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Midtown Collection at Hannah Ridge Filing No. 3 Traffic Impact Analysis (LSC #204020) May 15, 2020

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.



Developer's Statement

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

A handwritten signature in blue ink that reads 'Jan Boulton'.

MAY 15, 2020

Date



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May 14, 2020

Jim Boulton
Classic Homes
2138 Flying Horse Club Drive
Colorado Springs, CO 80921

RE: Midtown Collection
at Hannah Ridge Filing No. 3
El Paso County, CO
Traffic Impact Analysis
LSC #204020

Dear Mr. Boulton,

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the proposed Midtown Collection at Hannah Ridge Filing No. 3 residential development. As shown in Figure 1, the site is located north of Constitution Avenue between Hannah Ridge Drive and Akers Drive in El Paso County, Colorado.

REPORT CONTENTS

This report has been prepared to address the project's traffic impact at the adjacent intersections.

This report contains the following:

- The existing street and traffic conditions in the site's vicinity including the street widths, lane geometries, traffic controls, and existing traffic counts at key area intersections.
- The projected future background traffic volumes, which include estimates of traffic from other area development projects and increases in through traffic on the adjacent arterial streets.
- The estimated average weekday and peak-hour trip generation.
- The estimated directional distribution of site-generated trips and the projected site-generated traffic volumes.
- Estimates of the resulting total traffic volumes on the adjacent streets and intersections.
- The projected levels of service at the adjacent intersections.

Previous Traffic Reports Completed in the Area

A traffic impact study for the entire Hannah Ridge development was completed by LSC dated October 23, 2007. This report was updated September 7, 2017 as part of the final platting of the Hannah Ridge at Feathergrass Filings 3 and 4. Transportation memoranda were completed and dated March 14, 2019 as part of the submittal for Hannah Ridge at Feathergrass Filings 4, 5, 6 and 7 and August 1, 2019 as part of the submittal for Midtown Collection at Hannah Ridge Filings 1 and 2.

Appendix Table 1, which contains a list of other traffic studies in the study area completed within the past five years (that LSC is aware of), is attached for reference. This study accounts for the land use, trip generation, and the roadway network included in these studies.

LAND USE AND ACCESS

Land Use

The overall Hannah Ridge development is planned to contain a mix of residential and commercial uses at buildout.

The Hannah Ridge at Feathergrass subdivision is located west of Akers Drive and north of Hunter Jumper Drive. It is planned to contain 344 lots for single-family homes. The 2017 study assumed the site would be developed with 355 lots for single-family homes. At the time traffic counts were conducted, 108 homes had been constructed within these filings.

The approved Midtown Collection at Hannah Ridge Filings 1 and 2 are located west of Hannah Ridge Drive between Constitution Avenue and Hunter Jumper Drive. These two filings contain 89 lots for single-family homes. The 2007 and 2017 traffic impact studies assumed this area would be developed with about 205 multifamily dwelling units.

The currently proposed Midtown Collection at Hannah Ridge Filing 3 is located east of Hannah Ridge Drive between Constitution Avenue and Hunter Jumper Drive. Filing 3 is planned to contain 42 lots for single-family homes. The 2007 and 2017 traffic impact studies assumed this area would be developed with commercial land uses.

The remaining Hannah Ridge sketch plan parcels on the northeast and southeast corners of the intersection of Akers/Constitution are planned to be developed for commercial uses. These parcels are planned to be designed and developed as demand dictates.

The parcels on the southwest and southeast corners of the intersection of Hannah Ridge/Constitution, which are not a part of the Hannah Ridge Sketch Plan area, are planned to be developed with 96 paired homes. The 2007 and 2017 traffic impact studies and the 2019 transportation memorandum assumed these parcels would be developed with commercial land uses.

Access

Access to the Midtown Collection at Hannah Ridge Filing 3 is proposed to Hunter Jumper Drive about 321 feet east of Hannah Ridge Drive and 376 feet west of Akers Drive aligning with Equine Court.

Pedestrian and Bicycle Access

The following was included as a condition of approval for the Midtown Collection at Hannah Ridge Filings 1 and 2. It is anticipated that a similar condition will be required for the currently proposed Filing 3.

Street right-of-way's and entries will also be landscaped as indicated on the PUD Plan. The landscaping, wall and open space tracts are to be installed by the Developer of the project and will be maintained by the Midtown Collection at Hannah Ridge Homeowners Association. Access the western adjacent trail network is provided via a connection at the northwest corner of the site. Proposed sidewalks within the two filings will all provide connection to the trail access. This community will be providing all sidewalk along its perimeter street frontage, including all ADA pedestrian ramps for intersecting streets and a pedestrian ramp on the west side of the Constitution Blvd. and Hannah Ridge Dr. intersection that will facilitate a future Constitution Blvd. crossing once the signal is warranted and installed and additional sidewalk is installed with adjacent development on the south side of Constitution Blvd. Pedestrian crossing of this arterial intersection is not proposed at this time due to safety concerns related to crossing a currently unsignalized intersection and no receiving facilities being present. Similarly, the Shawnee Drive and Constitution Blvd. intersection recently reconstructed as a ¾ movement intersection will not be signalized, so pedestrian crossing at this location is not proposed due to safety concerns. In addition, there are no perimeter sidewalks, pedestrian ramps or curb and gutter along the perimeter of the existing Cimarron East Ridge Park. The closest signalized intersections for crossing Constitution Blvd. are at Peterson Road or Marksheffel Road.

STREET AND TRAFFIC CONDITIONS

Area Streets

The adjacent streets are shown in Figure 1 and are described below. Copies of the 2016 El Paso County Major Transportation Corridors Plan (MTCP) 2040 Roadway Plan and 2016 MTCP 2060 Corridor Preservation Plan with the site location identified on them have been attached to this report.

- **Constitution Avenue** is a Principal Arterial adjacent to the site extending from Paseo Road east to US Highway 24 (US Hwy 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 just north of Constitution Avenue. 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 4 shows the peak-hour traffic volumes, lane geometries, and traffic controls at the intersections of Constitution/Hannah Ridge and Constitution/Akers. The traffic volumes at the intersection of Constitution/Hannah Ridge are based on manual turning-movement counts by LSC conducted in February 2019. The turning movements at the intersection of Constitution/Akers are based on manual turning movement counts conducted by LSC in March 2017. The through traffic volumes at this intersection have been adjusted based on the 2019 traffic count conducted at Hannah Ridge. The traffic count reports are attached.

Existing Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A 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
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) ⁽¹⁾
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more
(1) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.		

The intersections of Constitution/Hannah Ridge and Constitution/Akers been analyzed based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. Figure 3 shows the level of service analysis results.

The northbound and southbound left-turn movements at the intersection of Constitution/Hannah Ridge are currently operating at LOS F during the peak hours.

The southbound left-turn movement at the intersection of Constitution/Akers is currently operating at LOS E during the peak hours.

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 no additional traffic generated by development of the Midtown Collection at Hannah Ridge Filing No. 3.

Figure 4 shows the projected background traffic volumes for the short term. These background traffic volumes have been based on the existing traffic volumes (from Figure 2) plus estimates of additional traffic due to buildout of Hannah Ridge at Feathergrass Filings 1 through 7, the Midtown Collection at Hannah Ridge Filings 1 and 2, and 96 paired homes to be located southeast and southwest of the intersection of Constitution/Hannah Ridge. Through traffic on Constitution Avenue has been increased based on an annual growth rate of two percent per year for five years.

Figure 5 shows the projected 2040 background traffic volumes. These volumes are based on the short-term background traffic volumes plus estimates of additional traffic due to buildout of the Hannah Ridge Sketch Plan area commercial parcels, the Wilshire development located south of Constitution/Hannah Ridge and development of currently vacant parcels along Akers Drive between Constitution Avenue and North Carefree Circle. Through traffic on Constitution Avenue has been increased based on an annual growth rate of two percent per year.

TRIP GENERATION

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the average weekday and peak-hour trip generation estimates.

The site is projected to generate about 396 new vehicle-trips on the average weekday, with about half entering and half exiting the site. This is about 1,894 fewer trips than were estimated in the 2007 and 2017 Hannah Ridge Sketch Plan traffic impact studies. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 8 vehicles would enter and 23 vehicles would exit the site. During the afternoon peak hour, which generally occurs for

one hour between 4:15 and 6:15 p.m., about 26 vehicles would enter and 15 vehicles would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated traffic volumes on the adjacent streets is an important factor in determining the site's traffic impacts. Figure 6 shows the directional distribution estimates. The estimates have been based on the following factors: the recent traffic count data; the site's location with respect to the nearby employment, commercial, and activity centers and the balance of the Colorado Springs metropolitan area; the site's proposed land use; and the site's proposed access points.

SITE-GENERATED TRAFFIC

The site-generated traffic volumes were calculated by applying the directional distribution percentages (from Figure 6) to the trip generation estimates from Table 2. Figure 7 shows the projected site-generated traffic volumes at the adjacent intersections.

BUILDOUT TOTAL TRAFFIC

Figure 8 shows the projected short-term total traffic volumes. The short-term total traffic volumes are the sum of the short-term background traffic volumes (from Figure 4) plus the site-generated traffic volumes from Figure 7.

Figure 9 shows the projected 2040 total traffic volumes. The 2040 total traffic volumes are the sum of the 2040 background traffic volumes (from Figure 5) plus the site-generated traffic volumes from Figure 7.

PROJECTED LEVELS OF SERVICE

The intersections of Constitution/Hannah Ridge, Constitution/Akers and Hunter Jumper/Akers have been analyzed to determine the projected levels of service based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. The intersections of Constitution/Hannah Ridge and Constitution/Akers were also analyzed as traffic signal-controlled intersections using Synchro. Figures 4, 5, 8, and 9 show the results of the level of service analysis. The level of service reports are attached.

The northbound and southbound left-turn movements at the intersection of Constitution/Hannah Ridge are currently operating at LOS F during the peak hours. This intersection is planned to be signalized in the future. However, it may not meet a traffic signal warrant(s) in the short term. It is not uncommon for the minor approaches to operate at LOS E or LOS F as the traffic volumes approach the volumes where a traffic signal is warranted. Once the intersection of Constitution/Akers is signalized, it may help to create gaps in through traffic

for these movements to more easily occur. By 2040, it was assumed this intersection would be converted to traffic signal control. It was also assumed that Constitution Avenue would be widened to three through lanes in each direction as shown on the MTCP. Based on these assumptions and the projected 2040 total traffic volumes shown in Figure 9, all movements are projected to operate at LOS D or better during the peak hours.

The southbound left-turn movement at the intersection of Constitution/Akers is currently operating at LOS E during the peak hours. This movement is projected to operate at LOS F during the peak hours, based on the short-term background and total traffic volumes. This intersection is planned to be signalized in the future. However, it may not meet a traffic signal warrant(s) in the short term. It is not uncommon for the minor approaches to operate at LOS E or LOS F as the traffic volumes approach the volumes where a traffic signal is warranted. The existing traffic signal at the intersection of Constitution/Marksheffel likely creates gaps in through traffic that allow the southbound left-turn movement to occur more easily. Once the intersection of Constitution/Hannah Ridge is signalized, it may help to create even more gaps in through traffic. By 2040, it was assumed that a south leg of this intersection would be constructed and it would be converted to traffic signal control. It was also assumed that Constitution Avenue would be widened to three through lanes in each direction as shown on the MTCP and that dual eastbound and southbound left-turn lanes would be provided. Based on these assumptions and the projected 2040 total traffic volumes shown in Figure 9, all movements are projected to operate at LOS D or better during the peak hours.

The intersection of Akers/Hunter Jumper is projected to operate at LOS B or better for all movements as a stop sign-controlled intersection, based on the projected short-term total traffic volumes. By 2040, it was assumed that the commercial parcel east of Akers Drive would be developed with a full-movement access forming the east leg of this intersection. Based on the projected 2040 total traffic volumes, the westbound left-turn movement from the commercial parcel is projected to operate at LOS F during the afternoon peak hour. Alternate traffic control options may need to be considered when plans come forward for the future commercial parcel.

TRAFFIC SIGNAL WARRANT ANALYSIS

The intersection of Constitution Avenue and Hannah Ridge Drive was analyzed to determine if a traffic signal warrant, based on either vehicular volume or crash history, would be met in the short term.

Vehicular Volume Traffic Signal Warrants

The combination of major street approach volumes (which includes the sum of eastbound and westbound approach volumes) and minor street volumes (northbound and southbound approaches analyzed separately) at the subject intersection were analyzed to determine if the combination currently exceeds or would exceed the threshold criteria for Eight-Hour and/or Four-Hour Vehicular Volume Traffic Signal Warrants in the 2009 Manual on Uniform Traffic

Control Devices (MUTCD). The existing traffic volumes shown are based on manual turning-movement counts conducted by LSC in February 2019. The traffic counts are attached. The minor approach was analyzed as a single-lane approach and only the left-turn traffic volumes were included in the analysis, as the existing and projected northbound and southbound through volumes at this intersection are very low. Table 3 shows the warrant evaluation based on the existing condition, the projected short-term total traffic volumes and the projected 2040 total traffic volumes.

As shown in Table 3, the traffic volumes for only one of the eight hours analyzed currently meet the threshold for an Eight-Hour Vehicular Volume Traffic Signal Warrant. Only two additional hours are projected to meet the threshold, based on the projected short-term total traffic volumes. By 2040, all eight hours analyzed are projected to meet the threshold. All of the additional hours are projected to be met based on increases in traffic on the south leg of the intersection.

Based on the existing traffic counts, none of the eight hours analyzed are projected to meet the threshold for a Four-Hour Vehicular Volume Traffic Signal Warrant. Two hours are projected to meet the threshold based on the projected short-term total traffic volumes and five hours are projected to meet the threshold based on the projected 2040 total traffic volumes.

Warrant 7 Analysis (Crash Experience)

The following is from the MUTCD:

Support:

01 The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

Standard:

02 The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:

- A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and*
- B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and*
- C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in Table 4C-1 (see Section 4C.02), or the vph in both of the 80 percent columns of Condition B in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major-street and minor-street volumes shall be for the*

same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours. If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 56 percent columns in Table 4C-1 may be used in place of the 80 percent columns.

The Colorado State Patrol (CSP) provided LSC with crash data for the intersections of Hannah Ridge Drive and Constitution Avenue from 2016 through April 2020. CSP reported one crash in 2017 involving a northbound left-turning vehicle on Hannah Ridge Drive and a westbound vehicle on Constitution Avenue, one crash in 2018 involving two eastbound vehicles on Constitution Avenue and one crash in 2019 involving a northbound left-turning vehicle on Hannah Ridge Drive and a westbound vehicle on Constitution Avenue. The 2017 and 2019 crashes would clearly be considered susceptible to correction by a traffic control signal. The 2018 crash would likely not be considered susceptible to correction by a traffic control signal, as it was coded non-intersection related. Based on a crash history of one crash per year, item B is not met. Even if the crash history had met the criteria for item B, as shown on Table 3, item C is not projected to be met in the short term.

ROADWAY IMPROVEMENT FEES

This project will be required to participate in the El Paso County Road Improvement Fee Program. The Midtown Collection at Hannah Ridge will join the ten-mil PID. The ten-mil PID building permit fee portion associated with this option is \$1,221 per single-family dwelling unit. Based on 42 lots, the total building permit fee would be \$51,282.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- The site is projected to generate about 396 new vehicle-trips on the average weekday, with about half entering and half exiting the site. This is about 1,894 fewer trips than were estimated in the 2007 and 2017 Hannah Ridge Sketch Plan traffic impact studies. During the morning peak hour, about eight vehicles would enter and 23 vehicles would exit the site. During the afternoon peak hour, about 26 vehicles would enter and 15 vehicles would exit the site.

Projected Levels of Service

- The stop sign-controlled intersections of Constitution/Hannah Ridge and Constitution/Akers are projected to operate at LOS F for the left-turn minor approach movements, based on the projected short-term background and total traffic volumes. These intersections are planned to be signalized in the future. However, they may not meet traffic signal warrant(s) in the

short term. It is not uncommon for the minor approaches to operate at LOS E or LOS F as the traffic volumes approach the volumes where a traffic signal is warranted. If (and when) only one intersection of the two is signalized, this will likely create additional and/or more useable gaps in through traffic for these minor approach movements at the other intersection to more easily occur.

Recommended Improvement

- No additional auxiliary turn lanes would be required on Constitution Avenue and Akers Drive with the proposed Midtown Collection at Hannah Ridge Filing No. 3.

* * * * *

We trust this traffic impact analysis will assist you in gaining approval of the proposed Midtown Collection at Hannah Ridge Filing No. 3. Please contact me if you have any questions or need further assistance.

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By: Kirstin Day Ferrin, P.E.
Senior Transportation Engineer

JCH:KDF:jas

Enclosures: Tables 2-3
Appendix Table 1
Figures 1-9
MTCP Maps
Crash History
Traffic Count Reports
Level of Service Reports

Tables

Table 2
Trip Generation Estimate
Midtown Collection at Hannah Ridge Filing 3

														New External Trips Generated
Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total Trips Generated				Pass-By Trips ⁽²⁾	Average New Weekday Traffic
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour			
				In	Out	In	Out		In	Out	In	Out		
Trip Generation Estimate Based on the Currently Proposed Midtown Collection at Hannah Ridge Filing 3														
210	Single-Family Detached Housing	42 DU ⁽²⁾	9.44	0.19	0.56	0.62	0.37	396	8	23	26	15	0%	396
Trip Generation Estimate Based on Approved Sketch Plan Land Use ⁽³⁾														
820	Shopping Center	83 KSF ⁽⁴⁾	41.80	0.56	0.34	1.82	1.93	3,470	47	29	151	161	34%	2,290
Change (Decrease) in Trip Generation Estimate								-3,074	-39	-6	-125	-146		-1,894

Notes:

(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)

(2) DU = dwelling unit

(3) A portion of the trip generation estimate for Phase 10 shown in Table 2 of the *Hannah Ridge at Feathergrass Filing Nos. 3 and 4 Updated Traffic Impact analysis* by LSC September 7, 2017

(4) KSF = 1,000 square feet of floor space

Source: LSC Transportation Consultants, Inc.

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Table 3
Midtown Collection at Hannah Ridge
Traffic Signal Warrant Analysis of Hannah Ridge Drive/Constitution Avenue

Notes:

(1) Based on counts by LSC in February 2019.

(2) Constitution Avenue eastbound and westbound left-turn, through, and right-turn volumes.

(3) Minor Street Volume used in the evaluation is the higher of the projected Hannah Ridge Dr northbound or southbound left-turn volume only.

4) Thresholds are based on 2 or more lanes on the major approach and 1 lane on the minor approach. The minor approach volumes include ONLY the higher of the northbound or southbound left-turn volume as the through volume is very low. The "70% factor" criteria has been used as the major street speed exceeds 40 mph.

(5) Note: The traffic volume threshold evaluation is only one of several elements of Warrant No. 7. Please refer to the report narrative for details.

(6) Source: *Transportation Impact Study Feathergrass - Colorado Springs, Colorado* by Alridge Transportation Consultants, LLC October 25, 2019 and *Midtown Collection at Hannah Ridge Filings 1 & 2 Transportation Memorandum* by LSC Transportation Consultants, Inc. August 1, 2019

Source: LSC Transportation Consultants, Inc.

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Appendix Tables

**Appendix Table 1
Area Traffic Impact Studies
Midtown Collection at Hannah Ridge Fil 3**

Study	Consultant	Date
Hannah Ridge		
Hannah Ridge Sketch Plan Amendment/Preliminary Plan Updated Traffic Impact Analysis	LSC Transportation Consultants, Inc.	October 23, 2007
Hannah Ridge at Feathergrass Filing Nos. 3 and 4 Updated Traffic Impact Analysis	LSC Transportation Consultants, Inc.	September 7, 2017
Hannah Ridge at Feathergrass Filings 5, 6, and 7 Traffic Technical Memorandum	LSC Transportation Consultants, Inc.	March 14, 2019
Midtown Collection at Hannah Ridge Filings 1 & 2 Transportation Memorandum	LSC Transportation Consultants, Inc.	August 1, 2019
Other Area Studies		
Wilshire Filing Nos. 2 and 3 Updated Traffic Impact Analysis	LSC Transportation Consultants, Inc.	May 28, 2014
Grocery Retail (NEC Constitution & Akers) Traffic Impact Study	Kimley Horn and Associates, Inc.	August 2015
The Gardens at North Carefree Traffic Impact Study	LSC Transportation Consultants, Inc.	August 9, 2018
Transportation Impact Study Feathergrass Colorado Springs, Colorado	Aldridge Transportation Consultants, LLC	October 25, 2019
<i>Source: LSC Transportation Consultants, Inc.</i>		
Apr-20		

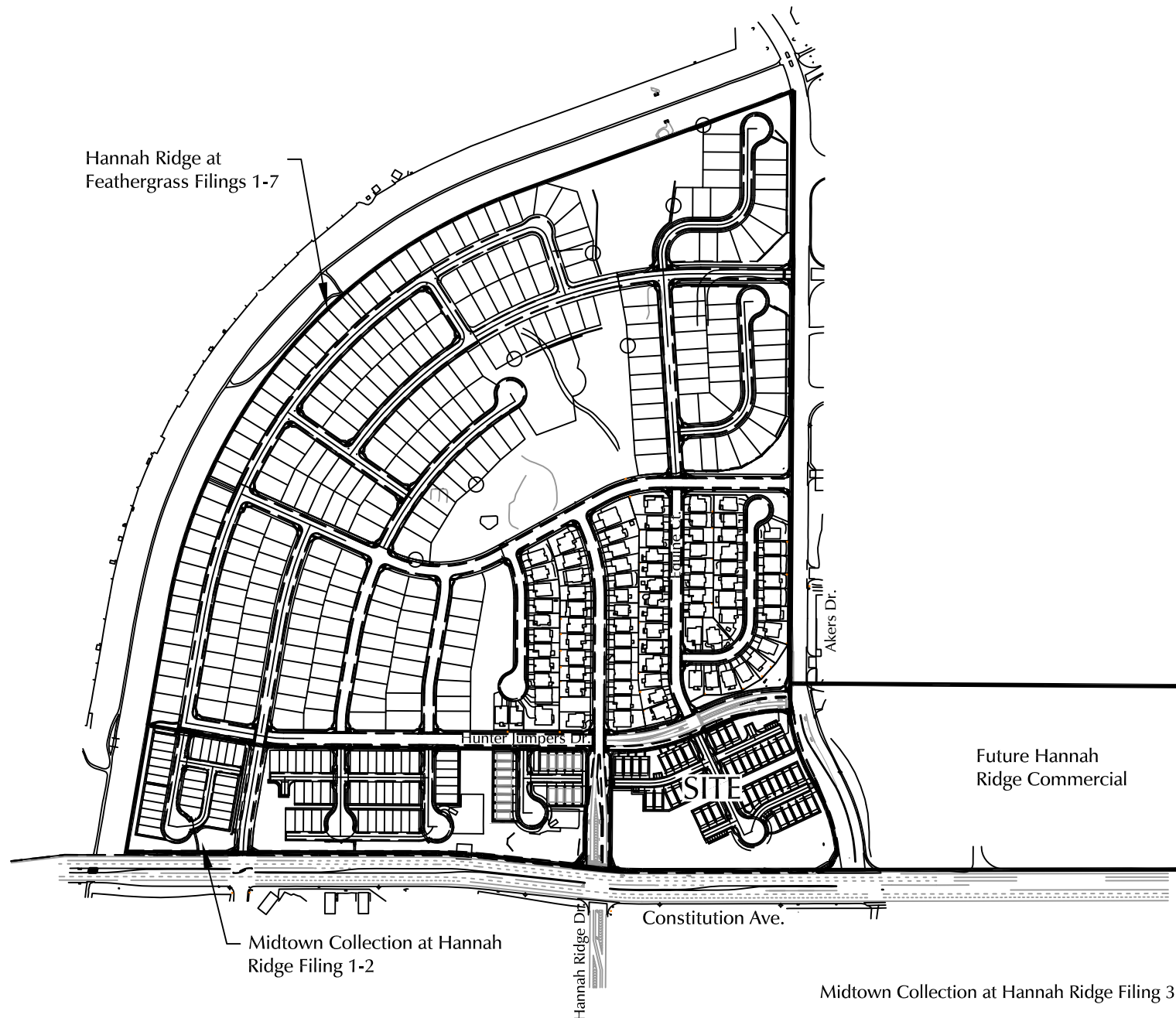
Figures



Figure 1

Vicinity Map

Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)

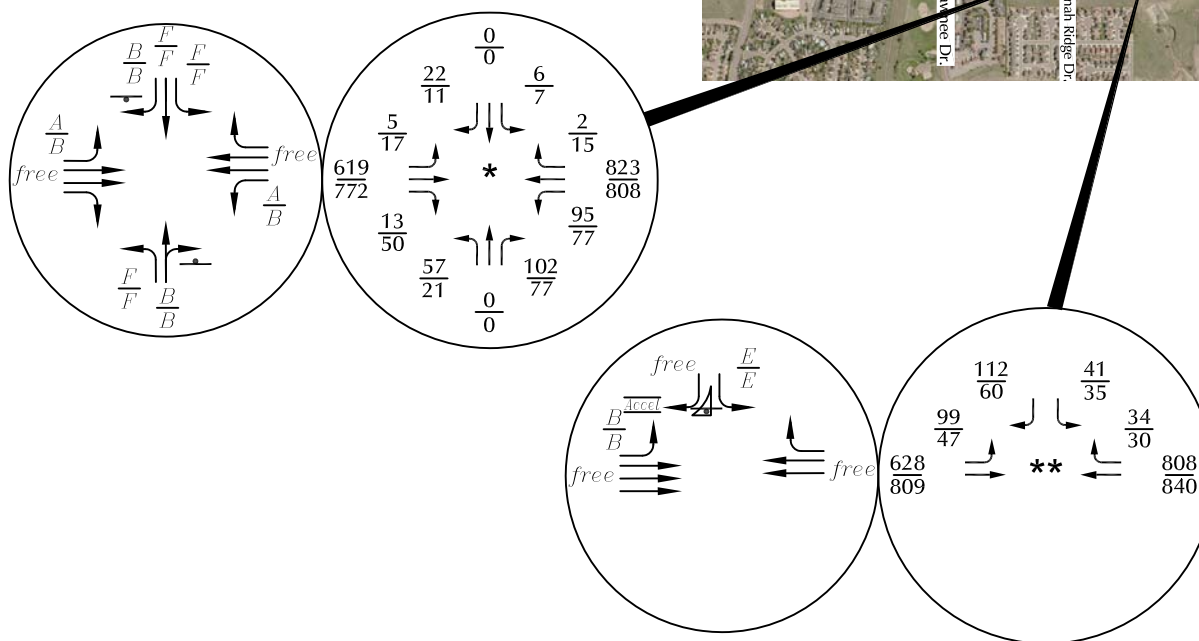
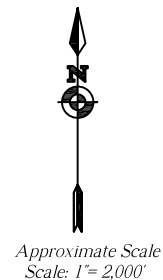
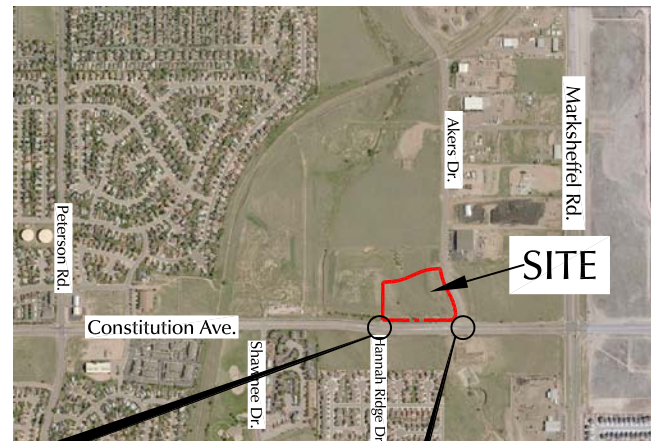


Approximate Scale
Scale: 1" = 500'

Figure 2
Site Plan

Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)

- * Based on traffic counts conducted by LSC Feb 2019
- ** Based on traffic counts conducted by LSC March 2017.
Through traffic volumes have been adjusted based on more current traffic counts at Hannah Ridge Drive.



LEGEND:

⊥ = Stop Sign

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

PM Weekday Peak-Hour Traffic (vehicles per hour)

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

PM Individual Movement Peak-Hour Level of Service



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

Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)

Figure 3

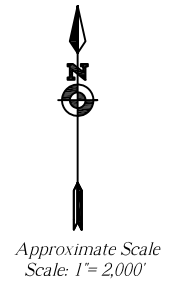
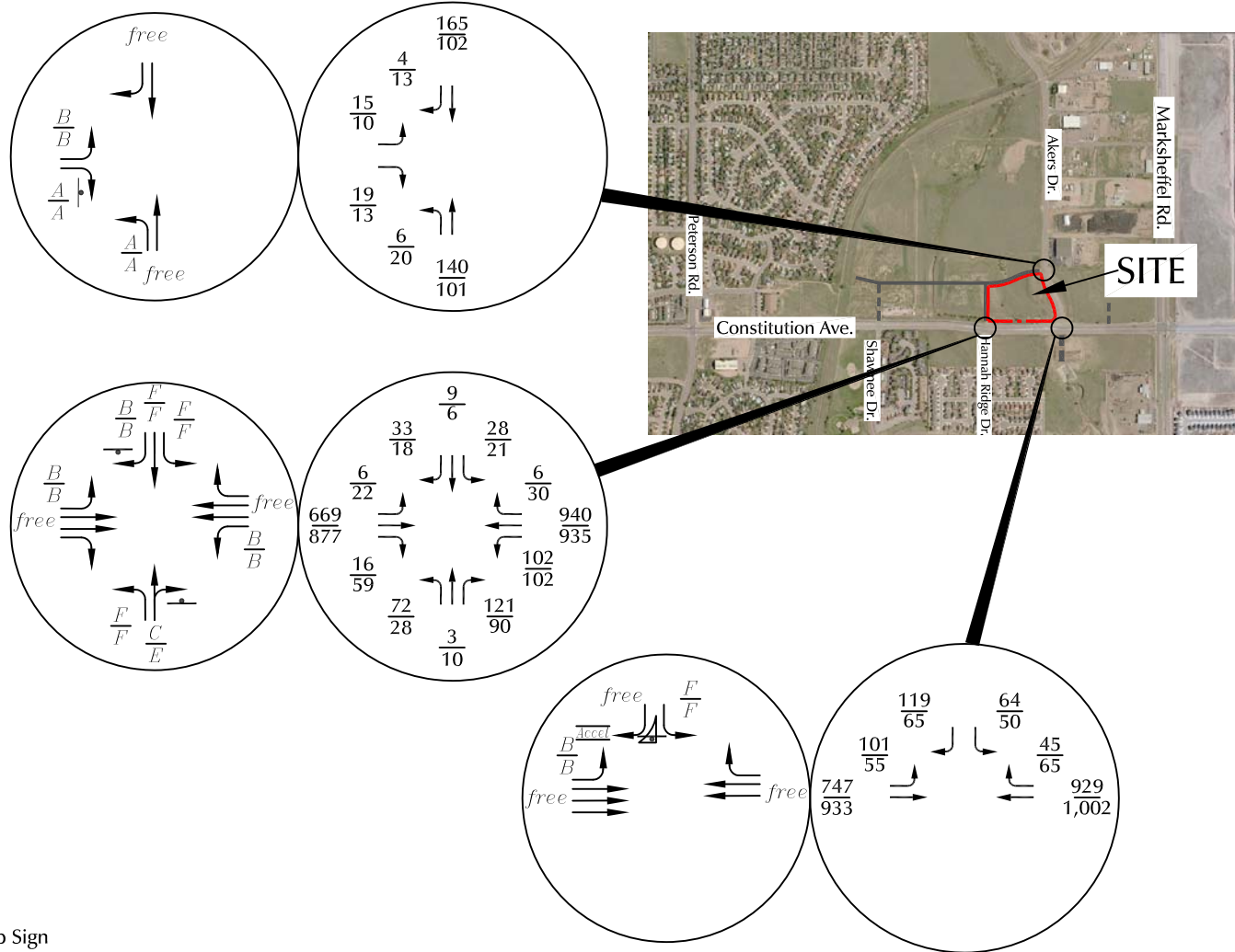
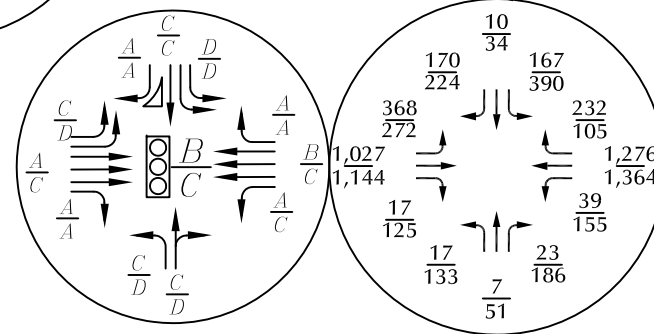
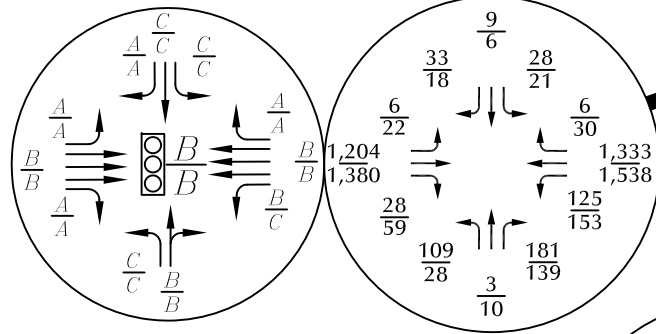
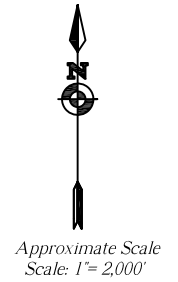
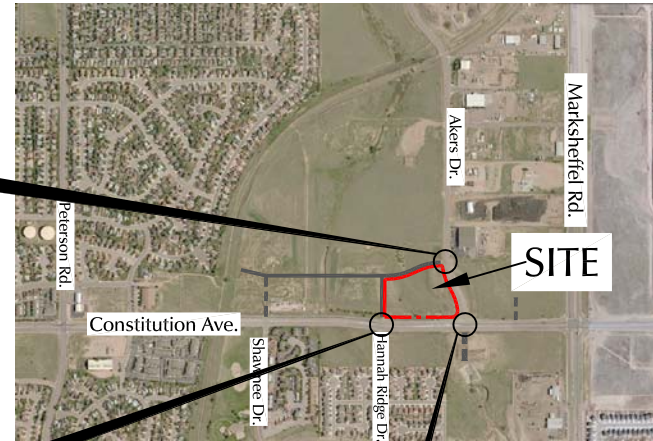
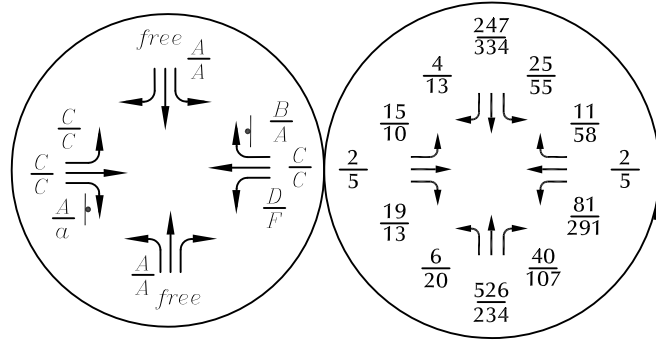


Figure 4

Short-Term Background Traffic, Lane Geometry, Traffic Control and Level of Service

Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)



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

B/B = 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



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

Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)

Figure 5



Approximate Scale
Scale: 1" = 2,000'



LEGEND:

↔
XX% = Percent Directional Distribution



Figure 6

Directional Distribution of Site-Generated Traffic

Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)

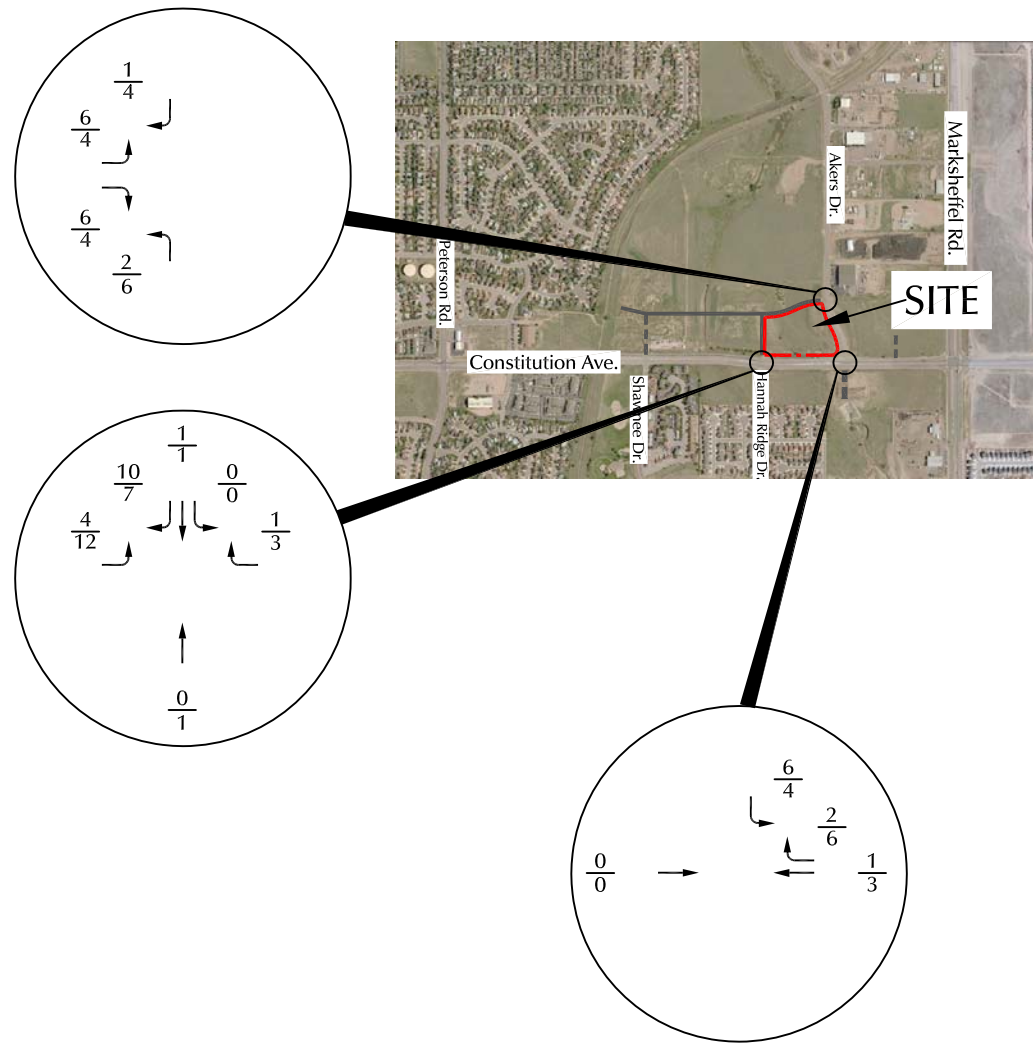


Figure 7
**Assignment of
 Site-Generated Traffic**

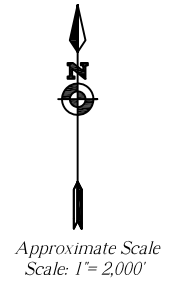
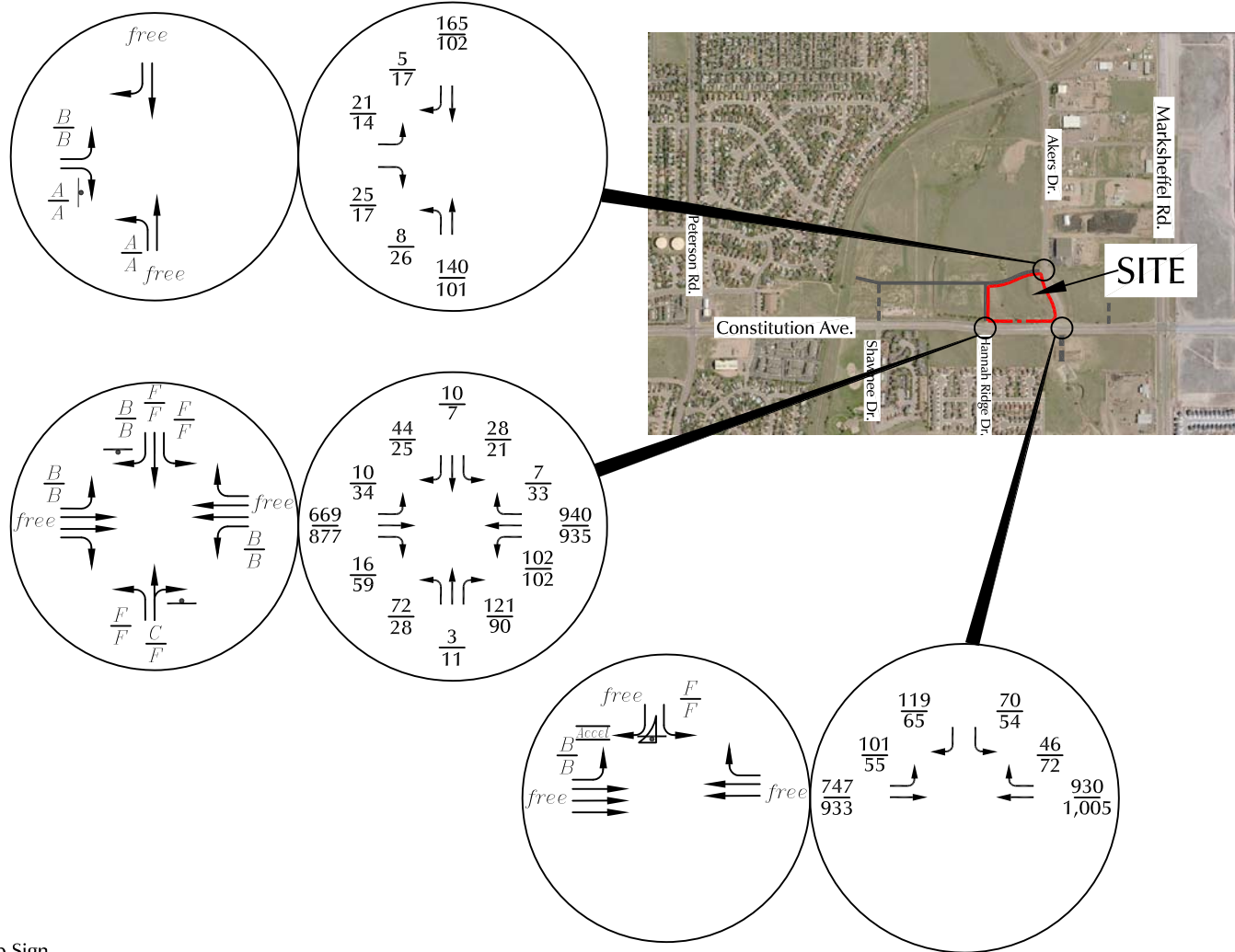
Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)

LEGEND:



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

XXX = Average Weekday Traffic (vehicles per day)



LEGEND:

= Stop Sign

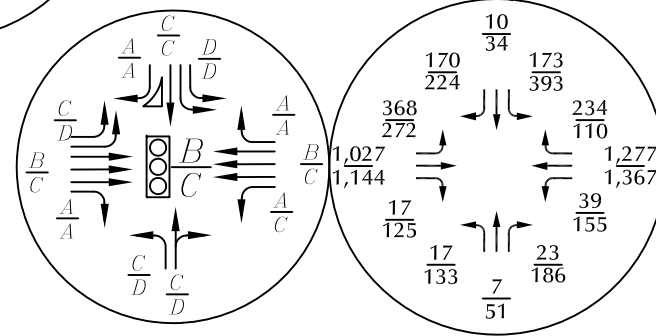
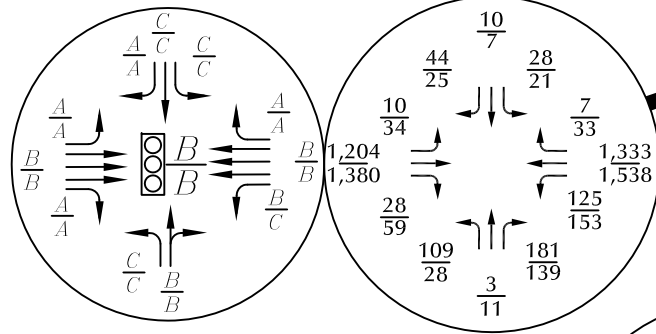
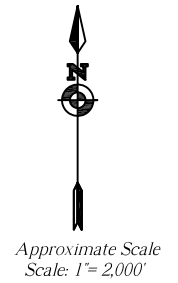
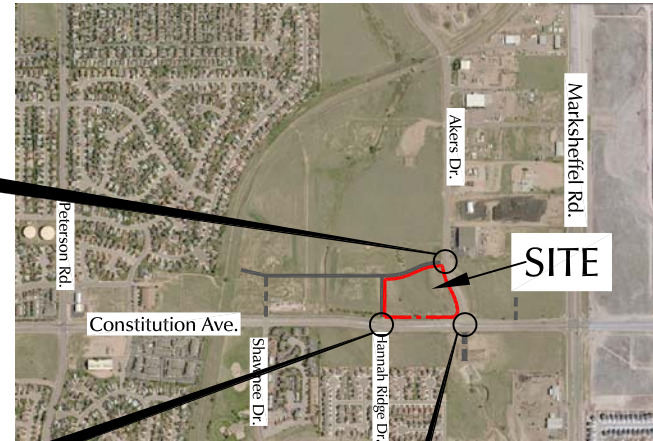
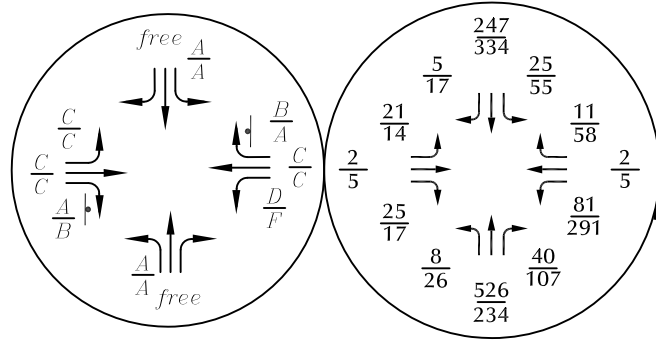
$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service
 $\frac{A}{B}$ = PM Individual Movement Peak-Hour Level of Service



Short-Term Total Traffic, Lane Geometry, Traffic Control and Level of Service

Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)

Figure 8



LEGEND:

⊥ = Stop Sign

⊞ = Traffic Signal

$\frac{XX}{XX}$ = 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

$\frac{C}{D}$ = AM Entire Intersection Peak-Hour Level of Service

$\frac{C}{D}$ = PM Entire Intersection Peak-Hour Level of Service



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

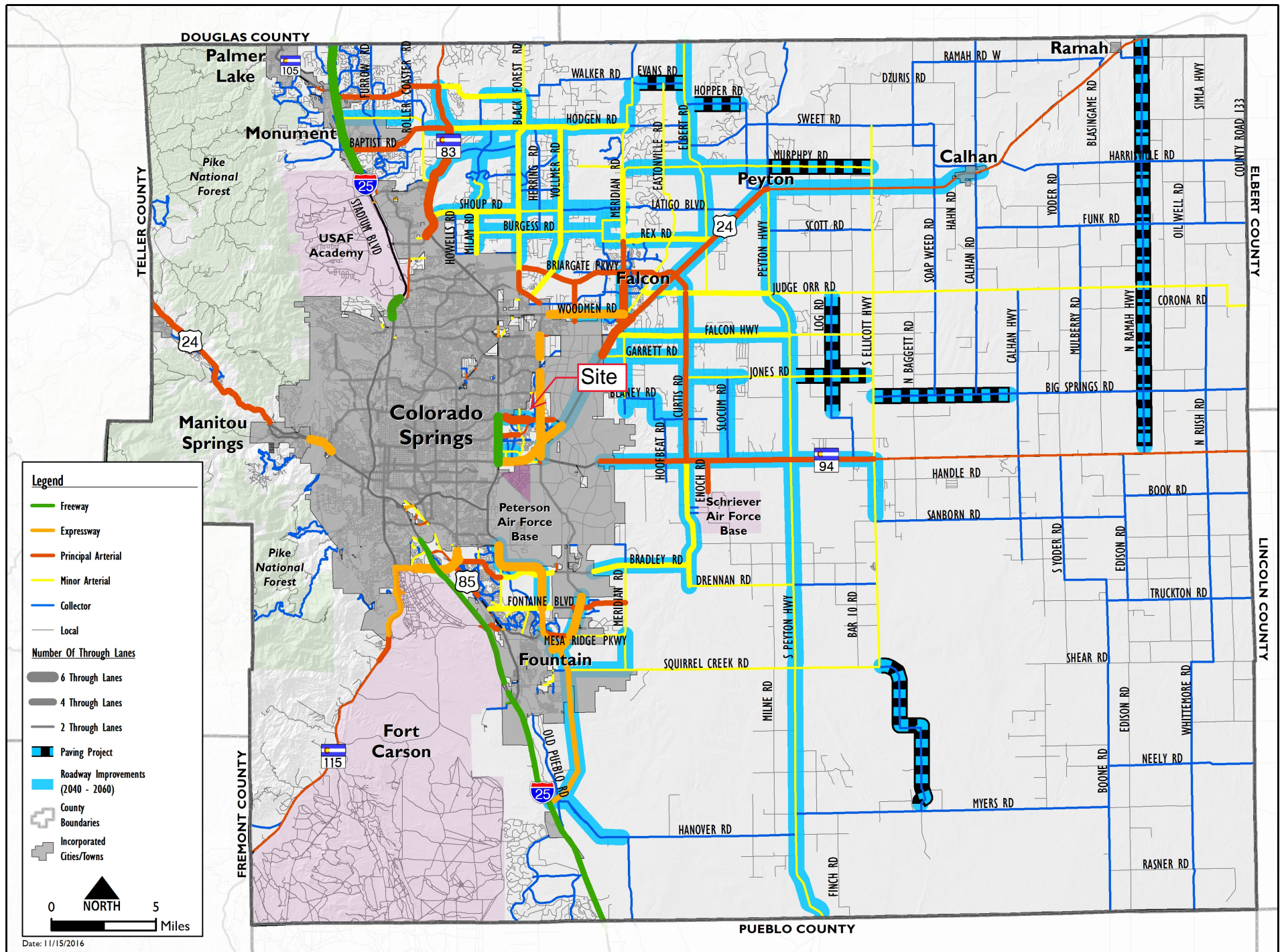
Midtown Collection at Hannah Ridge Filing 3 (LSC #204020)

Figure 9

MTCP Maps



1



Crash History

Traffic Counts

LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210

Colorado Springs, CO 80905

719-633-2868

File Name : Hanna Ridge Dr - Constitution Ave AM.2

Site Code : 194190

Start Date : 2/26/2019

Page No : 1

Groups Printed- Unshifted

	Hanna Ridge Dr Southbound				Constitution Ave Westbound				Hanna Ridge Dr Northbound				Constitution Ave Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30	3	0	5	0	11	122	2	0	10	0	23	0	2	134	0	5	317
06:45	3	0	11	0	13	147	0	0	11	0	32	0	1	132	2	4	356
Total	6	0	16	0	24	269	2	0	21	0	55	0	3	266	2	9	673
07:00	1	0	7	0	15	171	0	0	20	0	22	0	0	170	2	6	414
07:15	4	0	5	0	23	231	0	0	14	0	31	0	2	169	5	9	493
07:30	0	0	7	0	22	204	1	0	17	0	23	0	1	120	1	8	404
07:45	1	0	3	0	35	217	1	0	6	0	26	0	2	160	5	7	463
Total	6	0	22	0	95	823	2	0	57	0	102	0	5	619	13	30	1774
08:00	0	0	3	0	12	150	1	0	9	0	24	0	1	145	5	2	352
08:15	2	0	2	0	10	114	2	0	11	0	15	0	3	87	3	7	256
Grand Total	14	0	43	0	141	1356	7	0	98	0	196	0	12	1117	23	48	3055
Apprch %	24.6	0	75.4	0	9.4	90.2	0.5	0	33.3	0	66.7	0	1	93.1	1.9	4	
Total %	0.5	0	1.4	0	4.6	44.4	0.2	0	3.2	0	6.4	0	0.4	36.6	0.8	1.6	

LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210

Colorado Springs, CO 80905

719-633-2868

File Name : Hanna Ridge Dr - Constitution Ave Mid

Site Code : 00194190

Start Date : 2/28/2019

Page No : 1

Groups Printed- Unshifted

	Hanna Ridge Dr Southbound				Constitution Ave Westbound				Hanna Ridge Dr Northbound				Constitution Ave Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
13:30	2	0	1	0	11	126	1	0	11	1	8	0	3	148	4	4	320
13:45	0	0	0	0	8	105	0	0	4	0	16	0	3	121	5	3	265
Total	2	0	1	0	19	231	1	0	15	1	24	0	6	269	9	7	585
14:00	3	0	3	0	6	107	0	0	7	0	5	0	3	114	3	2	253
14:15	2	0	0	0	10	115	0	1	3	0	15	0	3	128	7	3	287
14:30	0	0	3	0	13	134	0	0	9	0	17	0	1	138	9	4	328
14:45	1	0	3	0	22	133	0	0	11	0	11	0	2	144	8	1	336
Total	6	0	9	0	51	489	0	1	30	0	48	0	9	524	27	10	1204
15:00	0	0	4	0	22	162	2	0	10	0	20	0	2	165	11	2	400
15:15	0	1	3	0	19	185	2	1	11	0	19	0	3	196	16	6	462
Grand Total	8	1	17	0	111	1067	5	2	66	1	111	0	20	1154	63	25	2651
Apprch %	30.8	3.8	65.4	0	9.4	90	0.4	0.2	37.1	0.6	62.4	0	1.6	91.4	5	2	
Total %	0.3	0	0.6	0	4.2	40.2	0.2	0.1	2.5	0	4.2	0	0.8	43.5	2.4	0.9	

LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210

Colorado Springs, CO 80905

719-633-2868

File Name : Hanna Ridge Dr - Constitution Ave Noon

Site Code : 194190

Start Date : 2/27/2019

Page No : 1

Groups Printed- Unshifted

	Hanna Ridge Dr Southbound				Constitution Ave Westbound				Hanna Ridge Dr Northbound				Constitution Ave Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
11:30	2	0	1	0	10	111	1	1	9	0	8	0	1	109	5	2	260
11:45	0	0	0	0	9	117	2	0	7	1	7	0	0	125	8	2	278
Total	2	0	1	0	19	228	3	1	16	1	15	0	1	234	13	4	538
12:00	1	0	1	0	6	125	0	0	7	0	6	0	0	136	7	0	289
12:15	1	0	1	0	4	111	1	0	7	0	13	0	4	125	5	2	274
12:30	0	0	2	0	12	105	0	0	6	1	11	0	3	115	7	4	266
12:45	2	0	1	0	11	107	0	0	6	1	9	0	1	121	11	1	271
Total	4	0	5	0	33	448	1	0	26	2	39	0	8	497	30	7	1100
13:00	1	0	1	0	2	95	2	0	8	1	13	0	2	134	6	6	271
13:15	1	1	3	0	12	101	0	0	6	1	11	0	3	109	5	5	258
Grand Total	8	1	10	0	66	872	6	1	56	5	78	0	14	974	54	22	2167
Apprch %	42.1	5.3	52.6	0	7	92.3	0.6	0.1	40.3	3.6	56.1	0	1.3	91.5	5.1	2.1	
Total %	0.4	0	0.5	0	3	40.2	0.3	0	2.6	0.2	3.6	0	0.6	44.9	2.5	1	

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545 E Pikes Peak Ave, Suite 210

Colorado Springs, CO 80905

719-633-2868

File Name : Hanna Ridge Dr - Constitution Ave PM

Site Code : 00194190

Start Date : 2/28/2019

Page No : 1

Groups Printed- Unshifted

	Hanna Ridge Dr Southbound				Constitution Ave Westbound				Hanna Ridge Dr Northbound				Constitution Ave Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
15:45	2	1	1	0	18	205	4	0	4	0	17	0	1	188	7	6	454
Total	2	1	1	0	18	205	4	0	4	0	17	0	1	188	7	6	454
16:00	1	0	3	0	18	148	0	0	10	1	14	0	2	187	6	6	396
16:15	1	0	3	0	19	184	4	0	9	0	17	0	1	170	10	5	423
16:30	1	0	1	0	20	214	3	1	3	0	20	0	3	187	7	6	466
16:45	1	0	6	0	20	195	3	0	10	0	21	1	3	189	12	7	468
Total	4	0	13	0	77	741	10	1	32	1	72	1	9	733	35	24	1753
17:00	2	0	0	0	17	234	5	0	3	0	22	0	5	186	19	8	501
17:15	3	0	4	0	20	165	4	0	5	0	14	0	6	210	12	6	449
17:30	0	0	1	0	21	187	1	0	8	0	12	0	4	210	7	2	453
Grand Total	11	1	19	0	153	1532	24	1	52	1	137	1	25	1527	80	46	3610
Apprch %	35.5	3.2	61.3	0	8.9	89.6	1.4	0.1	27.2	0.5	71.7	0.5	1.5	91	4.8	2.7	
Total %	0.3	0	0.5	0	4.2	42.4	0.7	0	1.4	0	3.8	0	0.7	42.3	2.2	1.3	

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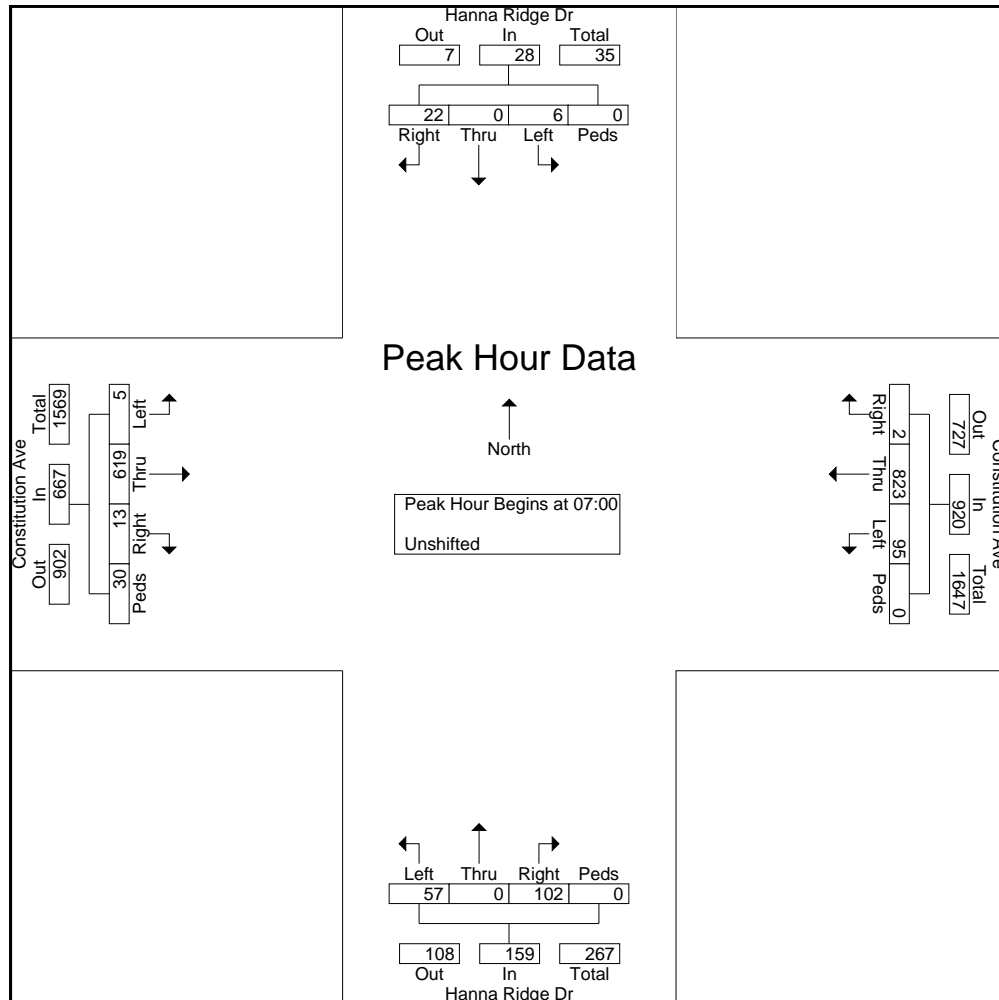
File Name : Hanna Ridge Dr - Constitution Ave AM.2

Site Code : 194190

Start Date : 2/26/2019

Page No : 2

	Hanna Ridge Dr Southbound					Constitution Ave Westbound					Hanna Ridge Dr Northbound					Constitution Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 to 08:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00																					
07:00	1	0	7	0	8	15	171	0	0	186	20	0	22	0	42	0	170	2	6	178	414
07:15	4	0	5	0	9	23	231	0	0	254	14	0	31	0	45	2	169	5	9	185	493
07:30	0	0	7	0	7	22	204	1	0	227	17	0	23	0	40	1	120	1	8	130	404
07:45	1	0	3	0	4	35	217	1	0	253	6	0	26	0	32	2	160	5	7	174	463
Total Volume	6	0	22	0	28	95	823	2	0	920	57	0	102	0	159	5	619	13	30	667	1774
% App. Total	21.4	0	78.6	0		10.3	89.5	0.2	0		35.8	0	64.2	0		0.7	92.8	1.9	4.5		
PHF	.375	.000	.786	.000	.778	.679	.891	.500	.000	.906	.713	.000	.823	.000	.883	.625	.910	.650	.833	.901	.900



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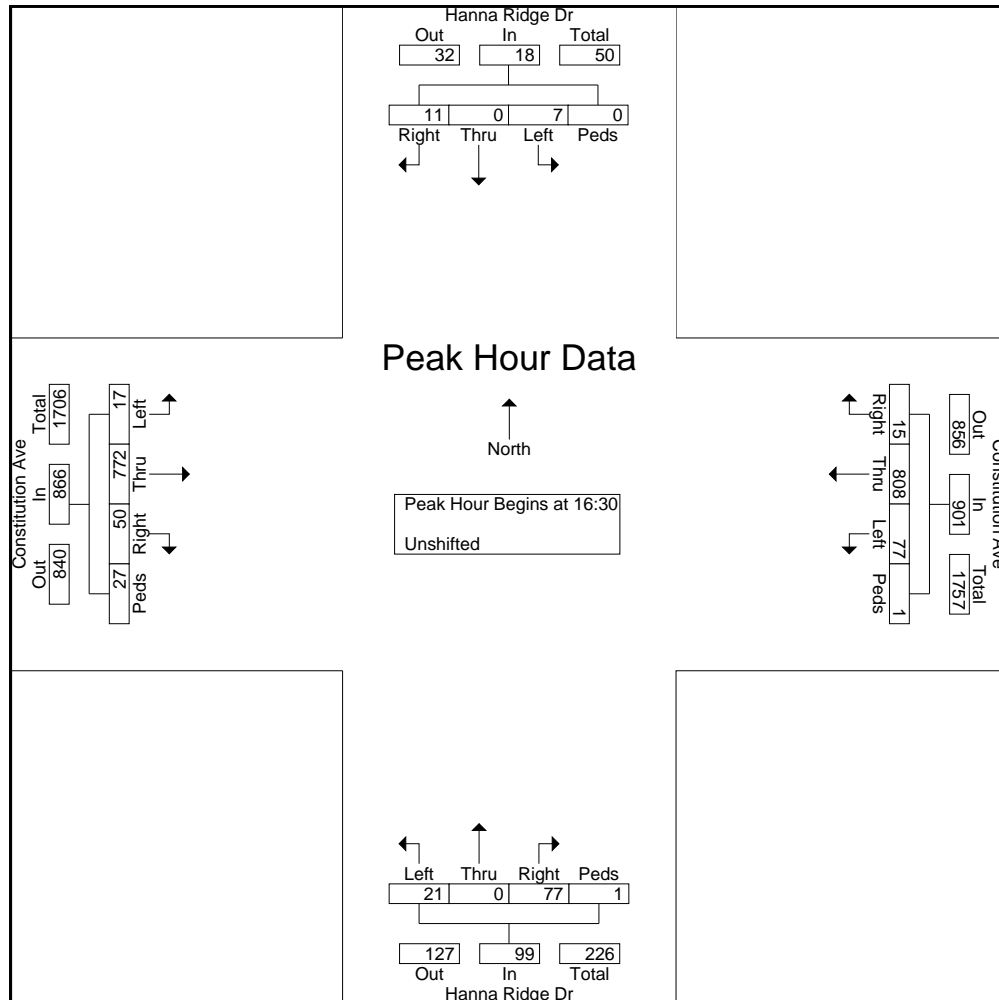
File Name : Hanna Ridge Dr - Constitution Ave PM

Site Code : 00194190

Start Date : 2/28/2019

Page No : 2

	Hanna Ridge Dr Southbound					Constitution Ave Westbound					Hanna Ridge Dr Northbound					Constitution Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 15:45 to 17:30 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:30																					
16:30	1	0	1	0	2	20	214	3	1	238	3	0	20	0	23	3	187	7	6	203	466
16:45	1	0	6	0	7	20	195	3	0	218	10	0	21	1	32	3	189	12	7	211	468
17:00	2	0	0	0	2	17	234	5	0	256	3	0	22	0	25	5	186	19	8	218	501
17:15	3	0	4	0	7	20	165	4	0	189	5	0	14	0	19	6	210	12	6	234	449
Total Volume	7	0	11	0	18	77	808	15	1	901	21	0	77	1	99	17	772	50	27	866	1884
% App. Total	38.9	0	61.1	0		8.5	89.7	1.7	0.1		21.2	0	77.8	1		2	89.1	5.8	3.1		
PHF	.583	.000	.458	.000	.643	.963	.863	.750	.250	.880	.525	.000	.875	.250	.773	.708	.919	.658	.844	.925	.940



LSC Transportation Consultants, Inc.
545 E. Pikes Peak Ave., #210
Colorado Springs, CO 80903
(719) 633-2868

LSC Transportation Consultants, Inc.

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

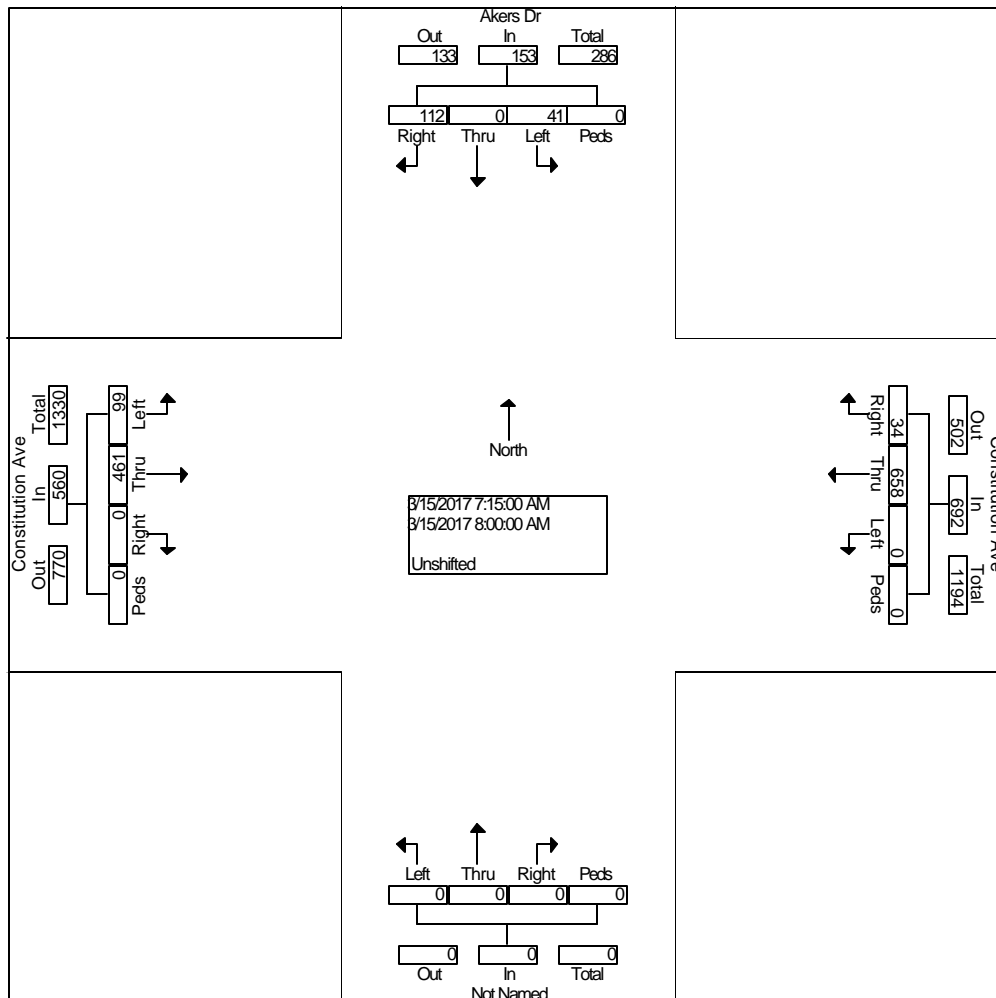
Groups Printed- Unshifted

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Start Time	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	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 80903
(719) 633-2868

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

	Akers Dr From North					Constitution Ave From East					From South					Constitution Ave From West					
Start Time	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	Int. 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																					0.910
High Int.	07:30 AM					07:30 AM					6:15:00 AM					07:15 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					



LSC Transportation Consultants, Inc.
545 E. Pikes Peak Ave., #210
Colorado Springs, CO 80908
(719) 633-2868

LSC Transportation Consultants, Inc.

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

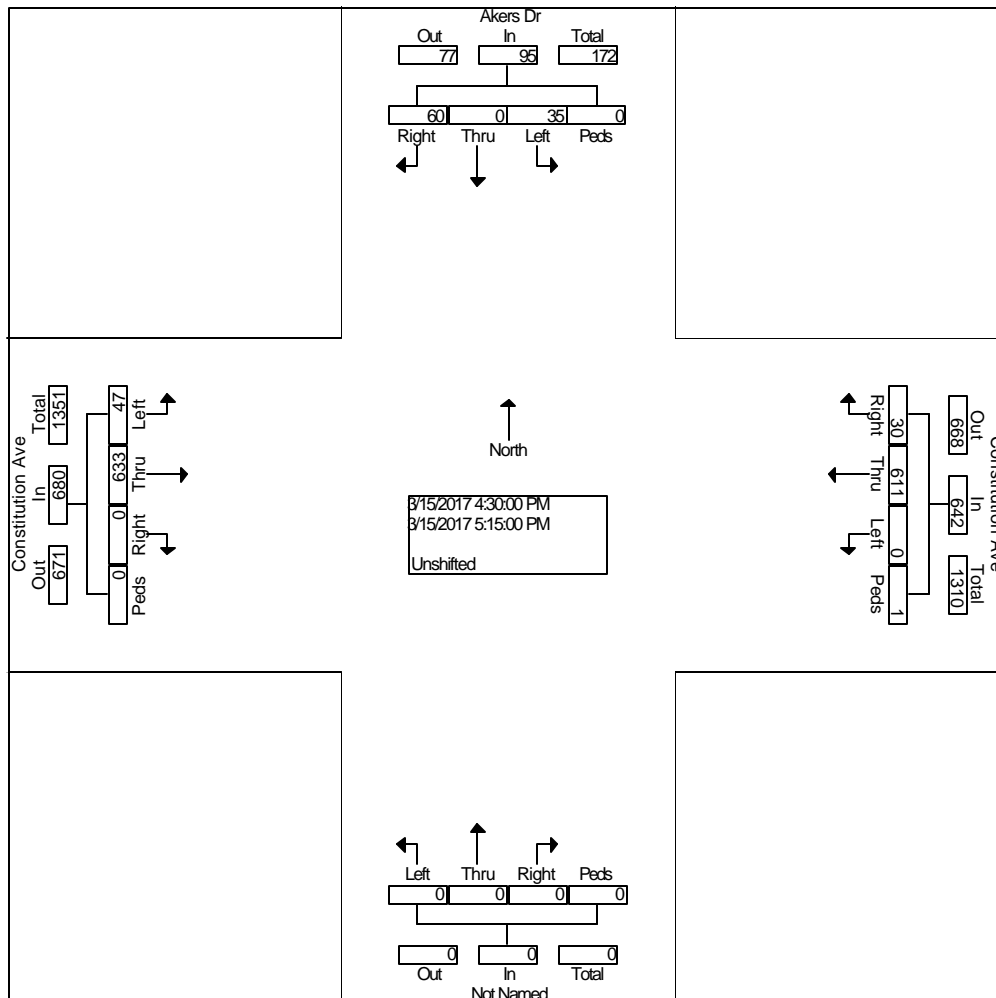
Groups Printed- Unshifted

	Akers Dr From North				Constitution Ave From East				From South				Constitution Ave From West				Int. Total
Start Time	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 80908
(719) 633-2868

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













	Akers Dr From North					Constitution Ave From East					From South					Constitution Ave From West					
Start Time	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	Int. 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																					0.920
High Int.	05:00 PM					04:30 PM					3:45:00 PM					05:15 PM					
Volume	35	0	18	0	53	7	16	0	0	168	0	0	0	0	0	0	17	12	0	187	
Peak Factor	0.448					0.955										0.909					



Levels of Service

HCM 6th TWSC
2: Hannah Ridge Dr & Constitution Ave

Existing Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	619	13	95	833	2	57	0	102	6	1	22
Future Vol, veh/h	5	619	13	95	833	2	57	0	102	6	1	22
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	90	90	90	91	91	91	88	88	88	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	688	14	104	915	2	65	0	116	8	1	28







Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	917	0	0	702	0	0	1366	1825	344	1479	1837	458
Stage 1	-	-	-	-	-	-	700	700	-	1123	1123	-
Stage 2	-	-	-	-	-	-	666	1125	-	356	714	-
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	740	-	-	891	-	-	106	76	652	87	75	550
Stage 1	-	-	-	-	-	-	396	440	-	219	279	-
Stage 2	-	-	-	-	-	-	415	278	-	634	433	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	740	-	-	891	-	-	90	67	652	65	66	550
Mov Cap-2 Maneuver	-	-	-	-	-	-	90	67	-	65	66	-
Stage 1	-	-	-	-	-	-	393	436	-	217	246	-
Stage 2	-	-	-	-	-	-	346	245	-	517	430	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	47.7	25.1
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	90	652	740	-	-	891	-	-	65	66	550
HCM Lane V/C Ratio	0.72	0.178	0.008	-	-	0.117	-	-	0.118	0.019	0.051
HCM Control Delay (s)	112.1	11.7	9.9	-	-	9.6	-	-	67.7	60.6	11.9
HCM Lane LOS	F	B	A	-	-	A	-	-	F	F	B
HCM 95th %tile Q(veh)	3.6	0.6	0	-	-	0.4	-	-	0.4	0.1	0.2













HCM 6th TWSC
5: Constitution Ave & Akers Dr

Existing Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	99	628	808	34	41	112
Future Vol, veh/h	99	628	808	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	90	90	91	91	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	698	888	37	47	129
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	925	0	-	0	1387	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	499	-
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	734	-	-	-	162	0
Stage 1	-	-	-	-	353	0
Stage 2	-	-	-	-	542	0
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	734	-	-	-	138	-
Mov Cap-2 Maneuver	-	-	-	-	138	-
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	542	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.5	0		44		
HCM LOS	E					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	734	-	-	-	138	-
HCM Lane V/C Ratio	0.15	-	-	-	0.341	-
HCM Control Delay (s)	10.8	-	-	-	44	0
HCM Lane LOS	B	-	-	-	E	A
HCM 95th %tile Q(veh)	0.5	-	-	-	1.4	-

HCM 6th TWSC
2: Hannah Ridge Dr & Constitution Ave

Existing Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	772	50	77	808	15	21	0	77	7	1	11
Future Vol, veh/h	17	772	50	77	808	15	21	0	77	7	1	11
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	92	92	88	88	88	83	83	83	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	839	54	88	918	17	25	0	93	9	1	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	935	0	0	893	0	0	1511	1986	420	1550	2023	459
Stage 1	-	-	-	-	-	-	875	875	-	1094	1094	-
Stage 2	-	-	-	-	-	-	636	1111	-	456	929	-
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	728	-	-	755	-	-	83	60	582	77	57	549
Stage 1	-	-	-	-	-	-	310	365	-	228	288	-
Stage 2	-	-	-	-	-	-	433	283	-	554	344	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	728	-	-	755	-	-	71	52	582	58	49	549
Mov Cap-2 Maneuver	-	-	-	-	-	-	71	52	-	58	49	-
Stage 1	-	-	-	-	-	-	302	356	-	222	254	-
Stage 2	-	-	-	-	-	-	371	250	-	454	335	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.9			27.2			39.8		
HCM LOS							D			E		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	71	582	728	-	-	755	-	-	58	49	549
HCM Lane V/C Ratio	0.356	0.159	0.025	-	-	0.116	-	-	0.155	0.026	0.026
HCM Control Delay (s)	81.5	12.4	10.1	-	-	10.4	-	-	78.1	80.4	11.7
HCM Lane LOS	F	B	B	-	-	B	-	-	F	F	B
HCM 95th %tile Q(veh)	1.3	0.6	0.1	-	-	0.4	-	-	0.5	0.1	0.1

HCM 6th TWSC
5: Constitution Ave & Akers Dr

Existing Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑	↰	↰	↰
Traffic Vol, veh/h	47	809	840	30	35	60
Future Vol, veh/h	47	809	840	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	92	92	88	88	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	879	955	34	42	72













Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	989	0	0 1409
Stage 1	-	-	- 955
Stage 2	-	-	- 454
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	695	-	- 158 0
Stage 1	-	-	- 326 0
Stage 2	-	-	- 572 0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	695	-	- 146
Mov Cap-2 Maneuver	-	-	- 146
Stage 1	-	-	- 302
Stage 2	-	-	- 572

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	39.4
HCM LOS	E		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	695	-	-	-	146	-
HCM Lane V/C Ratio	0.074	-	-	-	0.289	-
HCM Control Delay (s)	10.6	-	-	-	39.4	0
HCM Lane LOS	B	-	-	-	E	A
HCM 95th %tile Q(veh)	0.2	-	-	-	1.1	-

HCM 6th TWSC
2: Hannah Ridge Dr & Constitution Ave

Short-Term Background Traffic
AM Peak Hour







Intersection												
Int Delay, s/veh	22.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	699	16	102	940	6	72	3	121	28	9	33
Future Vol, veh/h	6	699	16	102	940	6	72	3	121	28	9	33
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	90	90	90	91	91	91	88	88	88	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	777	18	112	1033	7	82	3	138	36	12	42







Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1040	0	0	795	0	0	1538	2055	389	1661	2066	517
Stage 1	-	-	-	-	-	-	791	791	-	1257	1257	-
Stage 2	-	-	-	-	-	-	747	1264	-	404	809	-
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	664	-	-	822	-	-	~ 79	55	610	64	54	503
Stage 1	-	-	-	-	-	-	349	399	-	181	241	-
Stage 2	-	-	-	-	-	-	371	239	-	594	392	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	664	-	-	822	-	-	~ 52	47	610	42	46	503
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 52	47	-	42	46	-
Stage 1	-	-	-	-	-	-	345	395	-	179	208	-
Stage 2	-	-	-	-	-	-	277	206	-	451	388	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	178.8	116.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	52	473	664	-	-	822	-	-	42	46	503
HCM Lane V/C Ratio	1.573	0.298	0.01	-	-	0.136	-	-	0.855	0.251	0.084
HCM Control Delay (s)	\$ 459.5	15.8	10.5	-	-	10.1	-	-	242.5	107.7	12.8
HCM Lane LOS	F	C	B	-	-	B	-	-	F	F	B
HCM 95th %tile Q(veh)	7.7	1.2	0	-	-	0.5	-	-	3.3	0.8	0.3













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

Intersection						
Int Delay, s/veh	4.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	101	747	929	45	64	119
Future Vol, veh/h	101	747	929	45	64	119
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	195	-	-	0	350	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	91	91	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	112	830	1021	49	74	137
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	1070	0	-	0	1577	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	556	-
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	647	-	-	-	125	0
Stage 1	-	-	-	-	301	0
Stage 2	-	-	-	-	506	0
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	647	-	-	-	103	-
Mov Cap-2 Maneuver	-	-	-	-	103	-
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	506	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.4	0		99.6		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	647	-	-	-	103	-
HCM Lane V/C Ratio	0.173	-	-	-	0.714	-
HCM Control Delay (s)	11.7	-	-	-	99.6	0
HCM Lane LOS	B	-	-	-	F	A
HCM 95th %tile Q(veh)	0.6	-	-	-	3.7	-

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	19	6	140	165	4
Future Vol, veh/h	15	19	6	140	165	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	130	-	-	115
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	21	7	152	179	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	345	179	183	0	-	0
Stage 1	179	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	652	864	1392	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	649	864	1392	-	-	-
Mov Cap-2 Maneuver	649	-	-	-	-	-
Stage 1	848	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.9	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1392	-	649	864	-	-
HCM Lane V/C Ratio	0.005	-	0.025	0.024	-	-
HCM Control Delay (s)	7.6	-	10.7	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

HCM 6th TWSC
2: Hannah Ridge Dr & Constitution Ave

Short-Term Total Traffic
PM Peak Hour







Intersection												
Int Delay, s/veh	13.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	877	59	102	935	30	28	10	90	21	6	18
Future Vol, veh/h	22	877	59	102	935	30	28	10	90	21	6	18
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	92	92	88	88	88	83	83	83	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	953	64	116	1063	34	34	12	108	27	8	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1097	0	0	1017	0	0	1769	2330	477	1826	2360	532
Stage 1	-	-	-	-	-	-	1001	1001	-	1295	1295	-
Stage 2	-	-	-	-	-	-	768	1329	-	531	1065	-
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	632	-	-	678	-	-	53	37	534	48	35	492
Stage 1	-	-	-	-	-	-	260	319	-	172	231	-
Stage 2	-	-	-	-	-	-	360	222	-	500	297	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	632	-	-	678	-	-	34	29	534	~ 22	28	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	34	29	-	~ 22	28	-
Stage 1	-	-	-	-	-	-	250	307	-	165	191	-
Stage 2	-	-	-	-	-	-	273	184	-	368	286	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			1.1			110			272.9		
HCM LOS							F			F		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	34	195	632	-	-	678	-	-	22	28	492
HCM Lane V/C Ratio	0.992	0.618	0.038	-	-	0.171	-	-	1.224	0.275	0.047
HCM Control Delay (s)	\$ 326.6	49.4	10.9	-	-	11.4	-	-	\$ 523.4	176.6	12.7
HCM Lane LOS	F	E	B	-	-	B	-	-	F	F	B
HCM 95th %tile Q(veh)	3.5	3.5	0.1	-	-	0.6	-	-	3.5	0.9	0.1

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

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	933	1002	66	50	65
Future Vol, veh/h	55	933	1002	66	50	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	195	-	-	0	350	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	88	88	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	1014	1139	75	60	78







Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1214	0	0 1665
Stage 1	-	-	- 1139
Stage 2	-	-	- 526
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	570	-	- 111 0
Stage 1	-	-	- 261 0
Stage 2	-	-	- 524 0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	570	-	- 99
Mov Cap-2 Maneuver	-	-	- 99
Stage 1	-	-	- 234
Stage 2	-	-	- 524

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	86.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	570	-	-	-	99	-
HCM Lane V/C Ratio	0.105	-	-	-	0.608	-
HCM Control Delay (s)	12.1	-	-	-	86.4	0
HCM Lane LOS	B	-	-	-	F	A
HCM 95th %tile Q(veh)	0.4	-	-	-	2.9	-

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	13	20	101	102	13
Future Vol, veh/h	10	13	20	101	102	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	130	-	-	115
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	14	22	110	111	14













Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	265	111	125
Stage 1	111	-	-
Stage 2	154	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	724	942	1462
Stage 1	914	-	-
Stage 2	874	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	713	942	1462
Mov Cap-2 Maneuver	713	-	-
Stage 1	900	-	-
Stage 2	874	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1462	-	713	942	-	-
HCM Lane V/C Ratio	0.015	-	0.015	0.015	-	-
HCM Control Delay (s)	7.5	-	10.1	8.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

HCM 6th TWSC
2: Hannah Ridge Dr & Constitution Ave

Short-Term Total Traffic
AM Peak Hour







Intersection												
Int Delay, s/veh	25.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	699	16	102	940	7	72	3	121	28	10	44
Future Vol, veh/h	10	699	16	102	940	7	72	3	121	28	10	44
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	90	90	90	91	91	91	88	88	88	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	777	18	112	1033	8	82	3	138	36	13	56







Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1041	0	0	795	0	0	1546	2064	389	1669	2074	517
Stage 1	-	-	-	-	-	-	799	799	-	1257	1257	-
Stage 2	-	-	-	-	-	-	747	1265	-	412	817	-
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	664	-	-	822	-	-	~ 78	54	610	63	53	503
Stage 1	-	-	-	-	-	-	345	396	-	181	241	-
Stage 2	-	-	-	-	-	-	371	239	-	588	388	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	664	-	-	822	-	-	~ 48	46	610	41	45	503
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 48	46	-	41	45	-
Stage 1	-	-	-	-	-	-	339	389	-	178	208	-
Stage 2	-	-	-	-	-	-	267	206	-	444	381	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	203.3	107.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	48	470	664	-	-	822	-	-	41	45	503
HCM Lane V/C Ratio	1.705	0.3	0.017	-	-	0.136	-	-	0.876	0.285	0.112
HCM Control Delay (s)	\$ 526	15.9	10.5	-	-	10.1	-	-	252.9	114.2	13.1
HCM Lane LOS	F	C	B	-	-	B	-	-	F	F	B
HCM 95th %tile Q(veh)	8	1.2	0.1	-	-	0.5	-	-	3.4	1	0.4













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







Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	101	747	930	46	70	119
Future Vol, veh/h	101	747	930	46	70	119
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	195	-	-	0	350	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	91	91	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	112	830	1022	51	80	137
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1073	0	-	0	1578	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	556	-
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	645	-	-	-	125	0
Stage 1	-	-	-	-	301	0
Stage 2	-	-	-	-	506	0
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	645	-	-	-	103	-
Mov Cap-2 Maneuver	-	-	-	-	103	-
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	506	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.4	0		112		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	645	-	-	-	103	-
HCM Lane V/C Ratio	0.174	-	-	-	0.781	-
HCM Control Delay (s)	11.8	-	-	-	112	0
HCM Lane LOS	B	-	-	-	F	A
HCM 95th %tile Q(veh)	0.6	-	-	-	4.3	-







Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	25	8	140	165	5
Future Vol, veh/h	21	25	8	140	165	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	130	-	-	115
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	27	9	152	179	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	349	179	184	0	-	0
Stage 1	179	-	-	-	-	-
Stage 2	170	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	648	864	1391	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	644	864	1391	-	-	-
Mov Cap-2 Maneuver	644	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10	0.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1391	-	644	864	-	-
HCM Lane V/C Ratio	0.006	-	0.035	0.031	-	-
HCM Control Delay (s)	7.6	-	10.8	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

HCM 6th TWSC
2: Hannah Ridge Dr & Constitution Ave

Short-Term Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	17.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	877	59	102	935	33	28	11	90	21	7	25
Future Vol, veh/h	34	877	59	102	935	33	28	11	90	21	7	25
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	92	92	88	88	88	83	83	83	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	953	64	116	1063	38	34	13	108	27	9	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1101	0	0	1017	0	0	1795	2360	477	1852	2386	532
Stage 1	-	-	-	-	-	-	1027	1027	-	1295	1295	-
Stage 2	-	-	-	-	-	-	768	1333	-	557	1091	-
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	630	-	-	678	-	-	51	35	534	46	34	492
Stage 1	-	-	-	-	-	-	251	310	-	172	231	-
Stage 2	-	-	-	-	-	-	360	221	-	482	289	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	630	-	-	678	-	-	~ 30	27	534	~ 19	27	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 30	27	-	~ 19	27	-
Stage 1	-	-	-	-	-	-	236	292	-	162	191	-
Stage 2	-	-	-	-	-	-	266	183	-	345	272	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			1.1			136.1			288.6		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3	
Capacity (veh/h)	30	175	630	-	-	678	-	-	19	27	492	
HCM Lane V/C Ratio	1.124	0.695	0.059	-	-	0.171	-	-	1.417	0.332	0.065	
HCM Control Delay (s)	\$ 401	62.6	11.1	-	-	11.4	-	-	\$ 648.3	194.3	12.8	
HCM Lane LOS	F	F	B	-	-	B	-	-	F	F	B	
HCM 95th %tile Q(veh)	3.8	4.2	0.2	-	-	0.6	-	-	3.7	1	0.2	
Notes												
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon												





























Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	933	1005	72	54	65
Future Vol, veh/h	55	933	1005	72	54	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	195	-	-	0	350	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	88	88	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	1014	1142	82	65	78
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1224	0	-	0	1668	-
Stage 1	-	-	-	-	1142	-
Stage 2	-	-	-	-	526	-
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	565	-	-	-	111	0
Stage 1	-	-	-	-	260	0
Stage 2	-	-	-	-	524	0
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	565	-	-	-	99	-
Mov Cap-2 Maneuver	-	-	-	-	99	-
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	524	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.7	0		93.5		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	565	-	-	-	99	-
HCM Lane V/C Ratio	0.106	-	-	-	0.657	-
HCM Control Delay (s)	12.1	-	-	-	93.5	0
HCM Lane LOS	B	-	-	-	F	A
HCM 95th %tile Q(veh)	0.4	-	-	-	3.3	-

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	17	26	101	102	17
Future Vol, veh/h	14	17	26	101	102	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	130	-	-	115
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	18	28	110	111	18
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	277	111	129	0	-	0
Stage 1	111	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	713	942	1457	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	699	942	1457	-	-	-
Mov Cap-2 Maneuver	699	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.5	1.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1457	-	699	942	-	-
HCM Lane V/C Ratio	0.019	-	0.022	0.02	-	-
HCM Control Delay (s)	7.5	-	10.3	8.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.1	-	-

Timings

2: Hannah Ridge & Constitution

2040 Background Traffic
AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations		  			  			 		 	
Traffic Volume (vph)	6	1204	28	125	1333	6	109	3	28	9	33
Future Volume (vph)	6	1204	28	125	1333	6	109	3	28	9	33
Turn Type	pm+pt	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		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	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	75.0	75.0	10.0	75.0	75.0	10.0	25.0	10.0	25.0	25.0
Total Split (%)	8.3%	62.5%	62.5%	8.3%	62.5%	62.5%	8.3%	20.8%	8.3%	20.8%	20.8%
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 Effect Green (s)	30.2	24.3	24.3	33.3	30.5	30.5	11.0	9.4	9.9	7.5	7.5
Actuated g/C Ratio	0.53	0.42	0.42	0.58	0.53	0.53	0.19	0.16	0.17	0.13	0.13
v/c Ratio	0.02	0.59	0.04	0.44	0.52	0.01	0.42	0.48	0.11	0.04	0.11
Control Delay	6.7	15.4	0.1	11.4	11.0	0.0	25.9	11.5	20.5	27.7	0.7
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	6.7	15.4	0.1	11.4	11.0	0.0	25.9	11.5	20.5	27.7	0.7
LOS	A	B	A	B	B	A	C	B	C	C	A
Approach Delay		15.1			11.0			16.9		11.9	
Approach LOS		B			B			B		B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 57.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 13.2









Intersection LOS: B

Intersection Capacity Utilization 63.2%

ICU Level of Service B























Analysis Period (min) 15

Splits and Phases: 2: Hannah Ridge & Constitution

			
10 s	25 s	10 s	75 s
			
10 s	25 s	10 s	75 s

Timings
5: Akers & Constitution

2040 Background Traffic
AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	368	1027	17	39	1276	232	17	7	167	10	170
Future Volume (vph)	368	1027	17	39	1276	232	17	7	167	10	170
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Free
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4	8		8	2				Free
Detector Phase	7	4	4	3	8	8	5	2	1	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	
Minimum Split (s)	9.0	23.0	23.0	9.0	23.0	23.0	9.0	15.0	9.0	20.0	
Total Split (s)	20.0	75.0	75.0	10.0	65.0	65.0	10.0	25.0	10.0	25.0	
Total Split (%)	16.7%	62.5%	62.5%	8.3%	54.2%	54.2%	8.3%	20.8%	8.3%	20.8%	
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	
Act Effect Green (s)	14.0	41.9	41.9	35.4	28.1	28.1	7.6	6.4	5.6	8.1	69.4
Actuated g/C Ratio	0.20	0.60	0.60	0.51	0.40	0.40	0.11	0.09	0.08	0.12	1.00
v/c Ratio	0.56	0.35	0.02	0.12	0.65	0.31	0.09	0.18	0.63	0.05	0.11
Control Delay	30.9	8.7	0.1	6.3	18.7	3.4	29.2	20.9	47.5	32.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	8.7	0.1	6.3	18.7	3.4	29.2	20.9	47.5	32.8	0.1
LOS	C	A	A	A	B	A	C	C	D	C	A
Approach Delay		14.4			16.1			23.9		23.9	
Approach LOS		B			B			C		C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 69.4

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 16.3

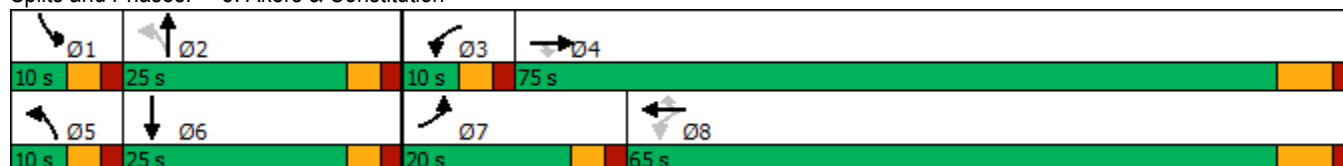
Intersection LOS: B













Intersection Capacity Utilization 60.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: Akers & Constitution



Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	2	19	81	2	11	6	526	40	25	247	4
Future Vol, veh/h	15	2	19	81	2	11	6	526	40	25	247	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	100	0	-	0	170	-	0	200	-	155
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	16	2	20	85	2	12	6	554	42	26	260	4





























Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	906	920	260	891	882	554	264	0
Stage 1	312	312	-	566	566	-	-	-
Stage 2	594	608	-	325	316	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	257	271	779	263	285	532	1300	-
Stage 1	699	658	-	509	507	-	-	-
Stage 2	491	486	-	687	655	-	-	-
Platoon blocked, %								-
Mov Cap-1 Maneuver	244	262	779	249	276	532	1300	-
Mov Cap-2 Maneuver	244	262	-	249	276	-	-	-
Stage 1	696	640	-	506	504	-	-	-
Stage 2	476	484	-	649	637	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	24.9	0.1	0.8
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1300	-	-	244	262	779	249	276	532	980	-	-
HCM Lane V/C Ratio	0.005	-	-	0.065	0.008	0.026	0.342	0.008	0.022	0.027	-	-
HCM Control Delay (s)	7.8	-	-	20.8	18.9	9.7	26.8	18.1	11.9	8.8	-	-
HCM Lane LOS	A	-	-	C	C	A	D	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0.1	1.5	0	0.1	0.1	-	-

Timings 2: Hannah Ridge & 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)	22	1380	59	153	1538	30	28	10	21	6	18
Future Volume (vph)	22	1380	59	153	1538	30	28	10	21	6	18
Turn Type	pm+pt	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		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	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	75.0	75.0	10.0	75.0	75.0	10.0	25.0	10.0	25.0	25.0
Total Split (%)	8.3%	62.5%	62.5%	8.3%	62.5%	62.5%	8.3%	20.8%	8.3%	20.8%	20.8%
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 Effect Green (s)	36.1	28.7	28.7	39.8	36.1	36.1	8.8	7.2	8.8	7.2	7.2
Actuated g/C Ratio	0.58	0.46	0.46	0.64	0.58	0.58	0.14	0.12	0.14	0.12	0.12
v/c Ratio	0.09	0.62	0.08	0.60	0.55	0.03	0.13	0.50	0.10	0.03	0.06
Control Delay	5.9	14.3	0.8	20.8	11.0	0.1	24.9	13.8	24.7	30.8	0.4
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	5.9	14.3	0.8	20.8	11.0	0.1	24.9	13.8	24.7	30.8	0.4
LOS	A	B	A	C	B	A	C	B	C	C	A
Approach Delay		13.6			11.7			15.5		15.7	
Approach LOS		B			B			B		B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 62.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 12.8









Intersection LOS: B

Intersection Capacity Utilization 65.9%

ICU Level of Service C






























Analysis Period (min) 15

Splits and Phases: 2: Hannah Ridge & Constitution

 Ø1	 Ø2	 Ø3	 Ø4
10 s	25 s	10 s	75 s
 Ø5	 Ø6	 Ø7	 Ø8
10 s	25 s	10 s	75 s

Timings
5: Akers & Constitution

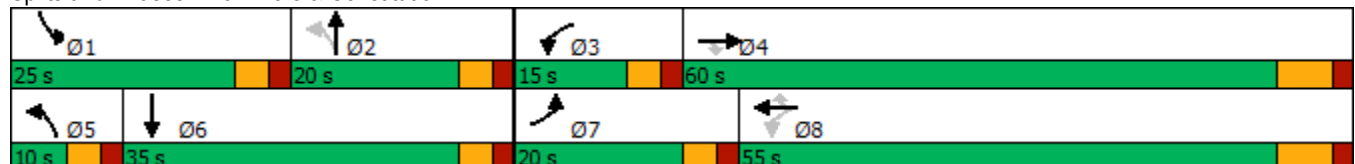
2040 Background Traffic
PM Peak Hour













											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	 	  			  			 	 		
Traffic Volume (vph)	272	1144	125	155	1364	105	133	51	390	34	224
Future Volume (vph)	272	1144	125	155	1364	105	133	51	390	34	224
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Free
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4	8		8	2				Free
Detector Phase	7	4	4	3	8	8	5	2	1	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	
Minimum Split (s)	9.0	23.0	23.0	9.0	23.0	23.0	9.0	15.0	9.0	20.0	
Total Split (s)	20.0	60.0	60.0	15.0	55.0	55.0	10.0	20.0	25.0	35.0	
Total Split (%)	16.7%	50.0%	50.0%	12.5%	45.8%	45.8%	8.3%	16.7%	20.8%	29.2%	
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	
Act Effect Green (s)	13.2	41.7	41.7	49.0	37.7	37.7	24.2	12.6	17.0	18.7	103.1
Actuated g/C Ratio	0.13	0.40	0.40	0.48	0.37	0.37	0.23	0.12	0.16	0.18	1.00
v/c Ratio	0.65	0.59	0.18	0.59	0.77	0.16	0.36	0.81	0.73	0.11	0.15
Control Delay	52.8	25.3	2.7	21.7	32.4	1.8	36.1	44.6	50.9	34.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.8	25.3	2.7	21.7	32.4	1.8	36.1	44.6	50.9	34.8	0.2
LOS	D	C	A	C	C	A	D	D	D	C	A
Approach Delay		28.3			29.4			41.5		32.5	
Approach LOS		C			C			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 103.1
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 30.6
 Intersection LOS: C
 Intersection Capacity Utilization 77.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 5: Akers & Constitution



Intersection												
Int Delay, s/veh	30.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	5	13	291	5	58	20	234	107	55	344	13
Future Vol, veh/h	10	5	13	291	5	58	20	234	107	55	344	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	100	0	-	0	170	-	0	200	-	155
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	5	14	306	5	61	21	246	113	58	362	14

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	856	879	362	783	780	246	376	0	0	359	0	0
Stage 1	478	478	-	288	288	-	-	-	-	-	-	-
Stage 2	378	401	-	495	492	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	278	286	683	311	327	793	1182	-	-	1200	-	-
Stage 1	568	556	-	720	674	-	-	-	-	-	-	-
Stage 2	644	601	-	556	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	241	267	683	~ 285	306	793	1182	-	-	1200	-	-
Mov Cap-2 Maneuver	241	267	-	~ 285	306	-	-	-	-	-	-	-
Stage 1	558	529	-	707	662	-	-	-	-	-	-	-
Stage 2	579	590	-	513	522	-	-	-	-	-	-	-





























Approach	EB	WB	NB	SB
HCM Control Delay, s	15.5	95.9	0.4	1.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1182	-	-	241	267	683	285	306	793	1200	-	-
HCM Lane V/C Ratio	0.018	-	-	0.044	0.02	0.02	1.075	0.017	0.077	0.048	-	-
HCM Control Delay (s)	8.1	-	-	20.6	18.8	10.4	114.4	17	9.9	8.2	-	-
HCM Lane LOS	A	-	-	C	C	B	F	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.1	0.1	12.1	0.1	0.2	0.2	-	-

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

Timings 2: Hannah Ridge & 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)	10	1204	28	125	1333	7	109	3	28	10	44
Future Volume (vph)	10	1204	28	125	1333	7	109	3	28	10	44
Turn Type	pm+pt	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		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	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	75.0	75.0	10.0	75.0	75.0	10.0	25.0	10.0	25.0	25.0
Total Split (%)	8.3%	62.5%	62.5%	8.3%	62.5%	62.5%	8.3%	20.8%	8.3%	20.8%	20.8%
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 Effect Green (s)	30.9	24.9	24.9	33.9	31.0	31.0	11.1	9.5	10.0	7.5	7.5
Actuated g/C Ratio	0.53	0.43	0.43	0.58	0.53	0.53	0.19	0.16	0.17	0.13	0.13
v/c Ratio	0.04	0.58	0.04	0.44	0.52	0.01	0.43	0.48	0.11	0.05	0.15
Control Delay	6.8	15.3	0.1	11.4	11.0	0.0	26.2	11.6	20.5	27.7	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	15.3	0.1	11.4	11.0	0.0	26.2	11.6	20.5	27.7	1.0
LOS	A	B	A	B	B	A	C	B	C	C	A
Approach Delay		14.9			10.9			17.0		11.0	
Approach LOS		B			B			B		B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 58.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 13.1

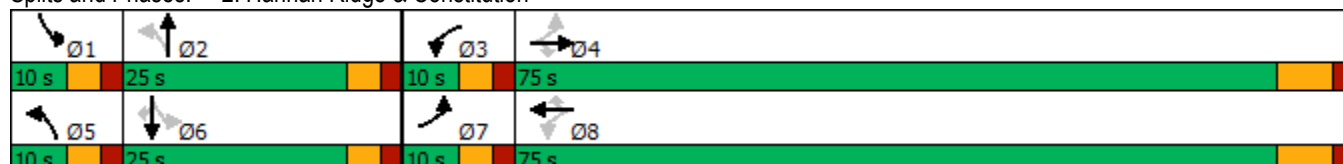
Intersection LOS: B

Intersection Capacity Utilization 63.2%

ICU Level of Service B































Analysis Period (min) 15

Splits and Phases: 2: Hannah Ridge & Constitution



Timings
5: Akers & Constitution

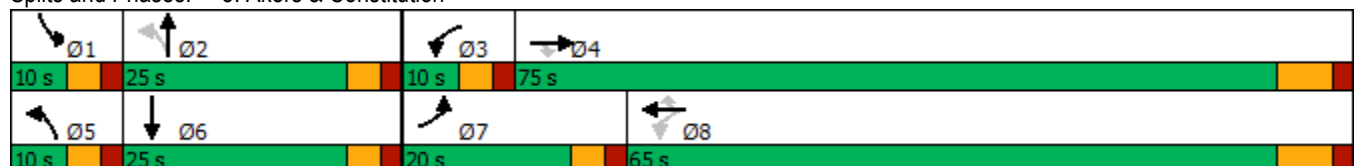
2040 Total Traffic
AM Peak Hour













											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	 	  			  			 	  		
Traffic Volume (vph)	368	1027	17	39	1277	234	17	7	173	10	170
Future Volume (vph)	368	1027	17	39	1277	234	17	7	173	10	170
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Free
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4	8		8	2				Free
Detector Phase	7	4	4	3	8	8	5	2	1	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	
Minimum Split (s)	9.0	23.0	23.0	9.0	23.0	23.0	9.0	15.0	9.0	20.0	
Total Split (s)	20.0	75.0	75.0	10.0	65.0	65.0	10.0	25.0	10.0	25.0	
Total Split (%)	16.7%	62.5%	62.5%	8.3%	54.2%	54.2%	8.3%	20.8%	8.3%	20.8%	
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	
Act Effect Green (s)	14.0	41.9	41.9	35.4	28.1	28.1	7.6	6.4	5.6	8.1	69.4
Actuated g/C Ratio	0.20	0.60	0.60	0.51	0.40	0.40	0.11	0.09	0.08	0.12	1.00
v/c Ratio	0.56	0.35	0.02	0.12	0.65	0.31	0.09	0.18	0.65	0.05	0.11
Control Delay	31.0	8.7	0.1	6.3	18.8	3.4	29.2	20.9	48.7	32.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	8.7	0.1	6.3	18.8	3.4	29.2	20.9	48.7	32.8	0.1
LOS	C	A	A	A	B	A	C	C	D	C	A
Approach Delay		14.4			16.1			24.0		24.9	
Approach LOS		B			B			C		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 69.4
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 16.4
 Intersection LOS: B
 Intersection Capacity Utilization 60.9%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 5: Akers & Constitution



Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	2	25	81	2	11	8	526	40	25	247	5
Future Vol, veh/h	21	2	25	81	2	11	8	526	40	25	247	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	100	0	-	0	170	-	0	200	-	155
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	22	2	26	85	2	12	8	554	42	26	260	5





























Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	910	924	260	899	887	554	265	0
Stage 1	312	312	-	570	570	-	-	-
Stage 2	598	612	-	329	317	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	255	269	779	260	283	532	1299	-
Stage 1	699	658	-	506	505	-	-	-
Stage 2	489	484	-	684	654	-	-	-
Platoon blocked, %								-
Mov Cap-1 Maneuver	242	260	779	243	274	532	1299	-
Mov Cap-2 Maneuver	242	260	-	243	274	-	-	-
Stage 1	695	640	-	503	502	-	-	-
Stage 2	473	481	-	641	636	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.3	25.6	0.1	0.8
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1299	-	-	242	260	779	243	274	532	980	-	-
HCM Lane V/C Ratio	0.006	-	-	0.091	0.008	0.034	0.351	0.008	0.022	0.027	-	-
HCM Control Delay (s)	7.8	-	-	21.4	19	9.8	27.6	18.2	11.9	8.8	-	-
HCM Lane LOS	A	-	-	C	C	A	D	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0.1	1.5	0	0.1	0.1	-	-

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)	34	1380	59	153	1538	33	28	11	21	7	25
Future Volume (vph)	34	1380	59	153	1538	33	28	11	21	7	25
Turn Type	pm+pt	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		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	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	75.0	75.0	10.0	75.0	75.0	10.0	25.0	10.0	25.0	25.0
Total Split (%)	8.3%	62.5%	62.5%	8.3%	62.5%	62.5%	8.3%	20.8%	8.3%	20.8%	20.8%
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 Effect Green (s)	36.8	29.4	29.4	39.4	34.6	34.6	8.8	7.2	8.8	7.2	7.2
Actuated g/C Ratio	0.58	0.47	0.47	0.63	0.55	0.55	0.14	0.11	0.14	0.11	0.11
v/c Ratio	0.14	0.61	0.08	0.61	0.58	0.04	0.13	0.50	0.11	0.03	0.09
Control Delay	6.3	14.1	0.8	20.7	12.3	0.1	25.2	14.0	25.0	31.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	14.1	0.8	20.7	12.3	0.1	25.2	14.0	25.0	31.0	0.6
LOS	A	B	A	C	B	A	C	B	C	C	A
Approach Delay		13.4			12.8			15.8		14.2	
Approach LOS		B			B			B		B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 63

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 13.2









Intersection LOS: B

Intersection Capacity Utilization 66.0%

ICU Level of Service C























Analysis Period (min) 15

Splits and Phases: 2: Hannah Ridge & Constitution

 Ø1	 Ø2	 Ø3	 Ø4
10 s	25 s	10 s	75 s
 Ø5	 Ø6	 Ø7	 Ø8
10 s	25 s	10 s	75 s

Timings
5: Akers & Constitution

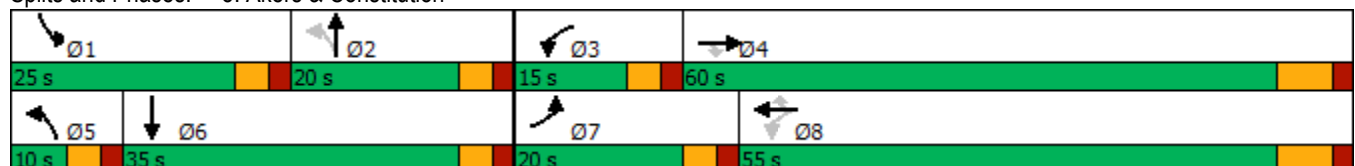
2040 Total Traffic
PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	272	1144	125	155	1367	110	133	51	393	34	224
Future Volume (vph)	272	1144	125	155	1367	110	133	51	393	34	224
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Free
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4	8		8	2				Free
Detector Phase	7	4	4	3	8	8	5	2	1	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	
Minimum Split (s)	9.0	23.0	23.0	9.0	23.0	23.0	9.0	15.0	9.0	20.0	
Total Split (s)	20.0	60.0	60.0	15.0	55.0	55.0	10.0	20.0	25.0	35.0	
Total Split (%)	16.7%	50.0%	50.0%	12.5%	45.8%	45.8%	8.3%	16.7%	20.8%	29.2%	
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	
Act Effect Green (s)	13.2	41.8	41.8	49.0	37.8	37.8	24.3	12.6	17.0	18.8	103.2
Actuated g/C Ratio	0.13	0.41	0.41	0.47	0.37	0.37	0.24	0.12	0.16	0.18	1.00
v/c Ratio	0.65	0.58	0.18	0.59	0.77	0.17	0.36	0.81	0.73	0.11	0.15
Control Delay	52.9	25.3	2.6	21.8	32.5	2.0	36.1	44.7	51.0	34.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	25.3	2.6	21.8	32.5	2.0	36.1	44.7	51.0	34.8	0.2
LOS	D	C	A	C	C	A	D	D	D	C	A
Approach Delay		28.4			29.4			41.6		32.7	
Approach LOS		C			C			D		C	

Intersection Summary













Cycle Length: 120
 Actuated Cycle Length: 103.2
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 30.6
 Intersection LOS: C
 Intersection Capacity Utilization 77.9%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 5: Akers & Constitution



HCM 6th TWSC
17: Akers & Hunter Jumper

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	33.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	5	17	291	5	58	26	234	107	55	344	17
Future Vol, veh/h	14	5	17	291	5	58	26	234	107	55	344	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	100	0	-	0	170	-	0	200	-	155
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	15	5	18	306	5	61	27	246	113	58	362	18

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	868	891	362	799	796	246	380	0	0	359	0	0
Stage 1	478	478	-	300	300	-	-	-	-	-	-	-
Stage 2	390	413	-	499	496	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	273	282	683	~ 304	320	793	1178	-	-	1200	-	-
Stage 1	568	556	-	709	666	-	-	-	-	-	-	-
Stage 2	634	594	-	554	545	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	235	262	683	~ 276	298	793	1178	-	-	1200	-	-
Mov Cap-2 Maneuver	235	262	-	~ 276	298	-	-	-	-	-	-	-
Stage 1	555	529	-	693	651	-	-	-	-	-	-	-
Stage 2	567	580	-	508	519	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.8	106.4	0.6	1.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	235	262	683	276	298	793	1200	-	-
HCM Lane V/C Ratio	0.023	-	-	0.063	0.02	0.026	1.11	0.018	0.077	0.048	-	-
HCM Control Delay (s)	8.1	-	-	21.3	19	10.4	127.2	17.3	9.9	8.2	-	-
HCM Lane LOS	A	-	-	C	C	B	F	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0.1	12.8	0.1	0.2	0.2	-	-

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