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Engineering Review

01/06/2021 2:52:07 PM

dsdrice

JeffRice@elpasoco.com

(719) 520-7877

EPC Planning & Community
Development Department

See comment letter also.

August 5, 2020

Mr. Jim Morley
Morley-Bentley Investments, LLC
20 Boulder Crescent, 1st Floor
Colorado Springs, CO 80903

RE: Homestead North Phase 1
Traffic Impact Study
El Paso County, Colorado
LSC #204380

Dear Mr. Morley:

LSC Transportation Consultants, Inc. has prepared this Traffic Impact Study for Homestead North Phase 1. As shown in Figure 1, Homestead North is located east of Vollmer Road and north of the future extension of Briargate Parkway in El Paso County, Colorado. Homestead North Phase 1 is part of the Sterling Ranch Master Plan area. This report is intended as a site-specific, final plat traffic report for the currently proposed filing.

REPORT CONTENTS

The preparation of this report included the following:

- A list of previous Sterling Ranch traffic reports and traffic reports completed by LSC Transportation Consultants, Inc. for other area developments;
- A summary of the proposed land use and access plan;
- The existing roadway and traffic conditions in the site's vicinity, including the roadway widths, surface conditions, lane geometries, traffic controls, and posted speed limits;
- Existing (2020) traffic-volume data;
- Estimates of projected short-term and long-term traffic volumes;
- The projected average weekday and peak-hour vehicle trips to be generated by the proposed development;
- The assignment of the projected site-generated traffic volumes to the area roadways;
- The projected short-term and long-term total traffic volumes on the area roadways;
- The projected levels of service at the key intersections in the vicinity of the site;
- The recommended street classifications for the internal streets within the proposed development;
- The project's obligation to the County roadway improvement fee program; and
- Recommended roadway improvements

RECENT TRAFFIC REPORTS

LSC prepared a traffic impact study (TIS) for the entire Sterling Ranch development dated June 5, 2008. LSC also prepared a traffic impact analysis for the first phase of the Sterling Ranch development, dated March 16, 2015; a memorandum for Phases 1-3, dated October 2, 2017; and a traffic impact analysis for the Sterling Ranch Phase 2 Preliminary Plan, dated December 20, 2018. The following site-specific, final plat traffic reports have also been prepared:

- *Branding Iron at Sterling Ranch Filing No. 1 and Homestead at Sterling Ranch Filing No. 1*, dated December 19, 2017
- *Sterling Ranch Filing No. 2*, dated April 3, 2018
- *Sterling Ranch Phase 2*, dated December 20, 2018
- *Copper Chase at Sterling Ranch*, dated December 20, 2018
- *Homestead at Sterling Ranch Filing No. 2*, dated March 3, 2020
- *Branding Iron at Sterling Ranch Filing No. 2*, dated March 31, 2020 (revised May 6, 2020)
- *Sterling Ranch Filing No. 2 and Sterling Ranch Phase 2*, dated June 11, 2020

LSC prepared a TIS for the Retreat at TimberRidge, located just north of the Homestead North development, dated January 25, 2018. LSC also prepared transportation memoranda for the Retreat at TimberRidge Preliminary Plan dated June 29th, 2018 and the Retreat at TimberRidge Filing No. 1 dated April 3, 2020.

STUDY AREA

Study Area Land Use

Sketch Plan

Figure 2 shows the location of currently-proposed Homestead North Phase 1 development. These parcels were included as part of traffic analysis zone (TAZ) 21 in the 2008 master traffic impact report. Table 1 shows the land uses assumed for TAZ 21 in the 2008 report and the land uses assumed in this report. A copy of the TAZ map from the 2008 report has been attached. As shown in Table 1, the 2008 report assumed the study area would be developed with 327 single-family homes. This same area is now planned to be developed with about 224 single-family homes. This includes 147 single-family homes currently proposed in Phase 1 and 77 single-family homes assumed in future Homestead North phases.

Study Area Access Plan

The access plan for the current study area is generally consistent with the access plan shown in the master traffic report. The following summarizes the minor change:

- The Sterling Ranch access to Briargate Parkway just east of Vollmer Road (Wheatland Drive) was previously shown as a right-in/right-out-only intersection in the Sketch Plan. The south leg is now proposed as a three-quarter-movement (left-in/right-in/right-out-only) access. A deviation request for this access point has been submitted and approved. The north leg that will serve Homestead North Phase 1 is still proposed to be restricted to right-in/right-out only.

These changes to the plan will result in some localized shifts in intersection turning movements shown in the master traffic study long-term traffic projections, but nothing significant requiring an update to the master study.

CURRENTLY PROPOSED LAND USE AND ACCESS

Land Use and Vehicle Access

Homestead North Phase 1 is planned to include 147 lots for single-family homes. A full-movement site access is proposed to Vollmer Road about 1,410 feet north of Briargate Parkway and 1,370 feet south of Poco Road. An additional access is proposed to Briargate Parkway about 750 feet east of Vollmer Road aligning with Wheatland Drive. In the short term, full-movement access will be allowed at this intersection, as only a half section of Briargate Parkway is planned to be constructed between Vollmer Road and Wheatland Drive. Once Briargate Parkway is widened to the full Principal Arterial cross-section, the north leg serving Homestead North will be restricted to right-in/right-out only and the south leg will be restricted to three-quarter movements (left-in/right-in/right-out only). In the future, Homestead North Phase 1 will also have access through future Homestead North phases and the Retreat at TimberRidge to Poco Road.

Sight Distance Analysis

Figure 3 shows a sight distance analysis at the future intersection to Vollmer Road. Based on a design speed of 40 miles per hour (mph) and the criteria contained in Table 2-21 of the *El Paso County Engineering Criteria Manual (ECM)*, the required intersection sight distance at the future intersections is 445 feet. Based on the criteria contained in Table 2-17 of the ECM, the required stopping sight distance approaching this intersection is 305 feet. As shown in Figure 4, the future intersection analyzed will meet the criteria.

Pedestrian and Bicycle Access

There are no existing schools within two miles of the site. However, there are planned future school sites within the Sterling Ranch Master Plan area south of Briargate Parkway. There are planned sidewalks on Vollmer Road and Briargate Parkway adjacent to the site. School crossings will be needed at the intersection of Briargate Parkway/Vollmer Road. School crossings should not be allowed at the intersection of Briargate Parkway/Wheatland Drive.

EXISTING ROAD AND TRAFFIC CONDITIONS

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 each of them have been attached to this report.

Vollmer Road is currently a five-lane urban street within the City of Colorado Springs limits between Black Forest Road and Cowpoke Road; and a two-lane, rural, paved roadway north of Cowpoke Road extending to north of Hodgen Road. In the southbound direction, Vollmer Road has a posted speed limit of 45 miles per hour (mph). South of Cowpoke Road, Vollmer Road has a 40-mph posted speed limit. The *2040 El Paso County Major Transportation Corridors Plan (MTCP)* and the Sterling Ranch master traffic study show Vollmer Road as a four-lane Urban Minor Arterial adjacent to the site. Vollmer Road is planned to transition to a 2-lane Rural Minor Arterial north of Poco Road. In the interim, auxiliary turn lanes will be completed on Vollmer Road at Briargate Parkway as part of the Homestead at Sterling Ranch Filing No. 2 development.

Marksheffel Road is a Principal Arterial extending north from the City of Fountain to Woodmen Road. Marksheffel Road is planned to ultimately be widened to six lanes and extended north and west from Woodmen Road to connect to Research Parkway at Black Forest Road. Marksheffel Road is shown as a six-lane Principal Arterial through the Sterling Ranch Master Plan area on the El Paso County MTCP.

/Stapleton Road

Briargate Parkway is a six-lane, Principal Arterial that extends east from I-25 to Grand Lawn Circle (about one-half mile east of Powers Boulevard). Briargate Parkway is planned ultimately to extend to Towner Drive. The section of Briargate Parkway between Vollmer Road and the first Sterling Ranch access (Wheatland Drive) is planned to be constructed in the short-term with the Homestead at Sterling Ranch Filing No. 2 development.

Address Poco Road
Existing Traffic Volumes

as a partial
cross-section

Figure 4 shows the existing (2020) peak-hour traffic volumes at the intersections of Dines/Vollmer. The traffic volumes shown for the intersection of Dines/Vollmer were based on traffic counts conducted by LSC in May 2020. These traffic counts were conducted at a time when COVID-19 pandemic-related restrictions were in place. However, traffic counts conducted at the intersection of Black Forest Road/Vollmer Road in December 2019 (pre-pandemic) and repeated during the same week that the Dines/Vollmer counts were conducted indicate only minor impacts to traffic volumes on Vollmer Road due to these restrictions. The traffic count sheets are attached.

Figure 4 also shows the daily traffic volumes on Vollmer Road in the vicinity of the site. These volumes are estimates by LSC, based on the 2020 peak-hour counts and the ratio of peak-hour to daily traffic volumes from 24-hour traffic counts conducted on Vollmer Road just south of Poco Road by LSC in 2017.

BACKGROUND (BASELINE) CONDITIONS

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 the through traffic and the traffic generated by nearby developments, but assumes zero traffic generated by Homestead North Phase 1.

Figure 5 shows the projected short-term background traffic volumes at the key area intersections. The short-term background volumes assume a half section of Briargate Parkway has been constructed between Vollmer Road and Wheatland Drive and that full-movement access is permitted at the intersection of Briargate/Wheatland. The short-term background traffic includes the existing traffic volumes (from Figure 3) plus increases in through traffic due to regional growth, plus traffic estimated to be generated by buildout of the Homestead at Sterling Ranch Filings 1 and 2, Branding Iron at Sterling Ranch Filings 1 and 2, Sterling Ranch Filing No. 2, Sterling Ranch Phase 2, and the Retreat at TimberRidge Filing No. 1 to be located generally northeast of the intersection of Vollmer Road and Poco Road.

Figure 6 shows the projected 2040 background traffic volumes at the key area intersections. 2040 background traffic volume estimates were based on 2040 volume projections in the *El Paso County Major Transportation Corridors Plan* (MTCP) and previous work completed in the area by LSC, including the *Sterling Ranch Updated Traffic Impact Analysis* by LSC (dated June 5, 2008) and the *Retreat at TimberRidge Updated Traffic Impact Analysis* by LSC (dated January 25, 2018). The 2040 background traffic volumes assume buildout of the Sterling Ranch development, including future phases of Homestead North, and buildout of the Retreat at TimberRidge. The 2040 background traffic assumes Briargate Parkway has been constructed between Black Forest Road and Towner Avenue and that the intersection of Briargate/Wheatland is restricted to a three-quarter movement (left-in/right-in/right-out only) for the south leg and right-in/right-out only for the north leg. The 2040 background traffic also assumes a connection between the intersection of Wheatland/Briargate and Poco Road through the Homestead North area.

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 1 shows the trip-generation estimates.

Homestead North Phase 1 is projected to generate about 1,388 new external vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 27 vehicles would enter and 82 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 92 vehicles would enter and 54 vehicles would exit the site.

 /Stapleton Road

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated traffic volumes on the street and roadway system serving the site is one of the most important factors in determining the site's traffic impacts. The specific short-term and intermediate-term distribution estimates are shown in Figure 7. The directional distribution estimates are based on the following factors: the location of the site with respect to the Colorado Springs metropolitan area, the planned access system for the site, the street and roadway system serving the site, the land uses proposed for the site, and the distribution of existing traffic volumes at the intersection of Dines Boulevard/Vollmer. The short-term distribution estimate assumes only the short section of Briargate Parkway between Vollmer Road and Wheatland Drive has been constructed in the vicinity of the site and the long-term distribution estimate assumes full buildout of the future roadway network in the vicinity of the site.

When the distribution percentages (from Figure 7) are applied to the trip-generation estimates (from Table 1), the resulting site-generated traffic volumes can be determined. Figures 8 and 9 show the short-term and 2040 site-generated traffic volume estimate for Homestead North Phase 1. The short-term site-generated traffic volumes assume the intersection of Briargate/Wheatland as an interim full-movement intersection. The long-term site-generated traffic volumes assume the north leg of this intersection has been restricted to right-in/right-out only.

TOTAL TRAFFIC

Short-Term Total Traffic Volumes

Figure 10 shows the projected short-term total traffic volumes at the intersection of Briargate/Vollmer and the site access points. The short-term total traffic volumes are the sum of the short-term background traffic volumes (from Figure 5) and the short-term site-generated traffic volumes (from Figure 8).

2040 Total Traffic Volumes

Figure 11 shows the projected 2040 total traffic volumes at the intersection of Briargate/Vollmer and the site access points. The 2040 total traffic volumes are the sum of the 2040 background traffic volumes (from Figure 6) and the long-term site-generated traffic volumes (from Figure 9).

LEVEL OF SERVICE ANALYSIS

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 intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections. Table 2 shows the level of service delay ranges.

Table 2: 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 intersection of Briargate/Vollmer and the site access points have been analyzed to determine the projected intersection levels of service for short-term and 2040 background and total traffic scenarios for the morning and afternoon peak-hour periods. The short-term analysis of the intersection of Briargate/Vollmer and the short-term and 2040 analysis of the site access points were based on the unsignalized intersection analysis procedures from the *Highway Capacity Manual, 6th Edition*. The intersection of Briargate/Vollmer was analyzed as a signalized intersection using Synchro for the 2040 analysis. Figures 5, 6, 10, and 11 show the level of service analysis results. The level of service reports are attached.

Briargate Parkway/Vollmer Road

The intersection of Briargate/Vollmer is projected to operate at a satisfactory level of service (LOS C or better) as a stop sign-controlled intersection, based on the short-term total traffic. This analysis assumes Briargate Parkway has only been extended east of Vollmer Road to Wheatland Drive. By 2040, it was assumed that Briargate Road would be extended east to Black Forest Road and west to connect to its current terminus. It was also assumed that the intersection of Briargate/Vollmer would be signal-controlled by 2040. This intersection is projected to operate at an overall satisfactory level of service (LOS D or better) as a signalized intersection.

Briargate Parkway/Wheatland Drive

The intersection of Briargate/Wheatland is projected to operate at a LOS B or better for all movements as a full-movement stop sign-controlled intersection, based on the short-term total traffic. This analysis assumes a half section of Briargate Parkway has been constructed between Vollmer Road to Wheatland Drive. By 2040, it was assumed that the Briargate Parkway would be constructed to its full Principal Arterial cross-section and the south leg of the intersection of Briargate/Wheatland would be restricted to three-quarter movement (left-in/right-in/right-out only) and the north leg would be restricted to right-in/right-out only. Based on the 2040 total

traffic volumes and lane geometry shown in Figure 11, all movements at this intersection are projected to operate at LOS D or better during the peak hours.

Vollmer Road/Site Access

The full-movement site access point to Vollmer Road is projected to operate at LOS C or better for all movements during the peak hours as a stop sign-controlled intersection, based on the projected short-term and 2040 total traffic volumes.

SUBDIVISION STREET CLASSIFICATIONS

Figure 12 shows the recommended street classifications for the streets in the vicinity of the site.

AREA MTCP 2040 ROADWAY IMPROVEMENT PROJECTS

The *El Paso County 2016 Major Transportation Corridors Plan Update* identified the following 2040 roadway improvement projects within the study area:

- C13: Vollmer Road, from Marksheffel Road to Stapleton Drive, as a Rural 4-Lane Minor Arterial
- N5 Stapleton Drive [Briargate Parkway], from Towner Road to Black Forest Road, as a 4-Lane Urban Principal Arterial
- N12: Marksheffel Road, from Woodman Road to Research Parkway, as a 4-Lane Urban Principal Arterial
- M11: Vollmer Road Bicycle & Primary Regional Trail, from Marksheffel Road to Shoup Road

(Briargate Pkwy)

Address potential extension of project to Poco (?) due to projected link ADT

ROADWAY IMPROVEMENTS

Vollmer Road

Roadway improvements to Vollmer Road including auxiliary turn lanes, as discussed in our October 2, 2017 transportation memorandum, are required as part of the Subdivision Improvements Agreement (SIA) for Homestead at Sterling Ranch Filing No. 1 and Branding Iron at Sterling Ranch Filing No. 1. The applicant will be constructing an interim cross section for Vollmer Road between Marksheffel Road and Briargate Parkway, no later than May 30, 2021. The interim road improvement would widen the roadway to the east side. There would continue to be one through lane in each direction, but the interim road improvements would allow for southbound left-turn and northbound right-turn lanes at the intersection of Briargate Parkway/Vollmer Road. The developer will be responsible for funding all roadway improvements.

TRANSPORTATION IMPROVEMENT FEE PROGRAM

The applicant will be required to participate in the Countywide Transportation Improvement Fee Program. These projects will annex into the 10 mil PID, which has a per-lot upfront building permit fee of \$1,221 per dwelling unit. The total building permit fee amount for the 147 lots within Homestead North Phase 1 would be \$179,487.

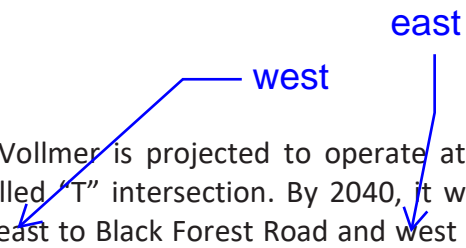
CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

Homestead North Phase 1 is projected to generate about 1,388 new external vehicle trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 27 vehicles would enter and 82 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 92 vehicles would enter and 54 vehicles would exit the site.

Level of Service

- In the short term, the intersection of Briargate/Vollmer is projected to operate at a satisfactory level of service as a stop sign-controlled "T" intersection. By 2040, it was assumed that Briargate Road would be extended east to Black Forest Road and west to connect to its current terminus. It was also assumed that the intersection of Briargate/Vollmer would be signal controlled by 2040. This intersection is projected to operate at an overall satisfactory level of service (LOS D or better) as a signalized intersection.
- The proposed site access points to Vollmer Road and Briargate Parkway are projected to operate at a satisfactory level of service as stop sign-controlled intersections, based on the short-term and 2040 total traffic volumes and lane geometry shown in Figures 10 and 11.



Recommended Improvements

A list of all improvements in the vicinity of the site is presented in Table 3.

* * * * *

Please contact me if you have any questions regarding this report.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

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

KDF:jas

Enclosures: Tables 1 and 3
Figures 1-12
TAZ Map
MTCP Maps
Traffic Count Reports
Level of Service Reports

Tables and Figures



Table 1
Trip Generation Estimate
Homestead North Phase 1

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total External Trips Generated					
			Average Weekday Traffic		Morning Peak Hour		Evening Peak Hour		Average Weekday Traffic		Morning Peak Hour		Evening Peak Hour	
			In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Trip Generation Estimate for the Currently Proposed Homestead North Phase 1														
210	Single-Family Detached Housing	147 DU ⁽²⁾	9.44	0.19	0.56	0.62	0.37	0.37	1,388	27	82	92	54	
Trip Generation Estimate for Future Homestead North Phases														
210	Single-Family Detached Housing	77 DU	9.44	0.19	0.56	0.62	0.37	0.37	727	14	43	48	28	
		224 DU							2,115	41	125	140	82	
Trip Generation Estimate for TAZ 21 From the Sterling Ranch Updated Traffic Impact Analysis June 5, 2008														
210	Single-Family Detached Housing	327 DU	9.57	0.19	0.56	0.64	0.37	0.37	3,129	61	184	208	122	
	Change in trip generation estimate	-103 DU							-1,014	-20	-59	-68	-40	

Notes:

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

(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.

Add a line for "Vollmer Road safety improvements - lane and shoulder widening between Poco Road and Marksheffel Road", include timing, etc.; Sam Bass to Marksheffel (in areas where plans are not currently approved) with Homestead North phase TBD.

Table 3

Homestead North				
Roadway Improvements				
Item	Improvement	Improvement Description	Timing	Responsibility ⁽¹⁾
1	Roadway Segment	Construct the south half-section of Briargate Parkway between Vollmer Road and Wheatland Drive	With Homestead at Sterling Ranch Fil No. 2	Sterling Ranch
2	Roadway Segment	Construct Briargate Parkway to the full Urban Principal Arterial cross section between Vollmer Road and Wheatland Drive	Long-Term Future	Sterling Ranch
3	Roadway Segment	Construct Briargate Parkway as an Urban Principal Arterial between Wheatland Drive and the east Sterling Ranch boundary	Long-Term Future	Sterling Ranch
4	Roadway Segment	Construct Briargate Parkway as an Urban Principal Arterial between the east Sterling Ranch boundary and Townner Avenue	Long-Term Future	Others
5	Roadway Segment	Construct Briargate Parkway as an Urban Principal Arterial between Black Forest Road and Vollmer Road	Long-Term Future	Others
6	Roadway Segment	Upgrade Vollmer Road generally between the south boundary of Sterling Ranch and future Briargate Parkway to an Urban Minor Arterial cross section (five lanes)	Designed MTCP Project ID C-13	Sterling Ranch Metro District
7	Roadway Segment	Upgrade Vollmer Road between future Briargate Parkway and Poco Road to an Urban Minor Arterial cross section (five lanes)	Future MTCP Project ID U-12 (Note: MTCP indicates two-lane Rural Minor Arterial.)	(Sterling Ranch Metro District) MTCP Master- Planned MTCP Project ID U-12
8	Roadway Segment	As shown on the County MTCP: Vollmer Road upgrade between Poco Road and Shoup Road to a county-standard, two-lane Rural Minor Arterial.	Traffic volume estimates indicate this improvement will not be needed in the short-term horizon. The 2040 MTCP indicates the Vollmer project will be needed by 2040. The 2040 MTCP shows the Vollmer upgrade "project" as Project ID U-12.	EI Paso County
9	Auxiliary Lane	Construct northbound right-turn deceleration lane and southbound left-turn lane on Vollmer approaching Briargate Parkway	Road improvements to Vollmer Road including auxiliary turn lanes as discussed in our October 2, 2017 transportation memorandum are required as part of the Subdivision Improvements Agreement (SIA) for Homestead at Sterling Ranch Filing No. 1 and Branding Iron at Sterling Ranch Filing No. 1. The applicant will be constructing an interim cross section for Vollmer Road between Marksheffel Road and Briargate Parkway no later than May 30, 2021. The interim road improvement would widen the roadway to the east side. There would continue to be one through lane in each direction, but the interim road improvements would allow for southbound left-turn and northbound right-turn lanes.	Sterling Ranch
12	Auxiliary Lane	Construction a northbound right-turn deceleration lane on Vollmer Road approaching the proposed full-movement site access (recommended length 155' plus a 160' taper)	With Homestead North Future Phases Or With the Upgrade of Vollmer Road between future Briargate Parkway and Poco Road to an Urban Minor Arterial cross section (five lanes)	Sterling Ranch
13	Auxiliary Lane	Construction a southbound left-turn lane on Vollmer Road approaching the proposed full-movement site access (recommended length 205' plus a 160' taper)	Future With the Upgrade of Vollmer Road between future Briargate Parkway and Poco Road to an Urban Minor Arterial cross section (five lanes)	Sterling Ranch
14	Auxiliary Lane	Construction a westbound right-turn deceleration lane on Briargate Parkway approaching Wheatland Drive (recommended length 235' plus a 200' taper)	Future With the construction of Briargate Parkway east of Wheatland Drive	Sterling Ranch

Source: LSC Transportation Consultants, Inc.

August 2020

or earlier if directed by the County Engineer with a Sterling Ranch subdivision



Approximate Scale
Scale: 1" = 3,000'



Figure 1
Vicinity
Map

Homestead North Phase 1 (LSC #204380)





Approximate Scale
NTS



Retreat at Timber Ridge

Poco Rd.

Future Phase

Future Connection

Phase 1

Proposed Right-in/Right-out Access (interim full movement)

Proposed Full-Movement Access

Briargate Pkwy.

Vollmer Rd.

Wheatland Dr.

1370'

1410'




750'

Figure 2
Site Plan

Homestead North Phase 1 (LSC #204380)



LEGEND:

-  = ECM Required Intersection Sight Distance (445' based on a design speed of 40mph from Table 2-21)
-  = ECM Required Stopping Sight Distance (travel path) (305' based on a design speed of 40mph from Table 2-17)
-  = Stopping Sight Distance Sight Line

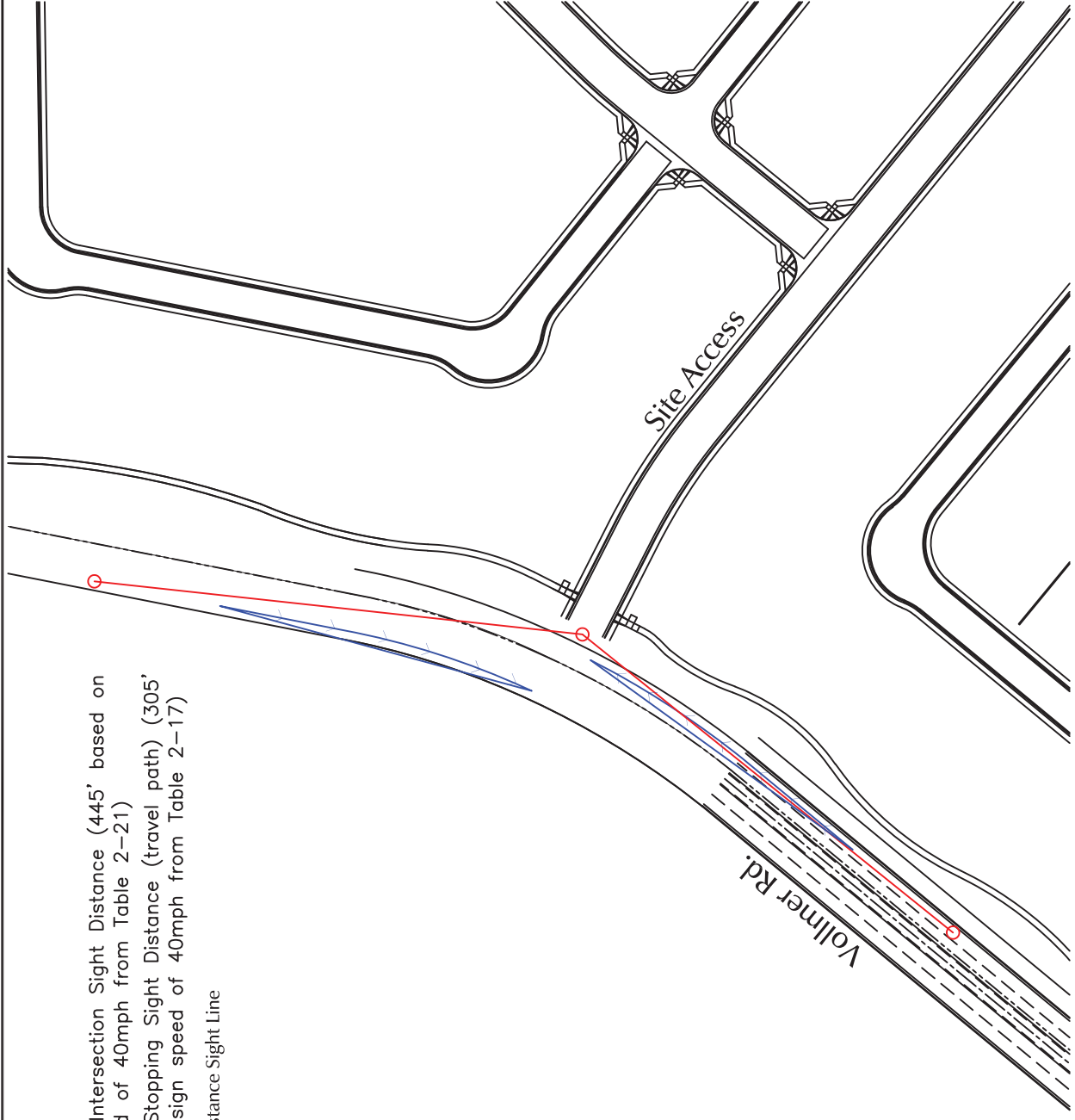
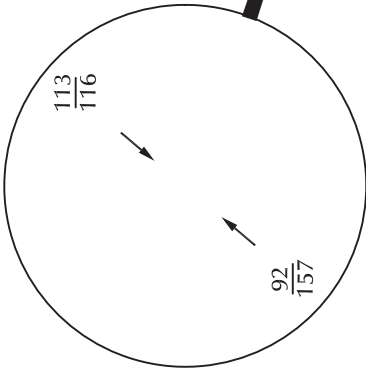


Figure 3
Sight Distance Analysis
Homestead North Phase 1 (LSC #204380)





LEGEND:

- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour) Based on counts by LSC May 2020
- $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
- XXX = Average Weekday Traffic (vehicles per day) Estimate by LSC

Note: Counts may be impacted by restrictions due to the COVID-19 pandemic.

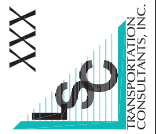


Figure 4

Existing Traffic

Homestead North Phase 1 (LSC #204380)

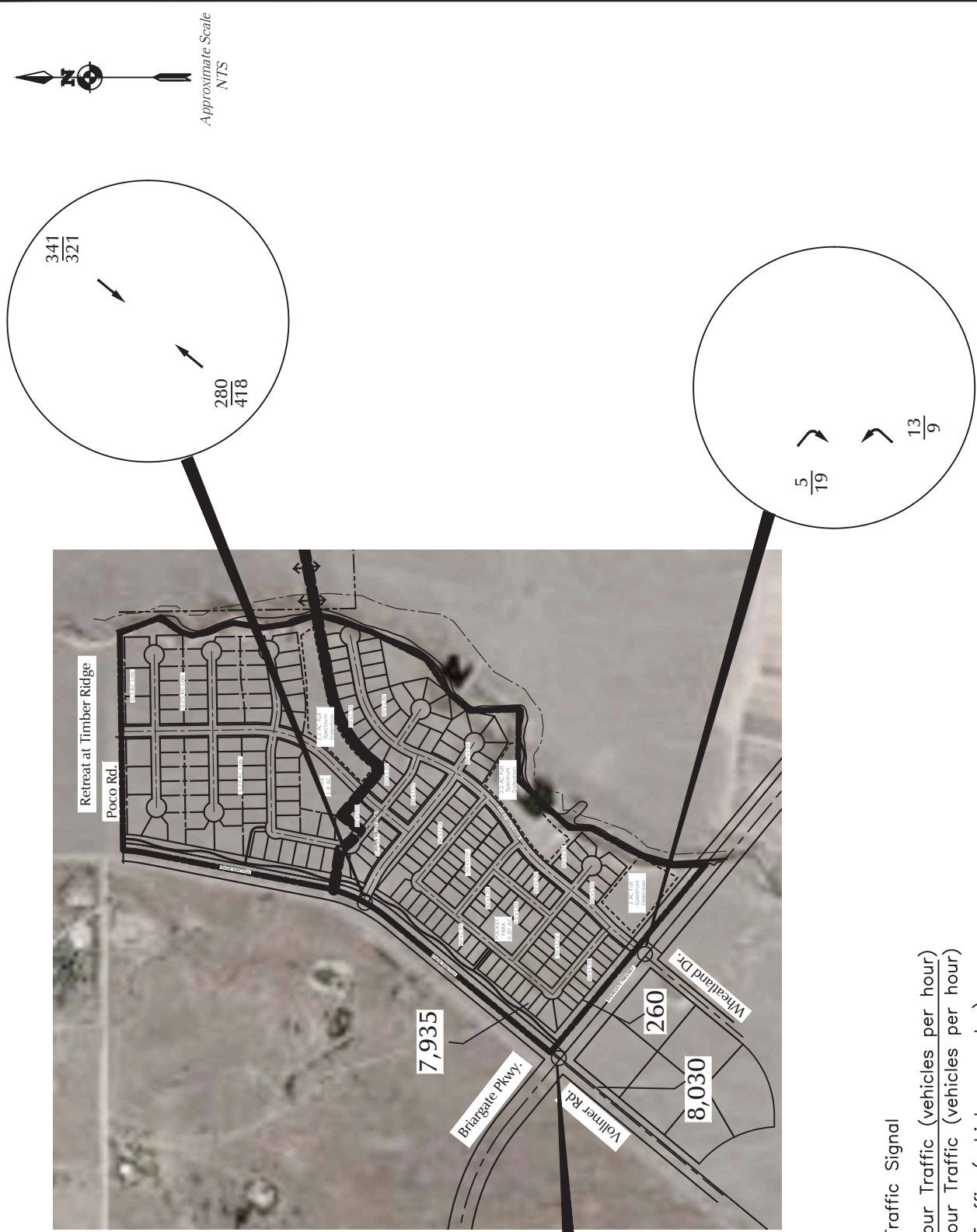
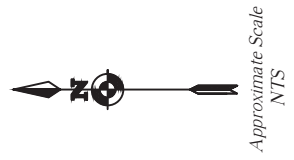


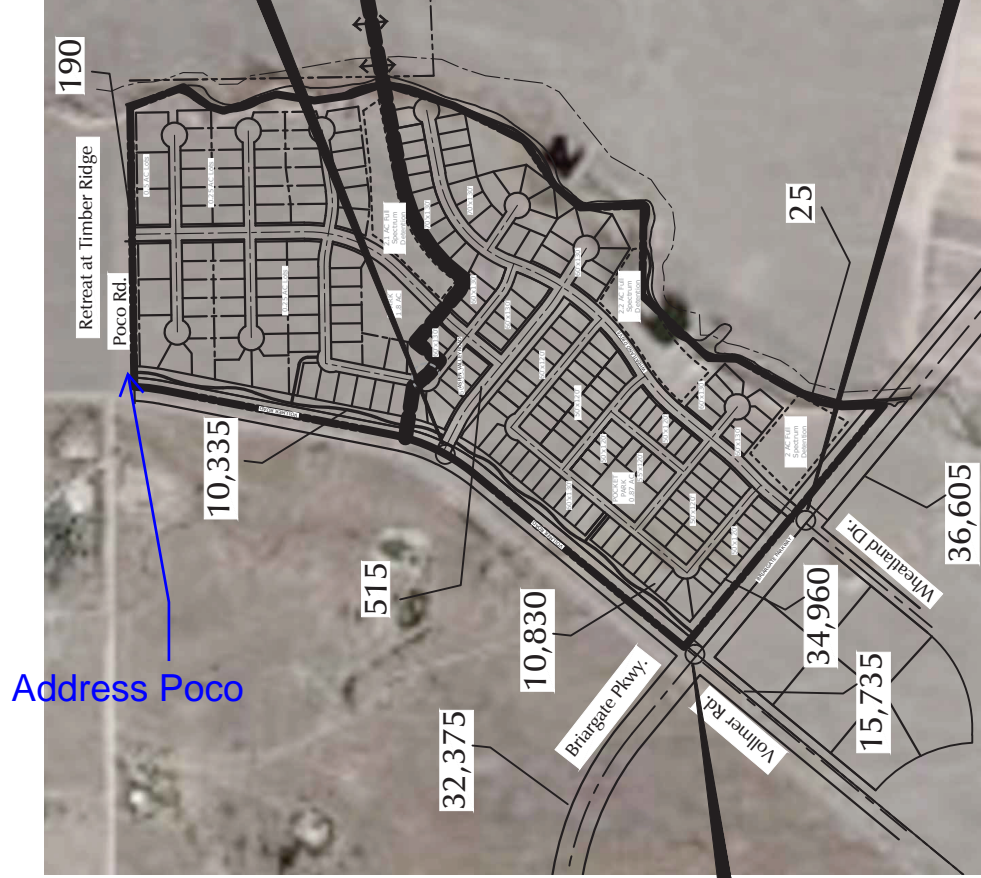
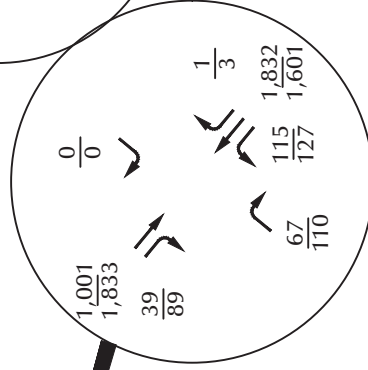
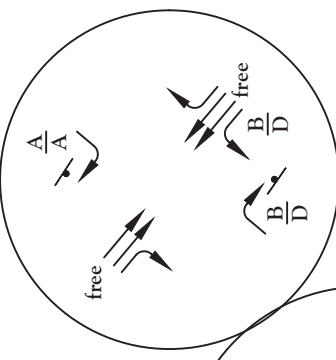
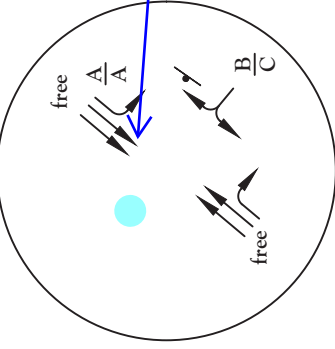
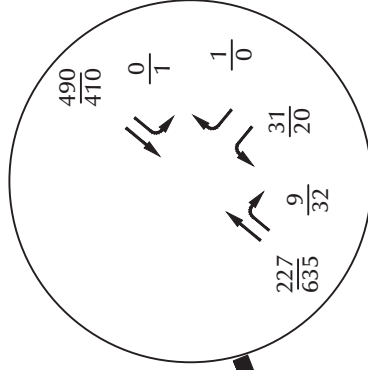
Figure 5
Short-term Background Traffic
 Homestead North Phase 1 (LSC #204380)

- 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)
 - XXX = Average Weekday Traffic (vehicles per day)
 - $\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service
 - $\frac{B}{B}$ = PM Individual Movement Peak-Hour Level of Service
 - $\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service
 - $\frac{D}{D}$ = PM Entire Intersection Peak-Hour Level of Service

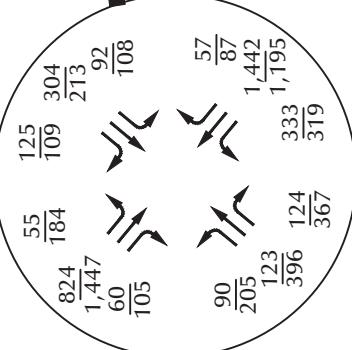
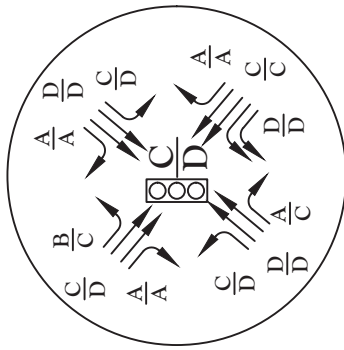




4 lanes to Poco?



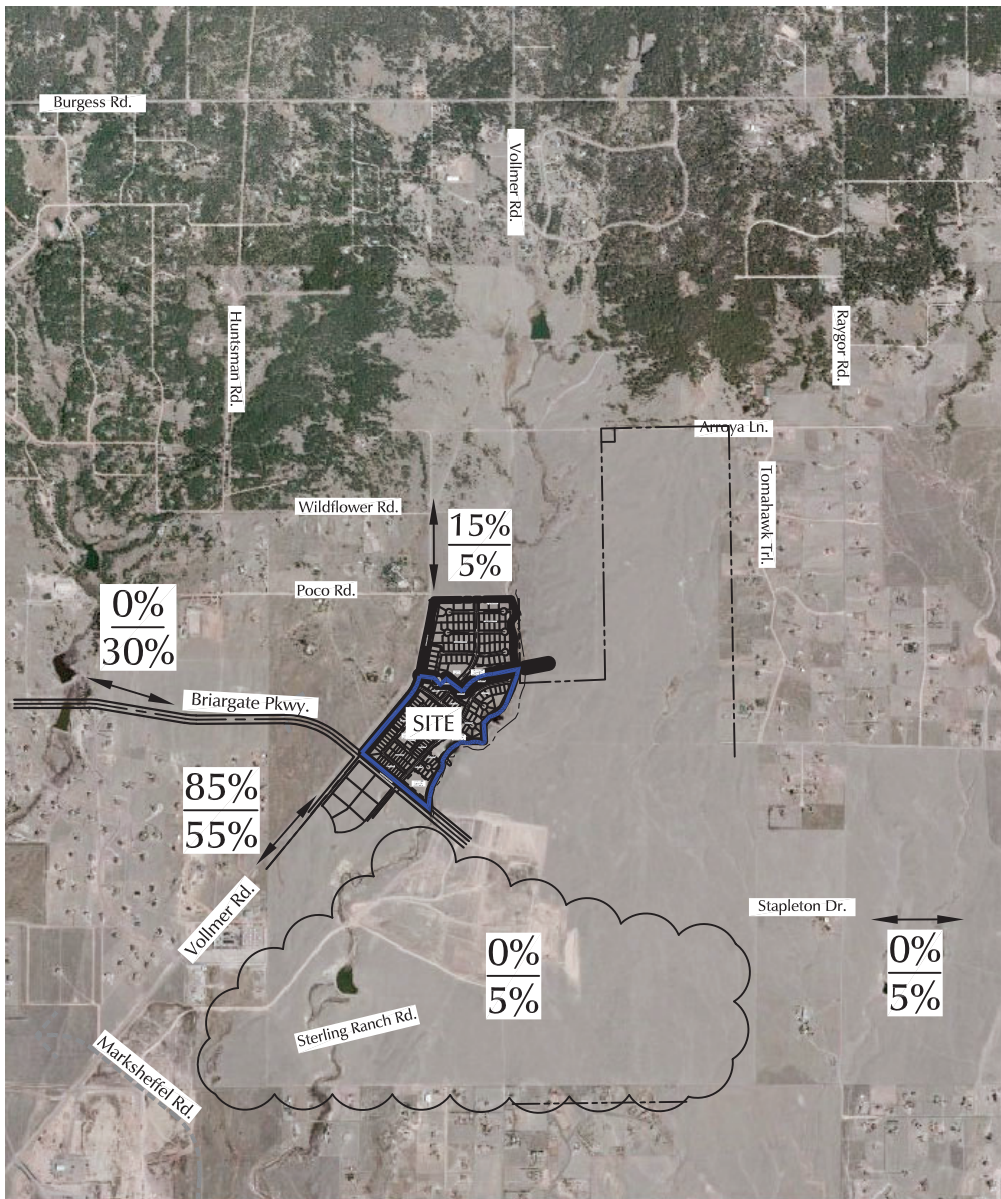
Address Poco




LEGEND:

- = Traffic Signal
- = Stop Sign
- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
- XXX = Average Weekday Traffic (vehicles per day)
- $\frac{A}{B}$ = 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






 Approximate Scale
 Scale: 1" = 3,000'

LEGEND:

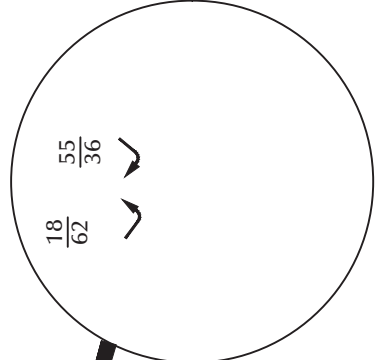
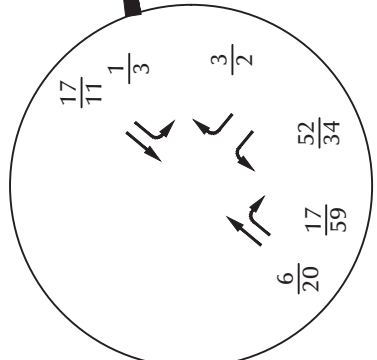
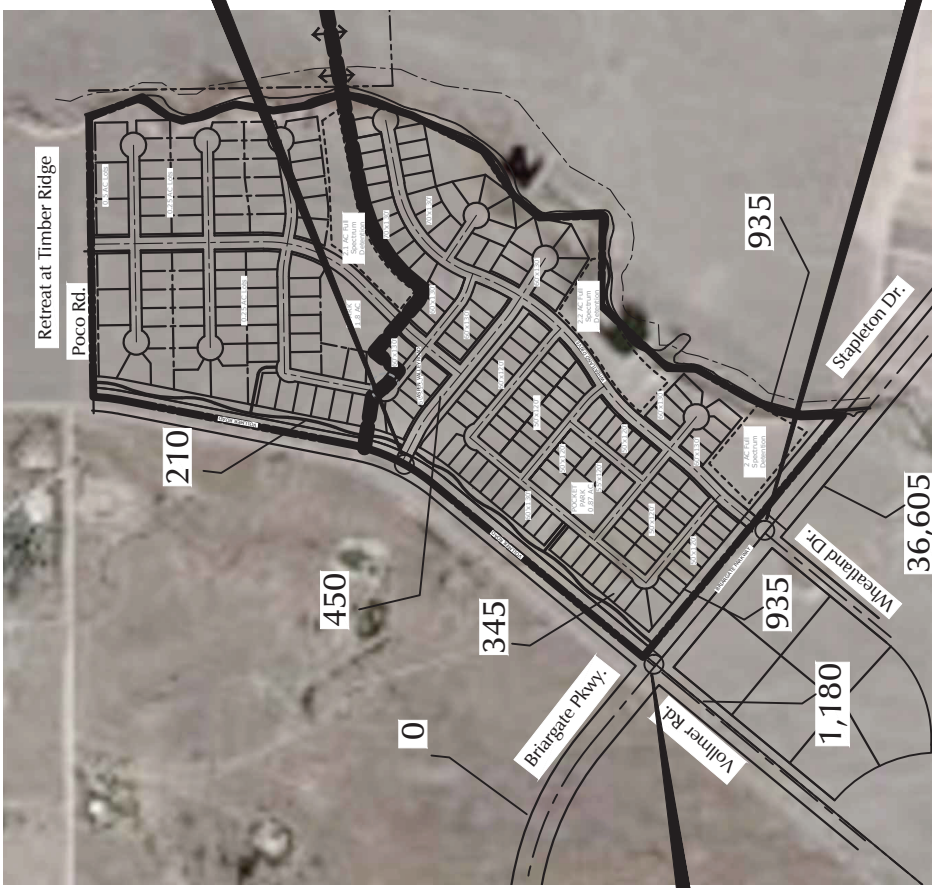
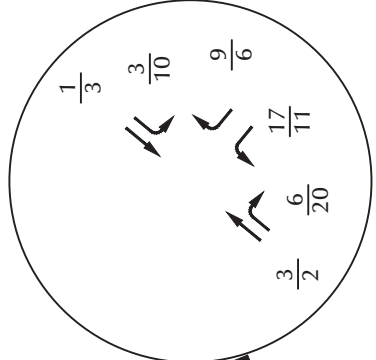
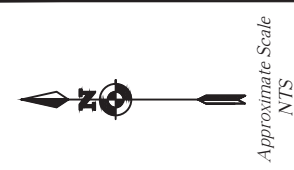
$\frac{XX\%}{XX\%}$ = $\frac{\text{Short-Term Percent Directional Distribution}}{\text{Long-Term Percent Directional Distribution}}$

Figure 7

Directional Distribution of Site-Generated Traffic

Homestead North Phase 1 (LSC #204380)





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)

XXX = Average Weekday Traffic (vehicles per day)

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

$\frac{C}{D}$ = 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

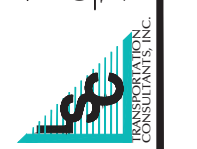
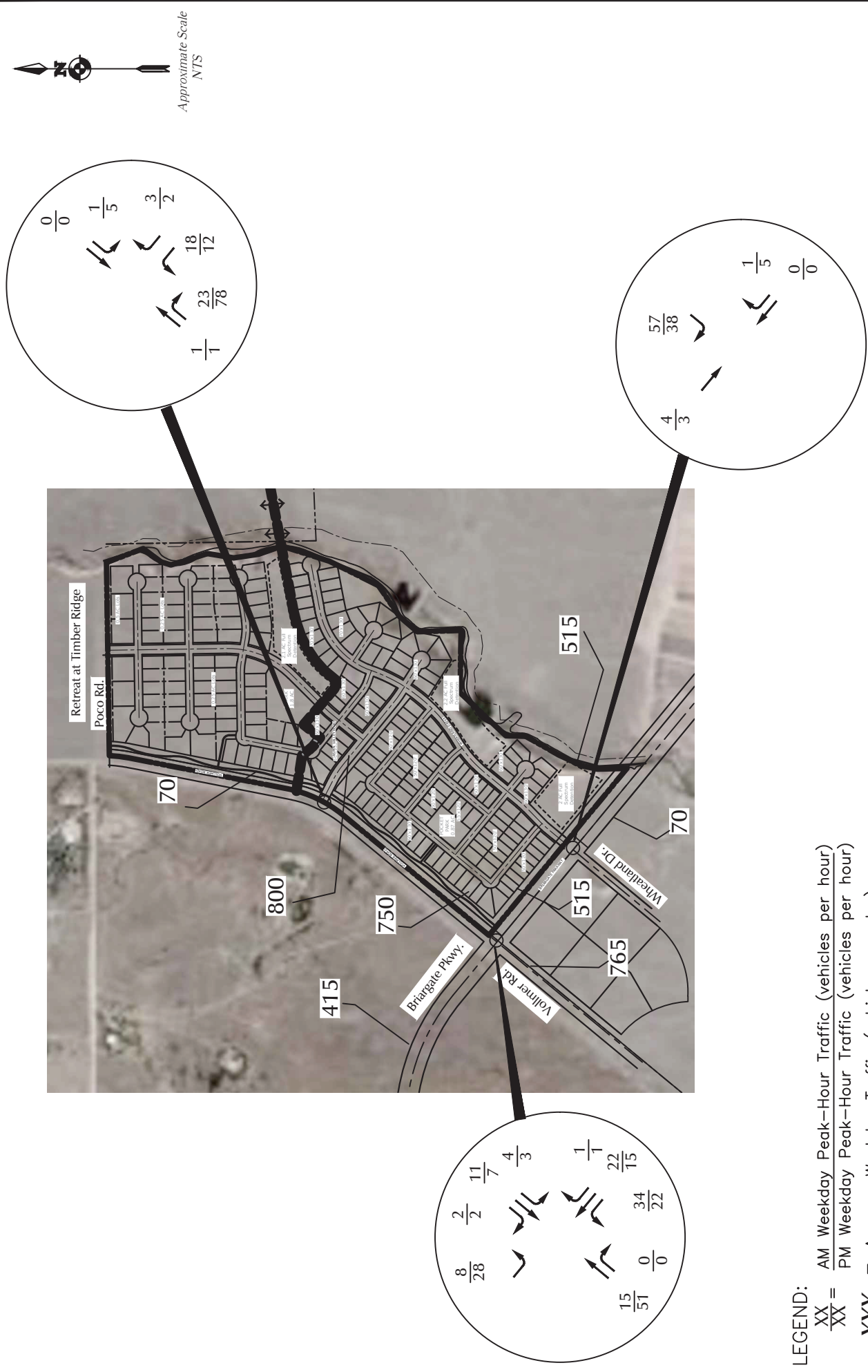


Figure 8
Short-Term Site-Generated Traffic
 Homestead North Phase 1 (LSC #204380)



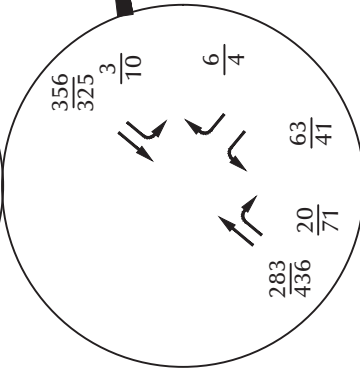
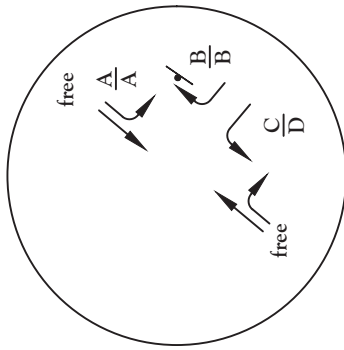
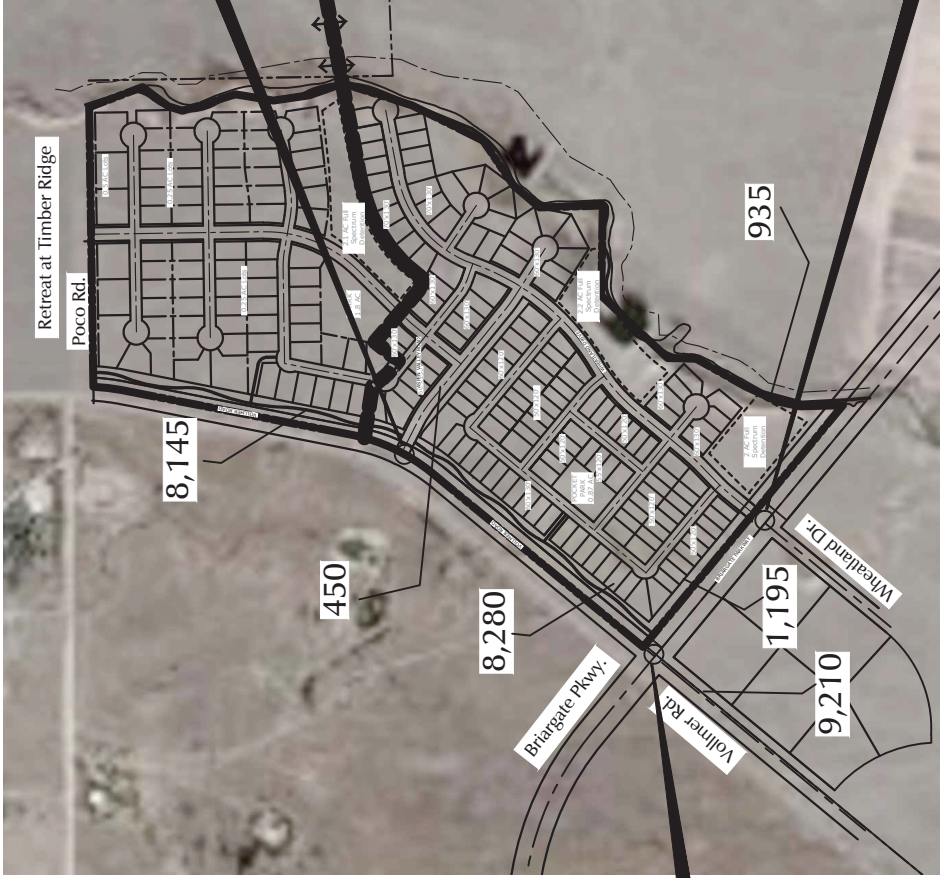
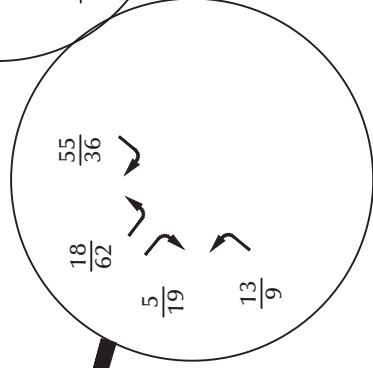
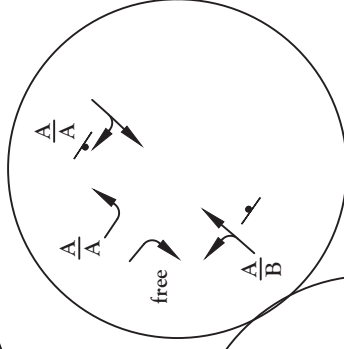
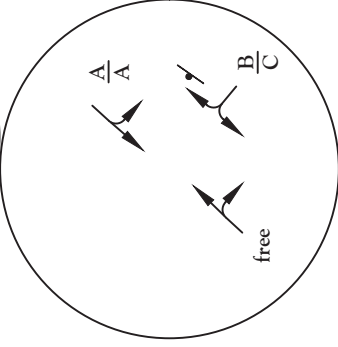
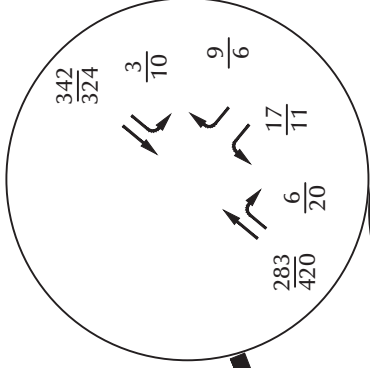
LEGEND:
 XX = AM Weekday Peak-Hour Traffic (vehicles per hour)
 XX = PM Weekday Peak-Hour Traffic (vehicles per hour)
 XXX = Average Weekday Traffic (vehicles per day)

Figure 9
 Long-Term Site-Generated Traffic
 Homestead North Phase 1 (LSC #204380)





Approximate Scale
NTS



LEGEND:

⊥ = Stop Sign

⊞ = Traffic Signal

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

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

XXX = Average Weekday Traffic (vehicles per day)

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

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

C = AM Entire Intersection Peak-Hour Level of Service

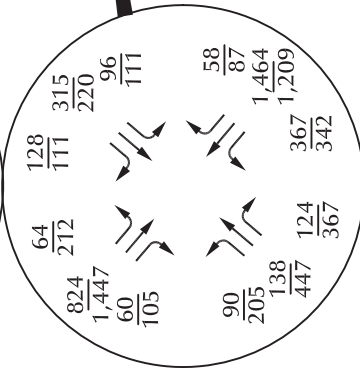
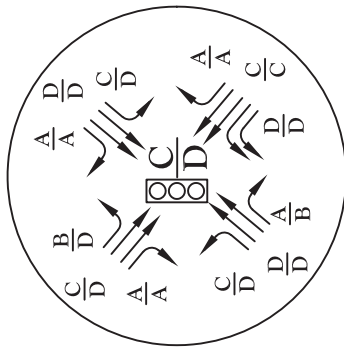
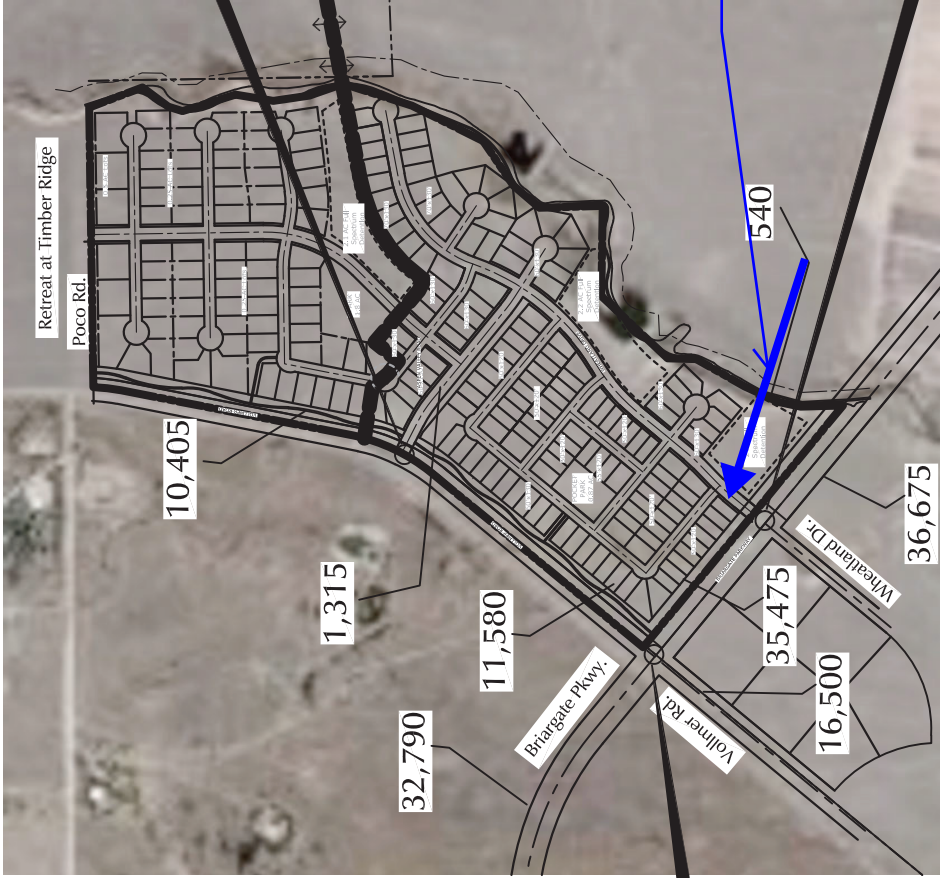
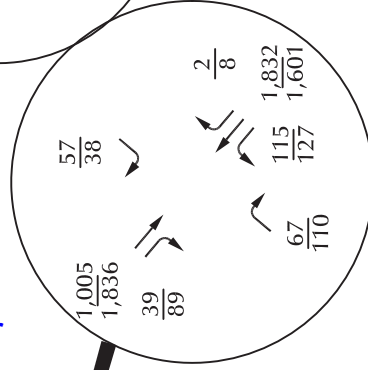
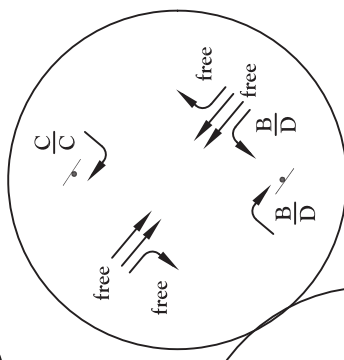
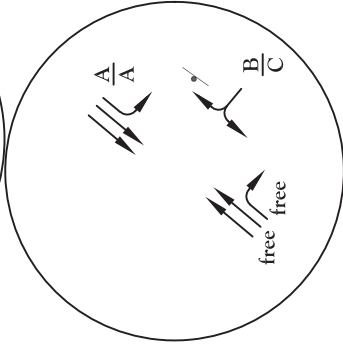
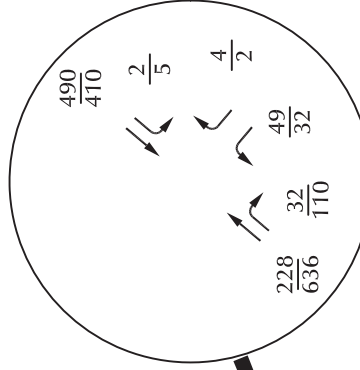
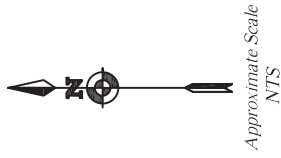
D = PM Entire Intersection Peak-Hour Level of Service

Figure 10

Short-Term Total Traffic

Homestead North Phase 1 (LSC #204380)










LEGEND:

- ⊥ = Stop Sign
- ⊡ = Traffic Signal
- 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)
- A/B = AM Individual Movement Peak-Hour Level of Service
PM Individual Movement Peak-Hour Level of Service
- C/D = AM Entire Intersection Peak-Hour Level of Service
PM Entire Intersection Peak-Hour Level of Service

Figure 11
2040 Total Traffic
 Homestead North Phase 1 (LSC #204380)



LEGEND:

-  = Urban Principal Arterial
-  = Urban Minor Arterial (4 lanes)
-  = Rural Minor Arterial (2 lanes)
-  = Urban Local
-  = Urban Local (low volume)

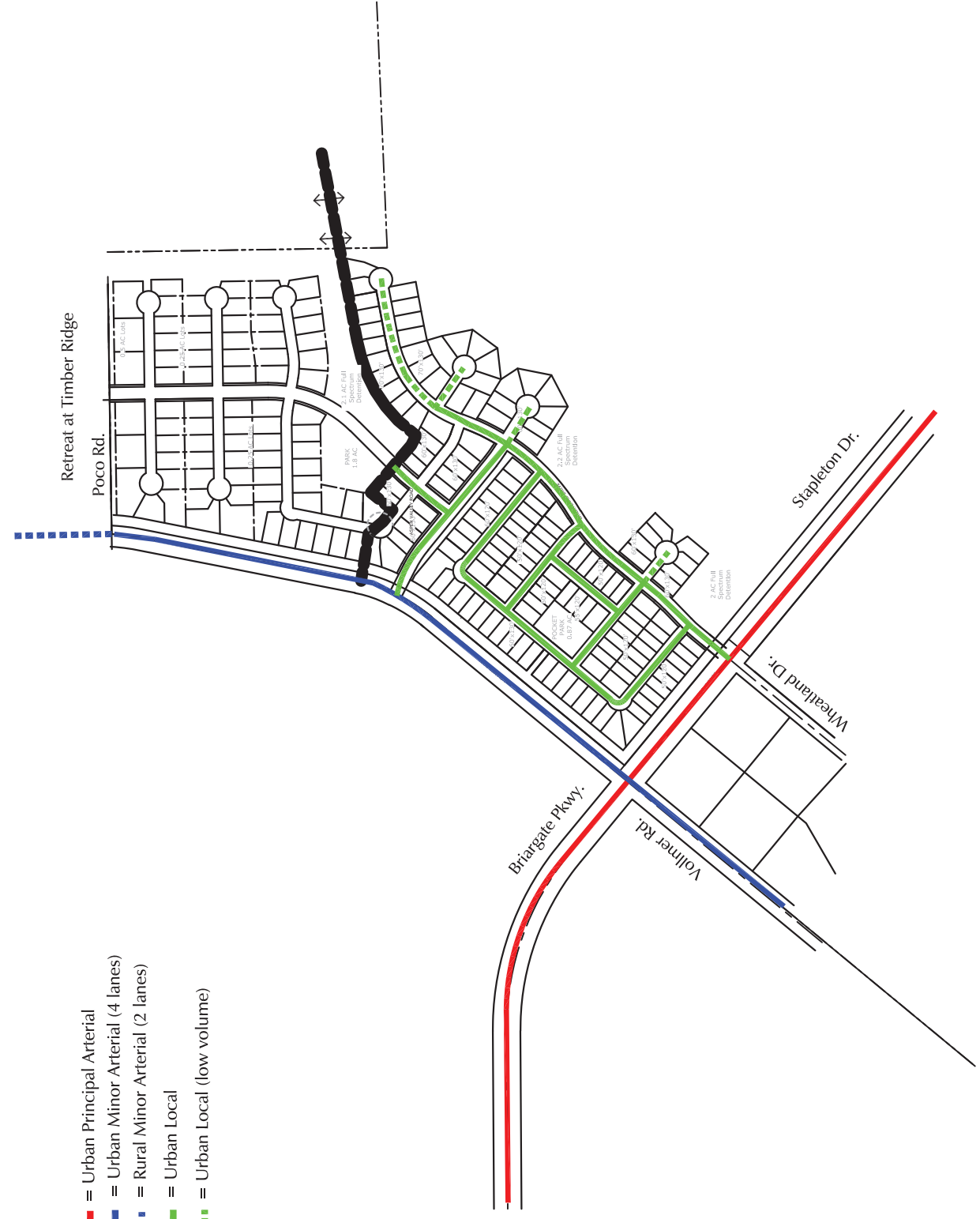


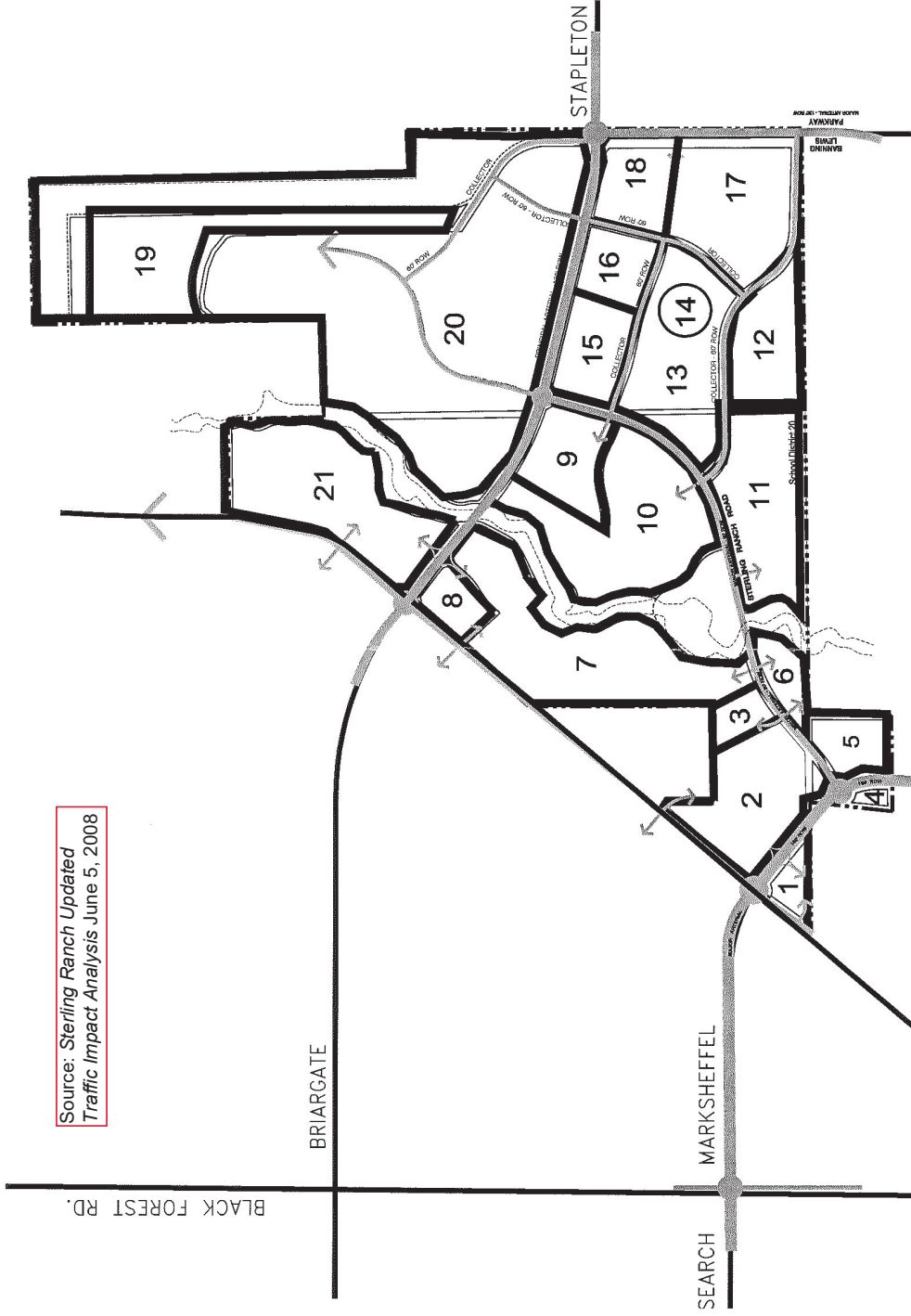
Figure 12
Recommended Classification
 Homestead North Phase 1 (LSC #204380)



TAZ Map



Source: Sterling Ranch Updated
Traffic Impact Analysis June 5, 2008



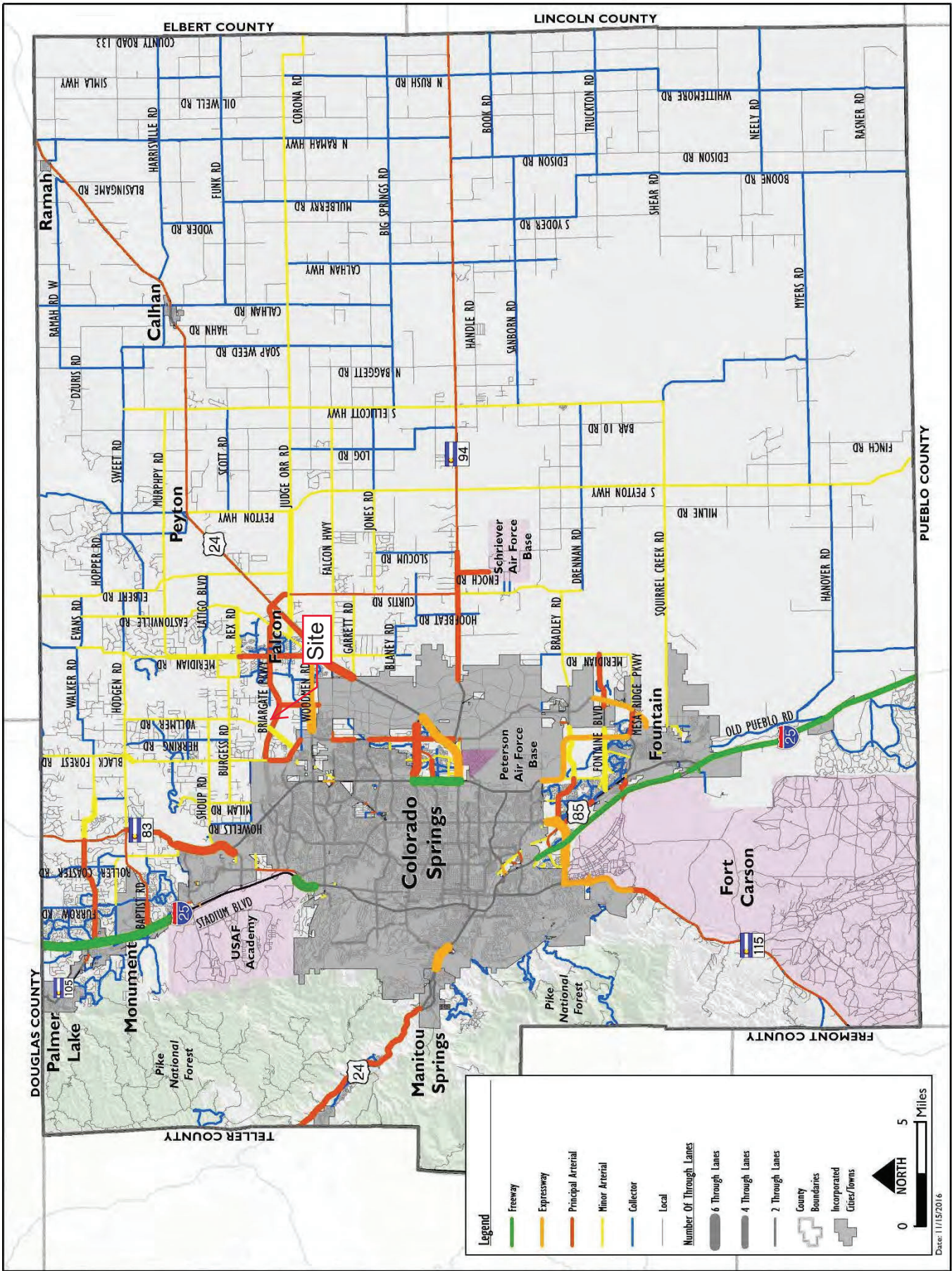
Traffic Analysis Zones
Sterling Ranch

Figure 3
LSC # 074230



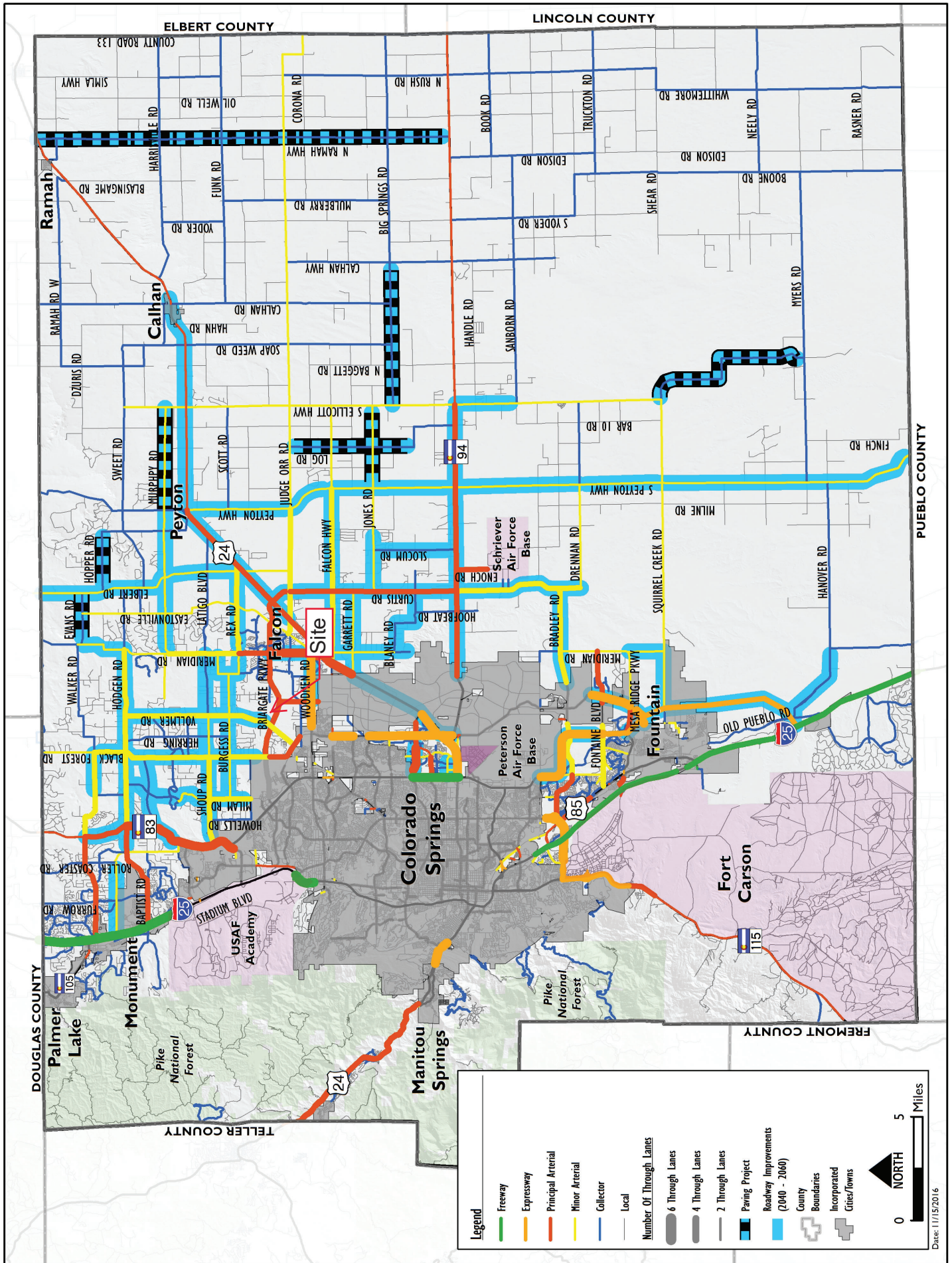
MTCP Maps





Map 14: 2040 Roadway Plan (Classification and Lanes)

Map 17: 2060 Corridor Preservation



Traffic Counts

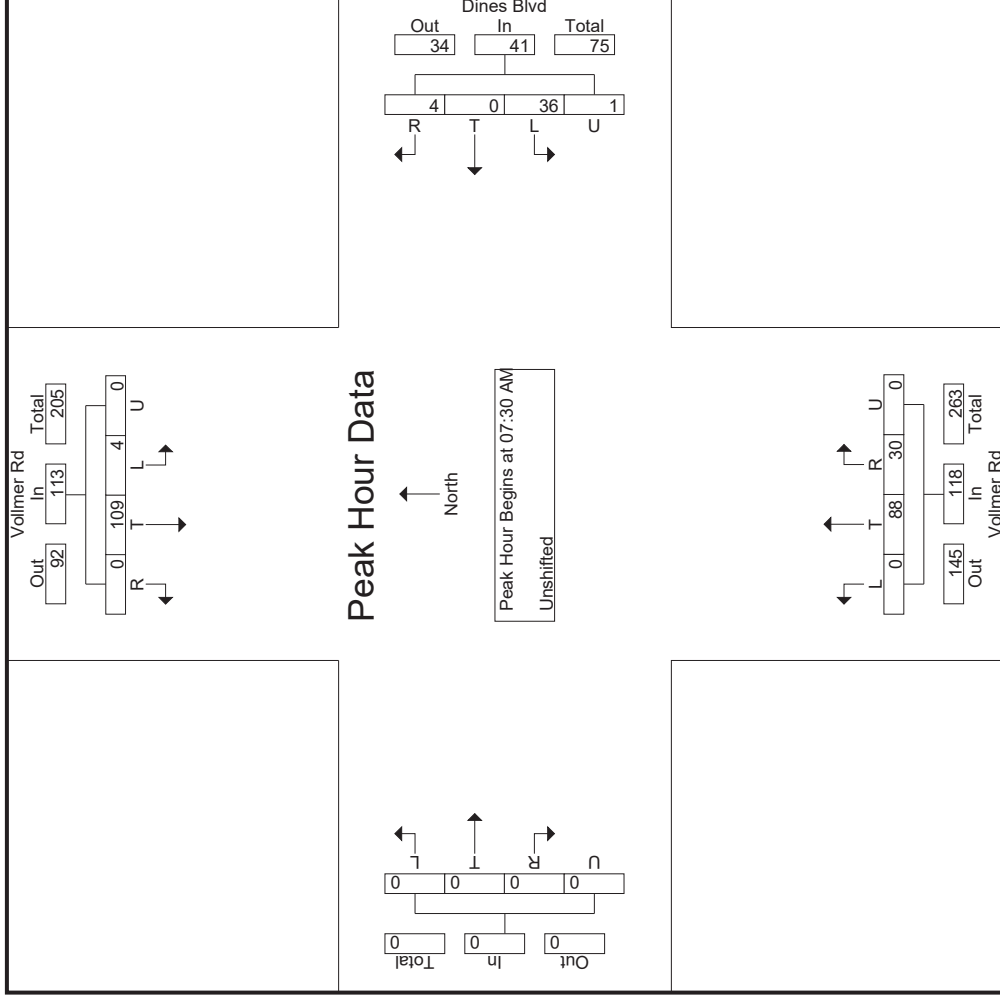


LSC Transportation Consultants, Inc.
 545 E Pikes Peak Ave, Suite 210
 Colorado Springs, CO 80905
 719-633-2868

File Name : Vollmer Rd - Dines Blvd AM
 Site Code : 00204380
 Start Date : 5/27/2020
 Page No : 1

Groups Printed- Unshifted

Start Time	Vollmer Rd Southbound						Dines Blvd Westbound						Vollmer Rd Northbound						Eastbound					
	L	T	R	U	App. Total		L	T	R	U	App. Total		L	T	R	U	App. Total		L	T	R	U	App. Total	
06:30 AM	1	30	0	0	31		2	0	1	0	3		0	4	3	0	7		0	0	0	0	0	
06:45 AM	1	28	0	0	29		3	0	2	0	5		0	11	2	0	13		0	0	0	0	0	
Total	2	58	0	0	60		5	0	3	0	8		0	15	5	0	20		0	0	0	0	0	0
07:00 AM	1	24	0	0	25		8	0	3	0	11		0	19	3	0	22		0	0	0	0	0	
07:15 AM	1	29	0	0	30		4	0	0	0	4		0	26	5	0	31		0	0	0	0	0	
07:30 AM	0	27	0	0	27		9	0	1	0	10		0	21	8	0	29		0	0	0	0	0	
07:45 AM	0	33	0	0	33		8	0	3	1	12		0	21	6	0	27		0	0	0	0	0	
Total	2	113	0	0	115		29	0	7	1	37		0	87	22	0	109		0	0	0	0	0	0
08:00 AM	1	25	0	0	26		7	0	0	0	7		0	23	6	0	29		0	0	0	0	0	
08:15 AM	3	24	0	0	27		12	0	0	0	12		0	23	10	0	33		0	0	0	0	0	
Grand Total	8	220	0	0	228		53	0	10	1	64		0	148	43	0	191		0	0	0	0	0	0
Apprch %	3.5	96.5	0	0		82.8	0	15.6	1.6				0	77.5	22.5	0		0	0	0	0	0		
Total %	1.7	45.5	0	0	47.2		11	0	2.1	0.2	13.3		0	30.6	8.9	0	39.5		0	0	0	0	0	0

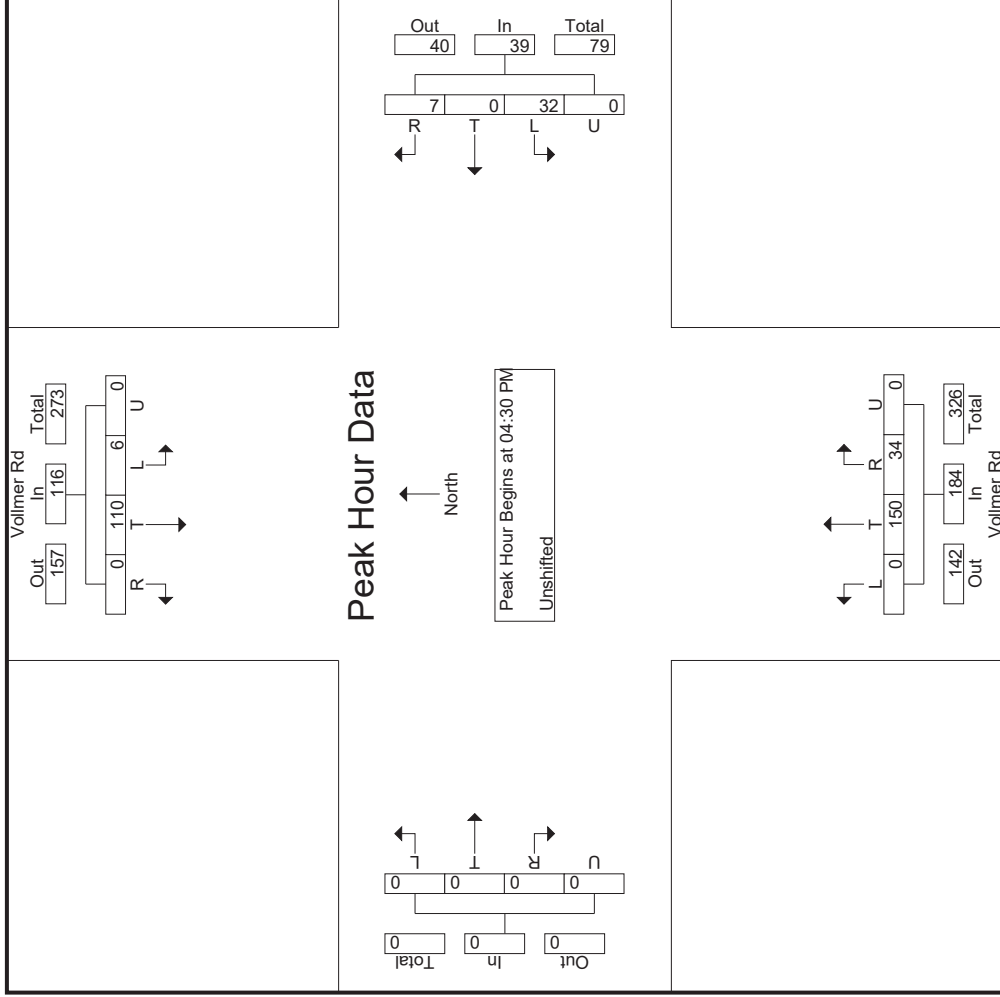


LSC Transportation Consultants, Inc.
 545 E Pikes Peak Ave, Suite 210
 Colorado Springs, CO 80905
 719-633-2868

File Name : Vollmer Rd - Dines Blvd PM
 Site Code : 00204380
 Start Date : 5/27/2020
 Page No : 1

Groups Printed- Unshifted

Start Time	Vollmer Rd Southbound					Vollmer Rd Northbound					Vollmer Rd Eastbound								
	L		R		U	L		R		U	L		R		U				
		T		T	App. Total		T		T	App. Total		T		T	App. Total	Int. Total			
04:00 PM	0	21	0	0	21	6	0	0	0	6	0	39	8	0	47	0	0	0	74
04:15 PM	1	29	0	0	30	9	0	1	1	11	0	30	9	0	39	0	0	0	80
04:30 PM	3	28	0	0	31	8	0	3	0	11	0	50	11	0	61	0	0	0	103
04:45 PM	0	23	0	0	23	4	0	0	0	4	0	35	12	0	47	0	0	0	74
Total	4	101	0	0	105	27	0	4	1	32	0	154	40	0	194	0	0	0	331
05:00 PM	2	26	0	0	28	13	0	0	0	13	0	31	4	0	35	0	0	0	76
05:15 PM	1	33	0	0	34	7	0	4	0	11	0	34	7	0	41	0	0	0	86
05:30 PM	1	20	0	0	21	7	0	2	0	9	0	43	13	0	56	0	0	0	86
05:45 PM	0	13	0	0	13	2	0	2	0	4	0	33	8	0	41	0	0	0	58
Total	4	92	0	0	96	29	0	8	0	37	0	141	32	0	173	0	0	0	306
Grand Total	8	193	0	0	201	56	0	12	1	69	0	295	72	0	367	0	0	0	637
Apprch %	4	96	0	0	31.6	81.2	0	17.4	1.4	10.8	0	80.4	19.6	0	57.6	0	0	0	0
Total %	1.3	30.3	0	0	31.6	8.8	0	1.9	0.2	10.8	0	46.3	11.3	0	57.6	0	0	0	0



Levels of Service



Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	10	3	277	3	2	339
Future Vol, veh/h	10	3	277	3	2	339
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	235	-	235	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	4	326	4	2	399

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	729	326	0	0	330	0
Stage 1	326	-	-	-	-	-
Stage 2	403	-	-	-	-	-
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	390	715	-	-	1229	-
Stage 1	731	-	-	-	-	-
Stage 2	675	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	389	715	-	-	1229	-
Mov Cap-2 Maneuver	389	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	674	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT	
Capacity (veh/h)	-	-	389	715	1229	-
HCM Lane V/C Ratio	-	-	0.03	0.005	0.002	-
HCM Control Delay (s)	-	-	14.5	10.1	7.9	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	7	2	416	12	7	314
Future Vol, veh/h	7	2	416	12	7	314
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	235	-	235	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	2	489	14	8	369

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	874	489	0	0	503	0
Stage 1	489	-	-	-	-	-
Stage 2	385	-	-	-	-	-
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	320	579	-	-	1061	-
Stage 1	616	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	317	579	-	-	1061	-
Mov Cap-2 Maneuver	317	-	-	-	-	-
Stage 1	616	-	-	-	-	-
Stage 2	682	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.5	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	317	579	1061	-
HCM Lane V/C Ratio	-	-	0.026	0.004	0.008	-
HCM Control Delay (s)	-	-	16.7	11.2	8.4	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Intersection												
Int Delay, s/veh	7.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖			↔			↔	
Traffic Vol, veh/h	18	0	5	0	0	0	13	0	0	0	0	55
Future Vol, veh/h	18	0	5	0	0	0	13	0	0	0	0	55
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	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	0	6	0	0	0	15	0	0	0	0	65

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	6	0	0	79	46	3	46	49	1
Stage 1	-	-	-	-	-	-	45	45	-	1	1	-
Stage 2	-	-	-	-	-	-	34	1	-	45	48	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1622	-	-	1615	-	0	910	846	1081	955	843	1084
Stage 1	-	-	-	-	-	0	969	857	-	1022	895	-
Stage 2	-	-	-	-	-	0	982	895	-	969	855	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	1615	-	-	847	835	1081	945	832	1084
Mov Cap-2 Maneuver	-	-	-	-	-	-	847	835	-	945	832	-
Stage 1	-	-	-	-	-	-	956	846	-	1009	895	-
Stage 2	-	-	-	-	-	-	923	895	-	956	844	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.7	0	9.3	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	847	1622	-	-	1615	-	1084
HCM Lane V/C Ratio	0.018	0.013	-	-	-	-	0.06
HCM Control Delay (s)	9.3	7.2	-	-	0	-	8.5
HCM Lane LOS	A	A	-	-	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	0.2

Intersection

Int Delay, s/veh 1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	62	6	283	20	3	356
Future Vol, veh/h	62	6	283	20	3	356
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	235	-	235	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	73	7	333	24	4	419

Major/Minor

	Minor1	Major1	Major2		
Conflicting Flow All	760	333	0	0	357
Stage 1	333	-	-	-	-
Stage 2	427	-	-	-	-
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	374	709	-	-	1202
Stage 1	726	-	-	-	-
Stage 2	658	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	373	709	-	-	1202
Mov Cap-2 Maneuver	373	-	-	-	-
Stage 1	726	-	-	-	-
Stage 2	656	-	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	16.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt

	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	373	709	1202	-
HCM Lane V/C Ratio	-	-	0.196	0.01	0.003	-
HCM Control Delay (s)	-	-	17	10.1	8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0	0	-

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	TT		T			T
Traffic Vol, veh/h	17	9	283	6	3	342
Future Vol, veh/h	17	9	283	6	3	342
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	11	333	7	4	402

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	747	337	0	0	340
Stage 1	337	-	-	-	-
Stage 2	410	-	-	-	-
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	381	705	-	-	1219
Stage 1	723	-	-	-	-
Stage 2	670	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	379	705	-	-	1219
Mov Cap-2 Maneuver	379	-	-	-	-
Stage 1	723	-	-	-	-
Stage 2	667	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	451	1219
HCM Lane V/C Ratio	-	-	0.068	0.003
HCM Control Delay (s)	-	-	13.6	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖			↔			↔	
Traffic Vol, veh/h	62	0	19	0	0	0	9	0	0	0	0	36
Future Vol, veh/h	62	0	19	0	0	0	9	0	0	0	0	36
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	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	0	22	0	0	0	11	0	0	0	0	42

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1	0	0	22	0	0	179	158	11	158	169	1
Stage 1	-	-	-	-	-	-	157	157	-	1	1	-
Stage 2	-	-	-	-	-	-	22	1	-	157	168	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1622	-	-	1593	-	0	783	734	1070	808	724	1084
Stage 1	-	-	-	-	-	0	845	768	-	1022	895	-
Stage 2	-	-	-	-	-	0	996	895	-	845	759	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	1593	-	-	727	701	1070	781	691	1084
Mov Cap-2 Maneuver	-	-	-	-	-	-	727	701	-	781	691	-
Stage 1	-	-	-	-	-	-	807	733	-	976	895	-
Stage 2	-	-	-	-	-	-	957	895	-	807	725	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.6	0	10	8.5
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	727	1622	-	-	1593	-	1084
HCM Lane V/C Ratio	0.015	0.045	-	-	-	-	0.039
HCM Control Delay (s)	10	7.3	-	-	0	-	8.5
HCM Lane LOS	B	A	-	-	A	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	0.1

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	41	4	436	71	10	325
Future Vol, veh/h	41	4	436	71	10	325
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	235	-	235	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	5	513	84	12	382

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	919	513	0	0	597
Stage 1	513	-	-	-	-
Stage 2	406	-	-	-	-
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	301	561	-	-	980
Stage 1	601	-	-	-	-
Stage 2	673	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	297	561	-	-	980
Mov Cap-2 Maneuver	297	-	-	-	-
Stage 1	601	-	-	-	-
Stage 2	665	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.8	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	297	561	980	-
HCM Lane V/C Ratio	-	-	0.162	0.008	0.012	-
HCM Control Delay (s)	-	-	19.5	11.5	8.7	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	0	-

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	6	420	20	10	324
Future Vol, veh/h	11	6	420	20	10	324
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	7	494	24	12	381

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	911	506	0	0	518
Stage 1	506	-	-	-	-
Stage 2	405	-	-	-	-
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	304	566	-	-	1048
Stage 1	606	-	-	-	-
Stage 2	673	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	299	566	-	-	1048
Mov Cap-2 Maneuver	299	-	-	-	-
Stage 1	606	-	-	-	-
Stage 2	663	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.6	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	359	1048
HCM Lane V/C Ratio	-	-	0.056	0.011
HCM Control Delay (s)	-	-	15.6	8.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓		↑	↑↓				↑			↑
Traffic Vol, veh/h	0	1001	39	115	1832	1	0	0	67	0	0	0
Future Vol, veh/h	0	1001	39	115	1832	1	0	0	67	0	0	0
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	-	-	-	100	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1054	41	121	1928	1	0	0	71	0	0	0

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	1095	0	0	-	-	548	-	-	965
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	633	-	-	0	0	480	0	0	255
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	633	-	-	-	-	480	-	-	255
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		0.7		13.8		0	
HCM LOS					B		A	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	480	-	-	633	-	-	-
HCM Lane V/C Ratio	0.147	-	-	0.191	-	-	-
HCM Control Delay (s)	13.8	-	-	12	-	-	0
HCM Lane LOS	B	-	-	B	-	-	A
HCM 95th %tile Q(veh)	0.5	-	-	0.7	-	-	-

Timings
8: Vollmer Rd & Briargate Pkwy

2040 Background Traffic
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	824	60	333	1442	57	90	123	124	92	304	125
Future Volume (vph)	55	824	60	333	1442	57	90	123	124	92	304	125
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	53.0	53.0	22.0	65.0	65.0	15.0	30.0	30.0	15.0	30.0	30.0
Total Split (%)	8.3%	44.2%	44.2%	18.3%	54.2%	54.2%	12.5%	25.0%	25.0%	12.5%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	43.6	38.2	38.2	15.2	51.5	51.5	21.9	15.1	15.1	22.2	15.2	15.2
Actuated g/C Ratio	0.46	0.40	0.40	0.16	0.54	0.54	0.23	0.16	0.16	0.23	0.16	0.16
v/c Ratio	0.33	0.61	0.09	0.64	0.79	0.07	0.35	0.23	0.34	0.29	0.57	0.34
Control Delay	16.1	25.4	0.2	47.4	23.6	0.4	32.6	40.8	7.0	31.3	44.5	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	25.4	0.2	47.4	23.6	0.4	32.6	40.8	7.0	31.3	44.5	7.1
LOS	B	C	A	D	C	A	C	D	A	C	D	A
Approach Delay		23.2			27.2			26.1			33.2	
Approach LOS		C			C			C			C	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 95.3
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 27.0
 Intersection LOS: C
 Intersection Capacity Utilization 74.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 8: Vollmer Rd & Briargate Pkwy



Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑↑		↑↑	↑	↑	↑↑
Traffic Vol, veh/h	31	1	227	9	0	490
Future Vol, veh/h	31	1	227	9	0	490
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	155	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	1	239	9	0	516

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	497	120	0	0	248
Stage 1	239	-	-	-	-
Stage 2	258	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	502	909	-	-	1315
Stage 1	778	-	-	-	-
Stage 2	761	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	502	909	-	-	1315
Mov Cap-2 Maneuver	502	-	-	-	-
Stage 1	778	-	-	-	-
Stage 2	761	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	509	1315
HCM Lane V/C Ratio	-	-	0.066	-
HCM Control Delay (s)	-	-	12.6	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓		↑	↑↓				↑			↑
Traffic Vol, veh/h	0	1833	89	127	1601	3	0	0	110	0	0	0
Future Vol, veh/h	0	1833	89	127	1601	3	0	0	110	0	0	0
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	-	-	-	100	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1929	94	134	1685	3	0	0	116	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	2023	0	0	-	-	1012	-	-	844
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	277	-	-	0	0	237	0	0	307
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	277	-	-	-	-	237	-	-	307
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			2.2			33.9			0		
HCM LOS							D			A		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	237	-	-	277	-	-	-
HCM Lane V/C Ratio	0.489	-	-	0.483	-	-	-
HCM Control Delay (s)	33.9	-	-	29.5	-	-	0
HCM Lane LOS	D	-	-	D	-	-	A
HCM 95th %tile Q(veh)	2.5	-	-	2.5	-	-	-

Timings
8: Vollmer Rd & Briargate Pkwy

2040 Background Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	1447	105	319	1195	87	205	396	367	108	213	109
Future Volume (vph)	184	1447	105	319	1195	87	205	396	367	108	213	109
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	20.0	52.0	52.0	27.0	59.0	59.0	21.0	27.0	27.0	14.0	20.0	20.0
Total Split (%)	16.7%	43.3%	43.3%	22.5%	49.2%	49.2%	17.5%	22.5%	22.5%	11.7%	16.7%	16.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	62.0	49.9	49.9	16.3	54.2	54.2	31.9	18.6	18.6	21.4	12.8	12.8
Actuated g/C Ratio	0.55	0.44	0.44	0.14	0.48	0.48	0.28	0.16	0.16	0.19	0.11	0.11
v/c Ratio	0.70	0.95	0.14	0.68	0.74	0.11	0.65	0.70	0.76	0.50	0.56	0.32
Control Delay	33.8	45.8	0.4	53.9	28.5	0.4	43.5	52.0	21.2	40.5	54.3	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	45.8	0.4	53.9	28.5	0.4	43.5	52.0	21.2	40.5	54.3	2.4
LOS	C	D	A	D	C	A	D	D	C	D	D	A
Approach Delay		41.6			32.0			38.4			37.6	
Approach LOS		D			C			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 113.6
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 37.3
 Intersection LOS: D
 Intersection Capacity Utilization 83.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 8: Vollmer Rd & Briargate Pkwy



Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑↑		↑↑	↑	↑	↑↑
Traffic Vol, veh/h	20	0	635	32	1	410
Future Vol, veh/h	20	0	635	32	1	410
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	155	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	0	668	34	1	432

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	886	334	0	0	702
Stage 1	668	-	-	-	-
Stage 2	218	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	284	662	-	-	891
Stage 1	471	-	-	-	-
Stage 2	797	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	284	662	-	-	891
Mov Cap-2 Maneuver	284	-	-	-	-
Stage 1	471	-	-	-	-
Stage 2	796	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	284	891
HCM Lane V/C Ratio	-	-	0.074	0.001
HCM Control Delay (s)	-	-	18.7	9
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓		↑	↑↓				↑			↑
Traffic Vol, veh/h	0	1005	39	115	1832	2	0	0	67	0	0	57
Future Vol, veh/h	0	1005	39	115	1832	2	0	0	67	0	0	57
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	-	-	-	100	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1058	41	121	1928	2	0	0	71	0	0	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1099	0	0	-	-	550	-	-	965
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	631	-	-	0	0	479	0	0	255
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	631	-	-	-	-	479	-	-	255
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.7			13.8			23.4		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	479	-	-	631	-	-	255
HCM Lane V/C Ratio	0.147	-	-	0.192	-	-	0.235
HCM Control Delay (s)	13.8	-	-	12.1	-	-	23.4
HCM Lane LOS	B	-	-	B	-	-	C
HCM 95th %tile Q(veh)	0.5	-	-	0.7	-	-	0.9

Timings
8: Vollmer Rd & Briargate Pkwy

2040 Total Traffic
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	824	60	367	1464	58	90	138	124	96	315	128
Future Volume (vph)	64	824	60	367	1464	58	90	138	124	96	315	128
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	53.0	53.0	22.0	65.0	65.0	15.0	30.0	30.0	15.0	30.0	30.0
Total Split (%)	8.3%	44.2%	44.2%	18.3%	54.2%	54.2%	12.5%	25.0%	25.0%	12.5%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	43.9	38.5	38.5	15.9	52.5	52.5	22.3	15.5	15.5	22.6	15.6	15.6
Actuated g/C Ratio	0.45	0.40	0.40	0.16	0.54	0.54	0.23	0.16	0.16	0.23	0.16	0.16
v/c Ratio	0.39	0.62	0.09	0.69	0.80	0.07	0.35	0.26	0.34	0.30	0.58	0.35
Control Delay	18.1	25.9	0.2	48.8	24.2	0.5	32.9	41.0	6.9	31.7	45.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	25.9	0.2	48.8	24.2	0.5	32.9	41.0	6.9	31.7	45.0	7.4
LOS	B	C	A	D	C	A	C	D	A	C	D	A
Approach Delay		23.8			28.2			26.9			33.7	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 96.7
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 27.8
 Intersection LOS: C
 Intersection Capacity Utilization 75.0%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 8: Vollmer Rd & Briargate Pkwy



Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↘		↑↑	↑	↘	↑↑
Traffic Vol, veh/h	49	4	228	32	2	490
Future Vol, veh/h	49	4	228	32	2	490
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	155	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	4	240	34	2	516

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	502	120	0	0	274
Stage 1	240	-	-	-	-
Stage 2	262	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	499	909	-	-	1286
Stage 1	777	-	-	-	-
Stage 2	758	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	498	909	-	-	1286
Mov Cap-2 Maneuver	498	-	-	-	-
Stage 1	777	-	-	-	-
Stage 2	756	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	516	1286
HCM Lane V/C Ratio	-	-	0.108	0.002
HCM Control Delay (s)	-	-	12.8	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓		↑	↑↓				↑			↑
Traffic Vol, veh/h	0	1836	89	127	1601	8	0	0	110	0	0	38
Future Vol, veh/h	0	1836	89	127	1601	8	0	0	110	0	0	38
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	-	-	-	100	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1933	94	134	1685	8	0	0	116	0	0	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	2027	0	0	-	-	1014	-	-	847
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	276	-	-	0	0	236	0	0	305
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	276	-	-	-	-	236	-	-	305
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			2.2			34.1			18.6		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	236	-	-	276	-	-	305
HCM Lane V/C Ratio	0.491	-	-	0.484	-	-	0.131
HCM Control Delay (s)	34.1	-	-	29.7	-	-	18.6
HCM Lane LOS	D	-	-	D	-	-	C
HCM 95th %tile Q(veh)	2.5	-	-	2.5	-	-	0.4

Timings
8: Vollmer Rd & Briargate Pkwy

2040 Total Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	212	1447	105	342	1209	87	205	447	367	111	220	111
Future Volume (vph)	212	1447	105	342	1209	87	205	447	367	111	220	111
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	20.0	51.0	51.0	28.0	59.0	59.0	21.0	27.0	27.0	14.0	20.0	20.0
Total Split (%)	16.7%	42.5%	42.5%	23.3%	49.2%	49.2%	17.5%	22.5%	22.5%	11.7%	16.7%	16.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	63.5	50.1	50.1	17.4	54.1	54.1	33.5	20.2	20.2	22.9	14.3	14.3
Actuated g/C Ratio	0.55	0.43	0.43	0.15	0.46	0.46	0.29	0.17	0.17	0.20	0.12	0.12
v/c Ratio	0.80	0.97	0.14	0.70	0.77	0.11	0.65	0.75	0.73	0.55	0.54	0.32
Control Delay	46.9	50.6	0.4	54.8	30.8	0.4	43.4	54.1	18.9	43.0	53.5	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	50.6	0.4	54.8	30.8	0.4	43.4	54.1	18.9	43.0	53.5	2.3
LOS	D	D	A	D	C	A	D	D	B	D	D	A
Approach Delay		47.0			34.2			39.1			38.0	
Approach LOS		D			C			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 116.4
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 40.1
 Intersection LOS: D
 Intersection Capacity Utilization 84.9%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 8: Vollmer Rd & Briargate Pkwy



Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	TT		TT	TT	TT	TT
Traffic Vol, veh/h	32	2	636	110	5	410
Future Vol, veh/h	32	2	636	110	5	410
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	155	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	2	669	116	5	432

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	895	335	0	0	785
Stage 1	669	-	-	-	-
Stage 2	226	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	280	661	-	-	829
Stage 1	471	-	-	-	-
Stage 2	790	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	278	661	-	-	829
Mov Cap-2 Maneuver	278	-	-	-	-
Stage 1	471	-	-	-	-
Stage 2	785	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	288	829
HCM Lane V/C Ratio	-	-	0.124	0.006
HCM Control Delay (s)	-	-	19.3	9.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0