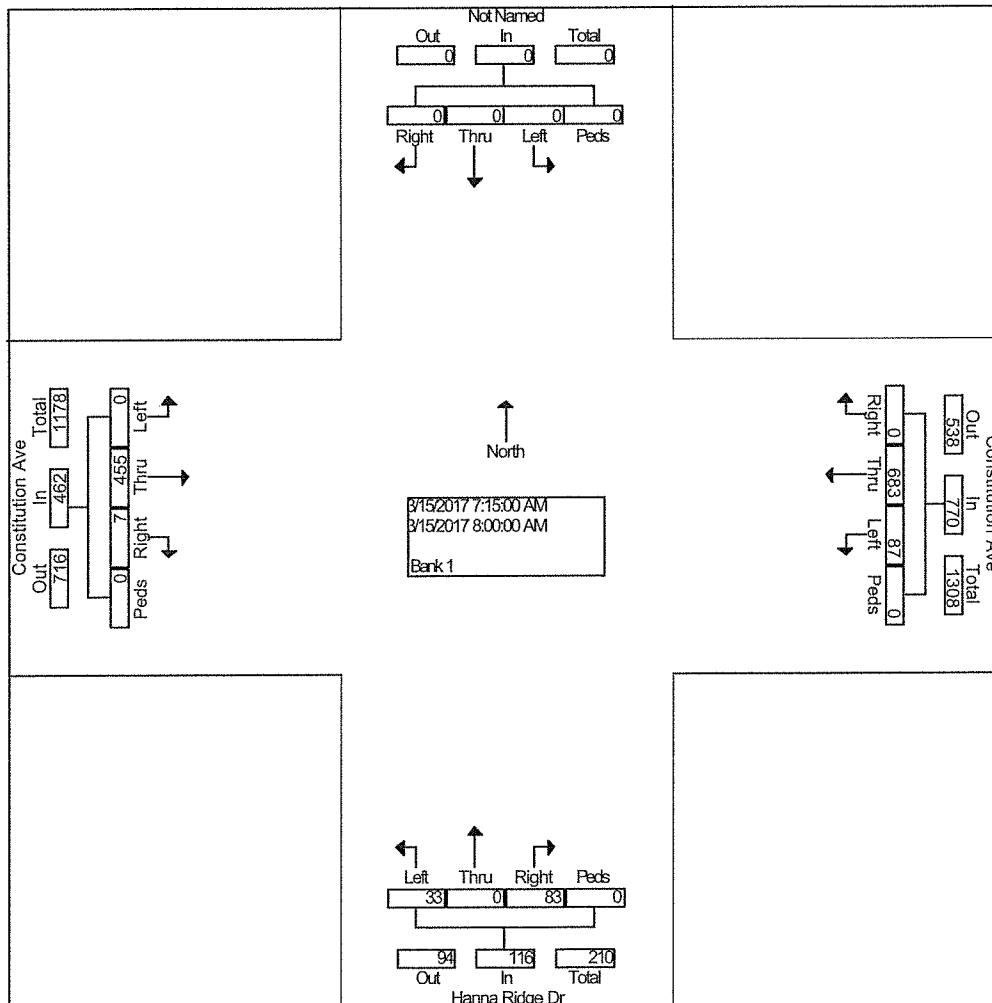
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	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	0	0	0	98	6	0	9	0	9	0	6	112	0	0	240
06:45 AM	0	0	0	0	0	107	15	0	20	0	8	0	2	113	0	0	265
Total	0	0	0	0	0	205	21	0	29	0	17	0	8	225	0	0	505
07:00 AM	0	0	0	0	0	136	12	0	15	0	13	0	1	114	0	0	291
07:15 AM	0	0	0	0	0	177	18	0	25	0	11	0	1	118	0	0	350
07:30 AM	0	0	0	0	0	204	18	0	26	0	6	0	0	104	0	0	358
07:45 AM	0	0	0	0	0	173	26	0	15	0	7	0	3	110	0	0	334
Total	0	0	0	0	0	690	74	0	81	0	37	0	5	446	0	0	1333
08:00 AM	0	0	0	0	0	129	25	0	17	0	9	0	3	123	0	0	306
08:15 AM	0	0	0	0	0	101	8	0	20	0	7	0	8	100	0	0	244
Grand Total	0	0	0	0	0	1125	128	0	147	0	70	0	24	894	0	0	2388
Apprch %	0.0	0.0	0.0	0.0	0.0	89.8	10.2	0.0	67.7	0.0	32.3	0.0	2.6	97.4	0.0	0.0	
Total %	0.0	0.0	0.0	0.0	0.0	47.1	5.4	0.0	6.2	0.0	2.9	0.0	1.0	37.4	0.0	0.0	

LSC Transportation Consultants, Inc.
 545 E. Pikes Peak Ave., #210
 Colorado Springs, CO 80906
 (719) 633-2868

File Name : Akers Dr - Constitution AM
 Site Code : 00174210
 Start Date : 03/15/2017
 Page No : 2

Start Time	From North					Constitution Ave From East					Hanna Ridge Dr From South					Constitution Ave From West					Int. Total
	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	0	0	0	0	0	0	68	87	0	770	83	0	33	0	116	7	45	0	0	462	1348
Percent	0.0	0.0	0.0	0.0		0.0	88.7	11.3	0.0		71.6	0.0	28.4	0.0		1.5	98.5	0.0	0.0		
07:30 Volume	0	0	0	0	0	0	20	18	0	222	26	0	6	0	32	0	10	0	0	104	358
Peak Factor	0.941																				
High Int.	6:15:00 AM					07:30 AM					07:15 AM					08:00 AM					
Volume	0	0	0	0	0	0	20	18	0	222	25	0	11	0	36	3	12	0	0	126	
Peak Factor	0.86										0.80					0.91					
	7										6					7					



LSC Transportation Consultants, Inc.
 545 E. Pikes Peak Ave., #210

LSC Transportation Consultants, Inc. Colorado Springs, CO 80906
 (719) 633-2868

File Name : Akers Dr - Constitution PM
 Site Code : 00174210
 Start Date : 03/15/2017
 Page No : 1

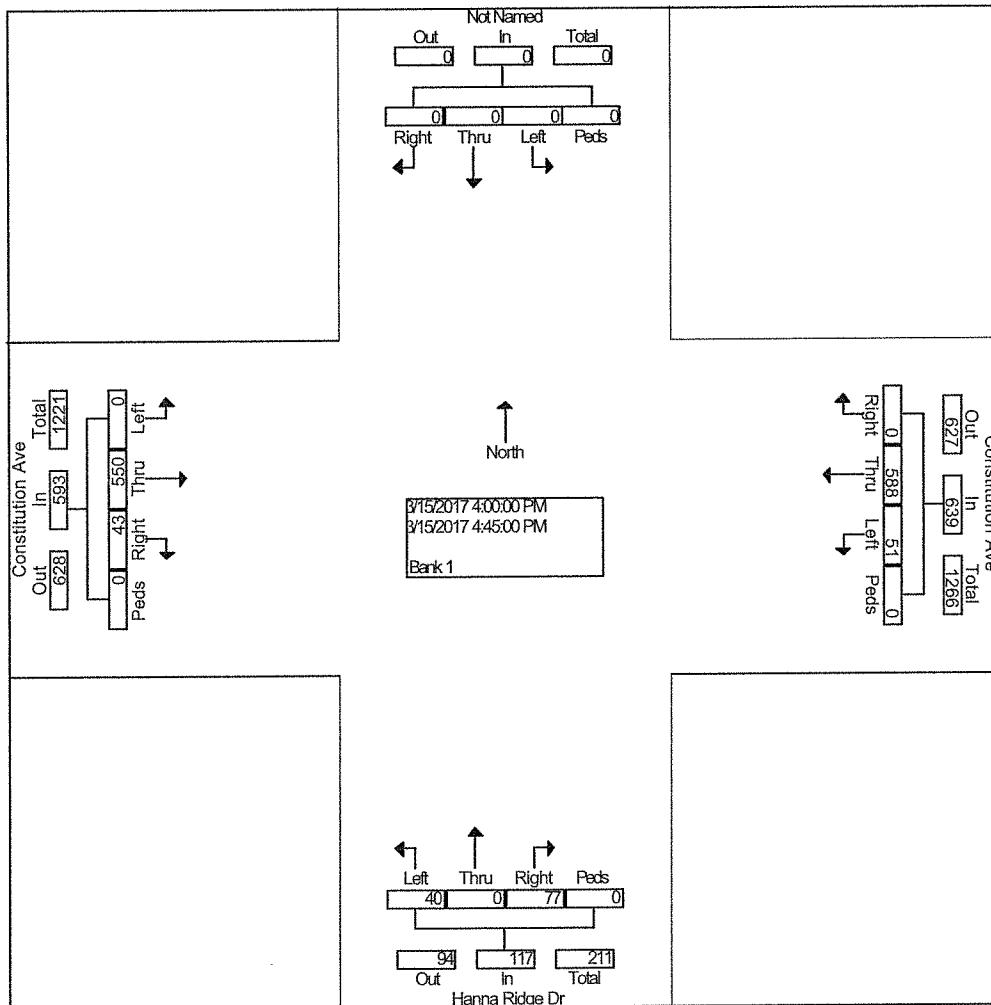
Groups Printed- Bank 1

Start Time	From North				Constitution Ave From East				Hanna Ridge Dr From South				Constitution Ave From West				Int. Total	
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	0	0	0	0	0	142	15	0	25	0	6	0	10	149	0	0	0	347
04:15 PM	0	0	0	0	0	154	16	0	17	0	9	0	9	134	0	0	0	339
04:30 PM	0	0	0	0	0	155	13	0	14	0	14	0	8	137	0	0	0	341
04:45 PM	0	0	0	0	0	137	7	0	21	0	11	0	16	130	0	0	0	322
Total	0	0	0	0	0	588	51	0	77	0	40	0	43	550	0	0	0	1349
05:00 PM	0	0	0	0	0	173	18	0	15	0	8	0	13	14	0	0	0	241
05:15 PM	0	0	0	0	0	158	10	0	21	0	10	0	13	154	0	0	0	366
05:30 PM	0	0	0	0	0	134	16	0	17	0	6	0	19	152	0	0	0	344
05:45 PM	0	0	0	0	0	119	10	0	9	0	6	0	6	157	0	0	0	307
Total	0	0	0	0	0	584	54	0	62	0	30	0	51	477	0	0	0	1258
Grand Total	0	0	0	0	0	1172	105	0	139	0	70	0	94	1027	0	0	0	2607
Apprch %	0.0	0.0	0.0	0.0	0.0	91.8	8.2	0.0	66.5	0.0	33.5	0.0	8.4	91.6	0.0	0.0	0.0	
Total %	0.0	0.0	0.0	0.0	0.0	45.0	4.0	0.0	5.3	0.0	2.7	0.0	3.6	39.4	0.0	0.0	0.0	

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File Name : Akers Dr - Constitution PM
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 Start Date : 03/15/2017
 Page No : 2

Start Time	From North					Constitution Ave From East					Hanna Ridge Dr From South					Constitution Ave From West					Int. Total
	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:00 PM																				
Volume	0	0	0	0	0	0	58	51	0	639	77	0	40	0	117	43	55	0	0	593	1349
Percent	0.0	0.0	0.0	0.0		0.0	92.0	8.0	0.0		65.8	0.0	34.2	0.0		7.3	92.7	0.0	0.0		
04:00 Volume	0	0	0	0	0	0	14	15	0	157	25	0	6	0	31	10	14	0	0	159	347
Peak Factor																					
High Int.	3:45:00 PM					04:15 PM					04:45 PM					04:00 PM					
Volume	0	0	0	0	0	0	15	16	0	170	21	0	11	0	32	10	14	0	0	159	0.972
Peak Factor											0.94					0.91					0.93
											0					4					2



Intersection

Int Delay, s/veh 1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑↑	↑	↑
Traffic Vol, veh/h	477	7	87	683	33	83
Future Vol, veh/h	477	7	87	683	33	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	185	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	87	87	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	477	7	100	785	36	91

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	477	0	991	239
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	514	-
Critical Hdwy	-	-	4.14	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	2.22	-	3.67	3.32
Pot Cap-1 Maneuver	-	-	1082	-	276	762
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	532	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1082	-	250	762
Mov Cap-2 Maneuver	-	-	-	-	250	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	250	762	-	-	1082	-
HCM Lane V/C Ratio	0.145	0.12	-	-	0.092	-
HCM Control Delay (s)	21.8	10.4	-	-	8.7	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.4	-	-	0.3	-

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘ ↑↑↑		↑↑ ↘		↘ ↗	
Traffic Vol, veh/h	99	461	658	34	41	112
Future Vol, veh/h	99	461	658	34	41	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	0	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	475	756	39	47	129

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	756	0	1150
Stage 1	-	-	756
Stage 2	-	-	394
Critical Hdwy	4.14	-	6.29
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	6.04
Follow-up Hdwy	2.22	-	3.67
Pot Cap-1 Maneuver	851	-	223
Stage 1	-	-	413
Stage 2	-	-	615
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	851	-	196
Mov Cap-2 Maneuver	-	-	196
Stage 1	-	-	413
Stage 2	-	-	541

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	29.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	851	-	-	-	196	-
HCM Lane V/C Ratio	0.12	-	-	-	0.24	-
HCM Control Delay (s)	9.8	-	-	-	29.1	0
HCM Lane LOS	A	-	-	-	D	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.9	-

Intersection

Int Delay, s/veh 1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑↑	↑	↑
Traffic Vol, veh/h	603	43	51	620	40	77
Future Vol, veh/h	603	43	51	620	40	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	185	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	100	100	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	648	46	51	620	43	82

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	648
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	934
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	934
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	258	672	-	-	934	-
HCM Lane V/C Ratio	0.165	0.122	-	-	0.055	-
HCM Control Delay (s)	21.7	11.1	-	-	9.1	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.4	-	-	0.2	-

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘ ↑↑↑		↑↑	↗	↘	↗
Traffic Vol, veh/h	47	633	611	30	35	60
Future Vol, veh/h	47	633	611	30	35	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	0	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	98	98	45	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	633	623	31	78	133

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	623	0	970
Stage 1	-	-	623
Stage 2	-	-	347
Critical Hdwy	4.14	-	6.29
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	6.04
Follow-up Hdwy	2.22	-	3.67
Pot Cap-1 Maneuver	954	-	284
Stage 1	-	-	482
Stage 2	-	-	651
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	954	-	270
Mov Cap-2 Maneuver	-	-	270
Stage 1	-	-	482
Stage 2	-	-	619

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	23.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	954	-	-	-	270	-
HCM Lane V/C Ratio	0.049	-	-	-	0.288	-
HCM Control Delay (s)	9	-	-	-	23.6	0
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	-

Intersection

Int Delay, s/veh 1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑↑	↓	↑
Traffic Vol, veh/h	512	7	87	715	33	83
Future Vol, veh/h	512	7	87	715	33	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	185	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	87	87	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	512	7	100	822	36	91

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	512	0	1041	256
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	529	-
Critical Hdwy	-	-	4.14	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	2.22	-	3.67	3.32
Pot Cap-1 Maneuver	-	-	1050	-	258	743
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1050	-	233	743
Mov Cap-2 Maneuver	-	-	-	-	233	-
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	472	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	233	743	-	-	1050	-
HCM Lane V/C Ratio	0.156	0.123	-	-	0.095	-
HCM Control Delay (s)	23.3	10.5	-	-	8.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.4	-	-	0.3	-

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘ ↑↑↑	↑↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	95	500	700	32	32	102
Future Vol, veh/h	95	500	700	32	32	102
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	0	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	515	805	37	37	117

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	805	0	1207
Stage 1	-	-	805
Stage 2	-	-	402
Critical Hdwy	4.14	-	6.99
Critical Hdwy Stg 1	-	-	6.54
Critical Hdwy Stg 2	-	-	6.74
Follow-up Hdwy	2.22	-	3.67
Pot Cap-1 Maneuver	815	-	164
Stage 1	-	-	333
Stage 2	-	-	563
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	815	-	149
Mov Cap-2 Maneuver	-	-	149
Stage 1	-	-	293
Stage 2	-	-	495

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	36.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	815	-	-	-	149	-
HCM Lane V/C Ratio	0.12	-	-	-	0.247	-
HCM Control Delay (s)	10	-	-	-	36.9	0
HCM Lane LOS	B	-	-	-	E	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.9	-

Intersection

Int Delay, s/veh 1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑↑	↑	↑
Traffic Vol, veh/h	633	43	51	652	40	77
Future Vol, veh/h	633	43	51	652	40	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	185	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	100	100	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	681	46	51	652	43	82

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	681	0	1044	340
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	363	-
Critical Hdwy	-	-	4.14	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	2.22	-	3.67	3.32
Pot Cap-1 Maneuver	-	-	907	-	257	656
Stage 1	-	-	-	-	451	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	907	-	243	656
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	451	-
Stage 2	-	-	-	-	602	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	15.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	243	656	-	-	907	-
HCM Lane V/C Ratio	0.175	0.125	-	-	0.056	-
HCM Control Delay (s)	22.9	11.3	-	-	9.2	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.4	-	-	0.2	-

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘ ↑↑↑	↑↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	35	675	650	22	29	53
Future Vol, veh/h	35	675	650	22	29	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	0	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	98	98	45	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	675	663	22	64	118

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	663	0	1003
Stage 1	-	-	663
Stage 2	-	-	340
Critical Hdwy	4.14	-	6.29
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	6.04
Follow-up Hdwy	2.22	-	3.67
Pot Cap-1 Maneuver	922	-	272
Stage 1	-	-	460
Stage 2	-	-	656
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	922	-	262
Mov Cap-2 Maneuver	-	-	262
Stage 1	-	-	460
Stage 2	-	-	631

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	23.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	922	-	-	-	262	-
HCM Lane V/C Ratio	0.038	-	-	-	0.246	-
HCM Control Delay (s)	9.1	-	-	-	23.2	0
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9	-

Intersection

Int Delay, s/veh 2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↗		↘	↑	↗
Traffic Vol, veh/h	10	512	7	87	715	4	33	1	83	9	3	31
Future Vol, veh/h	10	512	7	87	715	4	33	1	83	9	3	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	300	-	0	185	-	0	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	100	100	87	87	92	91	92	91	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	512	7	100	822	4	36	1	91	10	3	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	822	0	0	512	0	0	1147	1556	256	1300	1556	411
Stage 1	-	-	-	-	-	-	534	534	-	1022	1022	-
Stage 2	-	-	-	-	-	-	613	1022	-	278	534	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	803	-	-	1050	-	-	154	112	743	119	112	590
Stage 1	-	-	-	-	-	-	498	523	-	253	312	-
Stage 2	-	-	-	-	-	-	446	312	-	705	523	-
Platoon blocked, %		-	-		-	-		-	-		-	-
Mov Cap-1 Maneuver	803	-	-	1050	-	-	130	100	743	95	100	590
Mov Cap-2 Maneuver	-	-	-	-	-	-	130	100	-	95	100	-
Stage 1	-	-	-	-	-	-	491	516	-	250	282	-
Stage 2	-	-	-	-	-	-	376	282	-	609	516	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.9	20.1	21.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	130	691	803	-	-	1050	-	-	95	100	590
HCM Lane V/C Ratio	0.279	0.134	0.014	-	-	0.095	-	-	0.103	0.033	0.057
HCM Control Delay (s)	43.1	11	9.5	-	-	8.8	-	-	47.2	42.2	11.5
HCM Lane LOS	E	B	A	-	-	A	-	-	E	E	B
HCM 95th %tile Q(veh)	1.1	0.5	0	-	-	0.3	-	-	0.3	0.1	0.2

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘ ↑↑↑		↑↑ ↘		↘ ↘	
Traffic Vol, veh/h	95	509	704	36	46	102
Future Vol, veh/h	95	509	704	36	46	102
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	0	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	525	809	41	53	117

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	809	0	1215
Stage 1	-	-	809
Stage 2	-	-	406
Critical Hdwy	4.14	-	6.29
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	6.04
Follow-up Hdwy	2.22	-	3.67
Pot Cap-1 Maneuver	812	-	205
Stage 1	-	-	388
Stage 2	-	-	606
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	812	-	180
Mov Cap-2 Maneuver	-	-	180
Stage 1	-	-	388
Stage 2	-	-	533

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	33.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	812	-	-	-	180	-
HCM Lane V/C Ratio	0.121	-	-	-	0.294	-
HCM Control Delay (s)	10	-	-	-	33.1	0
HCM Lane LOS	B	-	-	-	D	A
HCM 95th %tile Q(veh)	0.4	-	-	-	1.2	-

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↗		↘	↑	↗
Traffic Vol, veh/h	35	633	43	51	652	14	40	4	77	6	2	20
Future Vol, veh/h	35	633	43	51	652	14	40	4	77	6	2	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	300	-	0	185	-	0	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	93	93	100	100	92	94	94	94	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	681	46	51	652	15	43	4	82	7	2	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	652	0	0	681	0	0	1186	1511	340	1173	1511	326
Stage 1	-	-	-	-	-	-	757	757	-	754	754	-
Stage 2	-	-	-	-	-	-	429	754	-	419	757	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	930	-	-	907	-	-	144	119	656	147	119	670
Stage 1	-	-	-	-	-	-	366	414	-	367	415	-
Stage 2	-	-	-	-	-	-	574	415	-	582	414	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	930	-	-	907	-	-	127	108	656	116	108	670
Mov Cap-2 Maneuver	-	-	-	-	-	-	127	108	-	116	108	-
Stage 1	-	-	-	-	-	-	351	397	-	352	392	-
Stage 2	-	-	-	-	-	-	521	392	-	483	397	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.7	24.4	18.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	127	525	930	-	-	907	-	-	116	108	670
HCM Lane V/C Ratio	0.335	0.164	0.041	-	-	0.056	-	-	0.056	0.02	0.032
HCM Control Delay (s)	47	13.2	9	-	-	9.2	-	-	37.9	39	10.6
HCM Lane LOS	E	B	A	-	-	A	-	-	E	E	B
HCM 95th %tile Q(veh)	1.3	0.6	0.1	-	-	0.2	-	-	0.2	0.1	0.1

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘ ↑↑↑		↑↑	↗	↘	↗
Traffic Vol, veh/h	35	681	664	25	35	53
Future Vol, veh/h	35	681	664	25	35	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	0	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	98	98	45	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	681	678	26	78	118

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	678	0	1020
Stage 1	-	-	678
Stage 2	-	-	342
Critical Hdwy	4.14	-	6.29
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	6.04
Follow-up Hdwy	2.22	-	3.67
Pot Cap-1 Maneuver	910	-	265
Stage 1	-	-	452
Stage 2	-	-	655
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	910	-	255
Mov Cap-2 Maneuver	-	-	255
Stage 1	-	-	452
Stage 2	-	-	630

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	25.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	910	-	-	-	255	-
HCM Lane V/C Ratio	0.038	-	-	-	0.305	-
HCM Control Delay (s)	9.1	-	-	-	25.2	0
HCM Lane LOS	A	-	-	-	D	A
HCM 95th %tile Q(veh)	0.1	-	-	-	1.2	-

Timings
2: Hannah Ridge & Constitution

2040 Total Traffic
AM Peak Hour

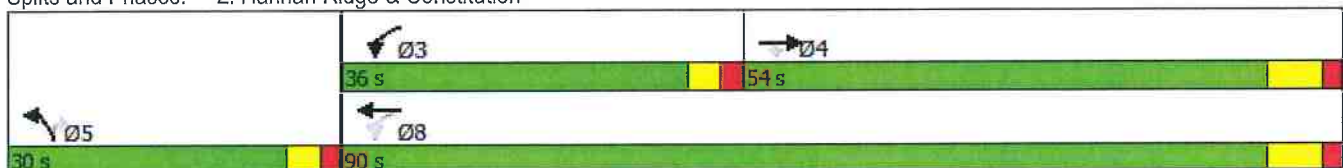
	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗	↙	↑↑↑	↖	↗
Traffic Volume (vph)	952	213	256	857	206	198
Future Volume (vph)	952	213	256	857	206	198
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	5	
Permitted Phases		4	8			5
Defector Phase	4	4	3	8	5	5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	9.0	22.0	9.0	9.0
Total Split (s)	54.0	54.0	36.0	90.0	30.0	30.0
Total Split (%)	45.0%	45.0%	30.0%	75.0%	25.0%	25.0%
Yellow Time (s)	5.0	5.0	3.0	5.0	3.0	3.0
All-Red Time (s)	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	-1.0
Total Lost Time (s)	7.0	7.0	5.0	7.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Min	Min	None	Min	None	None
Act Effct Green (s)	18.8	18.8	35.3	33.2	9.6	10.6
Actuated g/C Ratio	0.34	0.34	0.64	0.60	0.17	0.19
v/c Ratio	0.58	0.33	0.58	0.29	0.36	0.44
Control Delay	16.6	3.9	10.6	5.5	23.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	3.9	10.6	5.5	23.4	7.4
LOS	B	A	B	A	C	A
Approach Delay	14.3			6.7	15.6	
Approach LOS	B			A	B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 55.1
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 11.3
 Intersection Capacity Utilization 52.6%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: Hannah Ridge & Constitution



Intersection

Int Delay, s/veh 1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↓	↑↑↑		↑
Traffic Vol, veh/h	1070	50	60	1003	0	95
Future Vol, veh/h	1070	50	60	1003	0	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	285	420	-	-	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	1126	53	63	1056	0	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1126	0	-	563
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	5.34	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.12	-	-	3.92
Pot Cap-1 Maneuver	-	-	340	-	0	402
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	340	-	-	402
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	402	-	-	340	-
HCM Lane V/C Ratio	0.249	-	-	0.186	-
HCM Control Delay (s)	16.9	-	-	18	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	1	-	-	0.7	-

Timings
5: Akers & Constitution

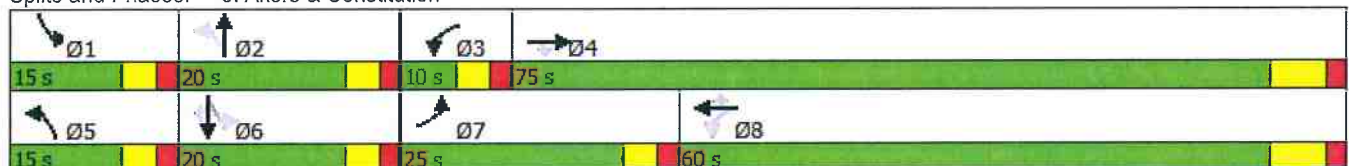
2040 Total Traffic
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	78	998	74	24	911	60	31	6	140	7	171
Future Volume (vph)	78	998	74	24	911	60	31	6	140	7	171
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4	8		8	2		6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	23.0	23.0	9.0	23.0	23.0	9.0	15.0	9.0	20.0	20.0
Total Split (s)	25.0	75.0	75.0	10.0	60.0	60.0	15.0	20.0	15.0	20.0	20.0
Total Split (%)	20.8%	62.5%	62.5%	8.3%	50.0%	50.0%	12.5%	16.7%	12.5%	16.7%	16.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None
Act Effct Green (s)	7.5	24.9	24.9	25.1	19.3	19.3	11.8	6.9	15.4	12.2	12.2
Actuated g/C Ratio	0.13	0.43	0.43	0.43	0.33	0.33	0.20	0.12	0.27	0.21	0.21
v/c Ratio	0.18	0.48	0.10	0.08	0.57	0.10	0.10	0.29	0.21	0.02	0.38
Control Delay	28.3	14.1	2.1	8.4	19.0	0.3	17.8	13.0	17.6	25.6	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	14.1	2.1	8.4	19.0	0.3	17.8	13.0	17.6	25.6	8.1
LOS	C	B	A	A	B	A	B	B	B	C	A
Approach Delay		14.3			17.7			14.5		12.6	
Approach LOS		B			B			B		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 57.8
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 15.4
 Intersection Capacity Utilization 47.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 5: Akers & Constitution



Timings
2: Hannah Ridge & Constitution

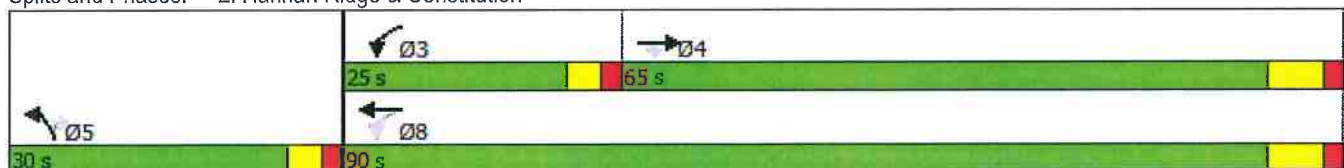
2040 Background Traffic
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗	↙	↑↑↑	↖↙	↗
Traffic Volume (vph)	1260	75	157	1041	204	200
Future Volume (vph)	1260	75	157	1041	204	200
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	5	
Permitted Phases		4	8			5
Detector Phase	4	4	3	8	5	5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	9.0	22.0	9.0	9.0
Total Split (s)	65.0	65.0	25.0	90.0	30.0	30.0
Total Split (%)	54.2%	54.2%	20.8%	75.0%	25.0%	25.0%
Yellow Time (s)	5.0	5.0	3.0	5.0	3.0	3.0
All-Red Time (s)	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	-1.0
Total Lost Time (s)	7.0	7.0	5.0	7.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Min	Min	None	Min	None	None
Act Effct Green (s)	23.6	23.6	38.4	36.4	9.7	10.8
Actuated g/C Ratio	0.40	0.40	0.66	0.62	0.17	0.18
v/c Ratio	0.65	0.12	0.45	0.35	0.38	0.46
Control Delay	15.8	3.7	8.6	5.6	25.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	3.7	8.6	5.6	25.0	7.7
LOS	B	A	A	A	C	A
Approach Delay	15.1			6.0	16.5	
Approach LOS	B			A	B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 58.4
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 11.6
 Intersection Capacity Utilization 53.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: Hannah Ridge & Constitution



Intersection

Int Delay, s/veh 0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑		↑
Traffic Vol, veh/h	1285	10	50	1195	0	50
Future Vol, veh/h	1285	10	50	1195	0	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	285	420	-	-	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	1353	11	53	1258	0	53

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	676
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	5.34	7.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.12	3.92
Pot Cap-1 Maneuver	-	263	339
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	263	339
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	17.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	339	-	-	263	-
HCM Lane V/C Ratio	0.155	-	-	0.2	-
HCM Control Delay (s)	17.6	-	-	22.1	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	0.5	-	-	0.7	-

Timings
5: Akers & Constitution

2040 Background Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	291	1113	56	19	1023	216	24	4	78	5	151
Future Volume (vph)	291	1113	56	19	1023	216	24	4	78	5	151
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4	8		8	2				6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	23.0	23.0	9.0	23.0	23.0	9.0	15.0	9.0	20.0	20.0
Total Split (s)	21.0	60.0	60.0	12.0	51.0	51.0	10.0	18.0	30.0	38.0	38.0
Total Split (%)	17.5%	50.0%	50.0%	10.0%	42.5%	42.5%	8.3%	15.0%	25.0%	31.7%	31.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None
Act Effct Green (s)	12.2	36.8	36.8	31.4	23.2	23.2	10.3	6.6	7.5	12.7	12.7
Actuated g/C Ratio	0.18	0.53	0.53	0.45	0.33	0.33	0.15	0.10	0.11	0.18	0.18
v/c Ratio	0.51	0.43	0.06	0.06	0.63	0.33	0.11	0.28	0.22	0.01	0.37
Control Delay	31.4	12.2	0.1	7.7	22.1	4.4	24.1	16.1	34.0	30.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	12.2	0.1	7.7	22.1	4.4	24.1	16.1	34.0	30.0	7.7
LOS	C	B	A	A	C	A	C	B	C	C	A
Approach Delay		15.5			18.8			18.5		16.9	
Approach LOS		B			B			B		B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 69.3

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 17.1

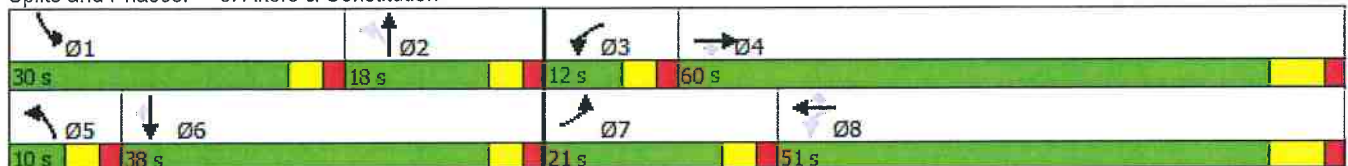
Intersection LOS: B

Intersection Capacity Utilization 51.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 5: Akers & Constitution



Queuing and Blocking Report

Intersection: 2: Hannah Ridge & Constitution

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	L
Maximum Queue (ft)	32	341	265	327	47	150	160	180	186	29	178	143
Average Queue (ft)	8	106	70	124	14	72	39	56	73	3	97	32
95th Queue (ft)	27	257	196	296	40	129	112	139	161	18	155	87
Link Distance (ft)		1111	1111	1111			772	772	772		513	513
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300				300	275				250		
Storage Blk Time (%)		0		1								
Queuing Penalty (veh)		0		1								

Intersection: 2: Hannah Ridge & Constitution

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	190	80	50	48
Average Queue (ft)	86	26	18	13
95th Queue (ft)	160	59	43	31
Link Distance (ft)	513	378	378	378
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Shawnee & Constitution

Movement	EB	EB	WB	NB	SB
Directions Served	L	R	L	R	R
Maximum Queue (ft)	60	4	77	60	69
Average Queue (ft)	15	0	19	22	27
95th Queue (ft)	47	3	52	47	55
Link Distance (ft)				626	682
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	335	285	420		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report

Intersection: 5: Akers & Constitution

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (ft)	247	216	158	188	346	40	55	263	241	248	132	71
Average Queue (ft)	130	76	52	54	136	10	19	102	104	113	50	25
95th Queue (ft)	220	168	120	134	284	27	49	235	223	226	106	61
Link Distance (ft)			772	772	772	772		359	359	359		
Upstream Blk Time (%)								0				
Queuing Penalty (veh)								0				
Storage Bay Dist (ft)	320	320					425				235	350
Storage Blk Time (%)								0		0		
Queuing Penalty (veh)								0		1		

Intersection: 5: Akers & Constitution

Movement	NB	SB	SB	SB	SB
Directions Served	TR	L	L	T	R
Maximum Queue (ft)	101	95	144	48	109
Average Queue (ft)	36	34	73	10	42
95th Queue (ft)	79	77	124	32	80
Link Distance (ft)	492			541	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		385	385		195
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 28: right-in/right-out & Constitution

Movement	WB	WB	WB	SB
Directions Served	T	T	R	R
Maximum Queue (ft)	11	379	124	63
Average Queue (ft)	0	14	4	18
95th Queue (ft)	8	165	91	45
Link Distance (ft)	638	638	638	265
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 2

Timings
2: Hannah Ridge & Constitution

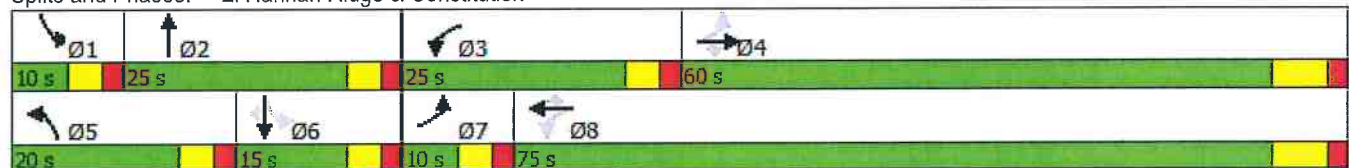
2040 Total Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	48	1142	213	295	1077	62	206	47	50	32	43
Future Volume (vph)	48	1142	213	295	1077	62	206	47	50	32	43
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8			6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	22.0	22.0	9.0	22.0	22.0	9.0	13.0	9.0	13.0	13.0
Total Split (s)	10.0	60.0	60.0	25.0	75.0	75.0	20.0	25.0	10.0	15.0	15.0
Total Split (%)	8.3%	50.0%	50.0%	20.8%	62.5%	62.5%	16.7%	20.8%	8.3%	12.5%	12.5%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None
Act Effct Green (s)	35.3	27.8	27.8	49.0	41.7	41.7	11.0	15.2	11.1	7.5	7.5
Actuated g/C Ratio	0.44	0.35	0.35	0.61	0.52	0.52	0.14	0.19	0.14	0.09	0.09
v/c Ratio	0.18	0.68	0.32	0.77	0.43	0.07	0.46	0.64	0.27	0.20	0.13
Control Delay	10.6	25.6	4.6	30.1	14.0	0.2	39.4	21.8	30.1	43.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	25.6	4.6	30.1	14.0	0.2	39.4	21.8	30.1	43.4	0.8
LOS	B	C	A	C	B	A	D	C	C	D	A
Approach Delay		21.9			16.7			29.3		23.5	
Approach LOS		C			B			C		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 80.2
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 20.8
 Intersection Capacity Utilization 76.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 2: Hannah Ridge & Constitution



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	92	1309	50	60	1241	25	0	0	95	0	0	48
Future Vol, veh/h	92	1309	50	60	1241	25	0	0	95	0	0	48
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	335	-	285	420	-	300	-	-	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	97	1378	53	63	1306	26	0	0	100	0	0	51

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	1306	0	0	1378	0	0	-	-	689	-	-	653
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	5.34	-	-	5.34	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	278	-	-	256	-	-	0	0	333	0	0	351
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	278	-	-	256	-	-	-	-	333	-	-	351
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	1.1	20.4	17
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	333	278	-	-	256	-	-	351
HCM Lane V/C Ratio	0.3	0.348	-	-	0.247	-	-	0.144
HCM Control Delay (s)	20.4	24.7	-	-	23.6	-	-	17
HCM Lane LOS	C	C	-	-	C	-	-	C
HCM 95th %tile Q(veh)	1.2	1.5	-	-	0.9	-	-	0.5

Timings
5: Akers & Constitution

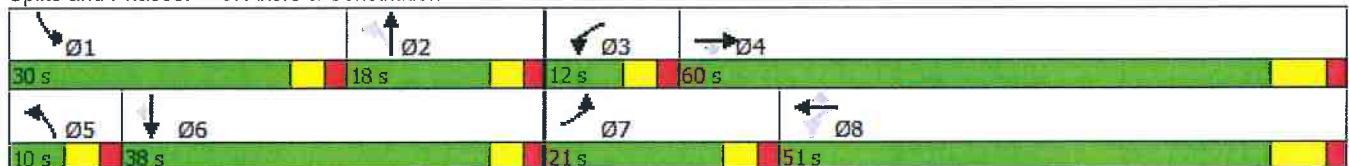
2040 Total Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	277	1021	123	141	1069	166	128	51	448	33	237
Future Volume (vph)	277	1021	123	141	1069	166	128	51	448	33	237
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4	8		8	2				6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	23.0	23.0	9.0	23.0	23.0	9.0	15.0	9.0	20.0	20.0
Total Split (s)	21.0	60.0	60.0	12.0	51.0	51.0	10.0	18.0	30.0	38.0	38.0
Total Split (%)	17.5%	50.0%	50.0%	10.0%	42.5%	42.5%	8.3%	15.0%	25.0%	31.7%	31.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None
Act Effct Green (s)	13.3	35.8	35.8	38.7	29.6	29.6	16.9	11.7	18.6	25.2	25.2
Actuated g/C Ratio	0.14	0.37	0.37	0.40	0.31	0.31	0.18	0.12	0.19	0.26	0.26
v/c Ratio	0.61	0.57	0.19	0.55	0.72	0.28	0.52	0.78	0.71	0.07	0.42
Control Delay	46.9	25.1	2.7	22.7	32.8	3.7	36.6	42.3	43.8	29.0	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	25.1	2.7	22.7	32.8	3.7	36.6	42.3	43.8	29.0	7.5
LOS	D	C	A	C	C	A	D	D	D	C	A
Approach Delay		27.4			28.2			40.2		31.2	
Approach LOS		C			C			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 95.8
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 29.6
 Intersection LOS: C
 Intersection Capacity Utilization 72.9%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Akers & Constitution



Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑	↑						↑
Traffic Vol, veh/h	0	1601	40	0	1240	263	0	0	0	0	0	137
Future Vol, veh/h	0	1601	40	0	1240	263	0	0	0	0	0	137
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	-	-	200	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	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	1685	42	0	1305	277	0	0	0	0	0	144

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	- 0 0	- - 0	- - 653
Stage 1	- - -	- - -	- - -
Stage 2	- - -	- - -	- - -
Critical Hdwy	- - -	- - -	- - 7.14
Critical Hdwy Stg 1	- - -	- - -	- - -
Critical Hdwy Stg 2	- - -	- - -	- - -
Follow-up Hdwy	- - -	- - -	- - 3.92
Pot Cap-1 Maneuver	0 - -	0 - -	0 0 351
Stage 1	0 - -	0 - -	0 0 -
Stage 2	0 - -	0 - -	0 0 -
Platoon blocked, %	- - -	- - -	- - -
Mov Cap-1 Maneuver	- - -	- - -	- - 351
Mov Cap-2 Maneuver	- - -	- - -	- - -
Stage 1	- - -	- - -	- - -
Stage 2	- - -	- - -	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	22.2
HCM LOS			C

Minor Lane/Major Mvmt	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	351
HCM Lane V/C Ratio	-	-	-	-	0.411
HCM Control Delay (s)	-	-	-	-	22.2
HCM Lane LOS	-	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	-	1.9

Queuing and Blocking Report

Intersection: 2: Hannah Ridge & Constitution

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	L
Maximum Queue (ft)	77	350	278	341	132	245	186	210	227	56	194	167
Average Queue (ft)	27	117	94	137	41	127	57	82	99	13	104	43
95th Queue (ft)	62	271	232	292	93	214	145	179	196	40	168	115
Link Distance (ft)		1111	1111	1111			772	772	772		513	513
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300				300	275				250		
Storage Blk Time (%)		1		1		0			0			
Queuing Penalty (veh)		0		2		0			0			

Intersection: 2: Hannah Ridge & Constitution

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	305	87	97	60
Average Queue (ft)	133	31	24	15
95th Queue (ft)	258	69	66	37
Link Distance (ft)	513		378	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		75		75
Storage Blk Time (%)		2	0	0
Queuing Penalty (veh)		1	0	0

Intersection: 4: Shawnee & Constitution

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	R	L	R	R	R
Maximum Queue (ft)	120	4	4	75	4	107	58
Average Queue (ft)	41	0	0	20	0	39	23
95th Queue (ft)	90	3	3	53	3	82	47
Link Distance (ft)		2014				626	682
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	335		285	420	300		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Intersection: 5: Akers & Constitution

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (ft)	183	144	239	237	360	67	157	281	262	263	95	156
Average Queue (ft)	110	71	103	113	174	20	63	142	139	150	37	65
95th Queue (ft)	173	129	215	222	329	48	123	254	238	252	73	124
Link Distance (ft)			772	772	772	772		359	359	359		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	320	320					425				235	350
Storage Blk Time (%)										2		
Queuing Penalty (veh)										3		

Intersection: 5: Akers & Constitution

Movement	NB	SB	SB	SB	SB
Directions Served	TR	L	L	T	R
Maximum Queue (ft)	289	209	232	50	152
Average Queue (ft)	136	105	143	14	62
95th Queue (ft)	252	177	208	39	112
Link Distance (ft)	492			541	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		385	385		195
Storage Blk Time (%)	0				0
Queuing Penalty (veh)	0				0

Intersection: 28: right-in/right-out & Constitution

Movement	WB	WB	SB
Directions Served	T	R	R
Maximum Queue (ft)	386	116	117
Average Queue (ft)	14	4	49
95th Queue (ft)	168	85	93
Link Distance (ft)	638	638	265
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 7

Markup Summary

dsdrice (4)



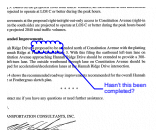
Subject: Callout
Page Label: 1
Lock: Unlocked
Status:
Checkmark: Unchecked
Author: dsdrice
Date: 6/14/2017 12:39:37 PM
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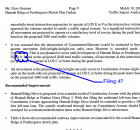
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Author: dsdrice
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The developer has to pay \$923.



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Filing 4?