



LSC TRANSPORTATION CONSULTANTS, INC.
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MEMORANDUM

DATE: October 16, 2017

TO: Jeff Rice – El Paso County Planning and Community Development

FROM: Jeff Hodsdon - LSC Transportation Consultants, Inc.

SUBJECT: Waterbury Phase 1 Filing Nos. 2 and 3
Response to Comments Memorandum
LSC #174480

Following are the LSC Transportation Consultants, Inc. responses to El Paso County Planning and Community Development department comments regarding the August 3, 2017 Traffic Impact Analysis by LSC.

Page 2: revise to Waterbury

LSC Response: The correction has been made in the updated report.

Page 7: If traffic on both roads increases proportionally, when might warrants be met?

LSC Response: A table showing the anticipated year that the traffic signal warrant thresholds will be met during both the morning and afternoon peak hours has been added to the updated report.

Page 10: Reference Stapleton East Access Permit and IGA conditions (Res. No. 10-119).

LSC Response: These documents have been referenced in the updated report.

Page 10: The design of Eastonville Road is being performed by the Meridian Ranch developer.

LSC Response: This note has been added in the updated report.

Page 11: §923

LSC Response: The report has been updated to reflect the current per-lot up-front building permit fee and the total building permit fee amount has been recalculated.

Page 13: Provide table listing all required improvements.

LSC Response: The requested table has been added to the updated report.

Page 16: Provide link ADT volumes for Stapleton, Eastonville, and Highway 24.

LSC Response: The requested daily traffic volumes have been added to all of the figures in the updated report.

Following are the LSC Transportation Consultants, Inc. responses to the Colorado Department of Transportation comments regarding the August 3, 2017 Traffic Impact Analysis by LSC.

I am in receipt of a referral request for comment on the subject planning referral. The Department understands the developer plans to increase the development from 67 to 72 individual family lots. The development is located in a portion of sections 28, 29 and 33 all in township 12 south, range 64W of the 6th PM, generally northwest of the intersection of Stapleton Drive and State Highway 24. CDOT's comments are as follows;

- The Department requests that the LSC Transportation Consultants, Inc. Traffic Study dated June 6th 2013 for Access Permit 213090 be updated to reflect the proposed development.*

LSC Response: Note: No changes are proposed to Waterbury Filing 1, the platted 67 lots within Filing No. 1, or the accompanying Filing 1 Access Permit No. 213090. The currently proposed 72 lots are actually proposed as the next subdivision filing within Phase 1 of the Waterbury development. The traffic study for Filing 1 is still applicable. A new access permit will be needed for Filing No. 2 and the proposed 57 lots in Filing No. 3. This permit application will be submitted to CDOT. Please refer to the site-specific traffic report for Filings 2 and 3. The latest version is dated October 16, 2017.



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Waterbury Phase 1 Filing Nos. 2 and 3 Updated Traffic Impact Analysis (LSC #174480) October 16, 2017

Traffic Engineer's Statement

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


Jeffrey C. Hodsdon, P.E., #31684




Date

Developer's Statement

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


Peter R. Mantz


Date



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October 16, 2017

Mr. Peter Martz
4 Way Ranch Joint Venture
P.O. Box 50223
Colorado Springs, Colorado 80949

RE: Waterbury Phase 1 Filing Nos. 2 and 3
El Paso County, Colorado
Updated Traffic Impact Analysis
LSC #174480

Dear Mr. Martz:

LSC Transportation Consultants, Inc. has prepared this updated traffic impact study for the proposed Waterbury (Phase 1) Filing Nos. 2 and 3. The overall Waterbury PUD Development Plan was previously studied in a traffic impact study by LSC dated January 10, 2013, and a traffic study for the 196-lot Phase 1 Preliminary Plan was dated June 5, 2013 with a report supplement dated July 10, 2013. A traffic study for the 67-lot Waterbury Filing No. 1 was completed by LSC on January 6, 2014.

The currently proposed 72 lots in Filing No. 2 and 57 lots in Filing No. 3 would complete Preliminary Plan No. 1 (Phase 1). The site is located generally north of Stapleton Drive and east of Eastonville Road in El Paso County, Colorado as shown on Figure 1. **The site plan for this final plat is in conformance with the Preliminary Plan.**

REPORT CONTENTS

This report is being prepared as part of a submittal to El Paso County. It identifies the traffic impacts of the Waterbury Filings Nos. 2 and 3. The report contains the following:

- The traffic count data and street conditions.
- Short-term baseline/background traffic volume estimates.
- The projected average weekday and peak-hour vehicle-trips to be generated by the site.
- The assignment of the site's projected traffic volumes to the key area streets and intersections for the short term and the resulting total traffic volumes for the short term.
- The resulting traffic impacts including level of service analysis at key intersections.
- Short-term traffic signal warrant analysis at key intersections.
- The recommended street classifications for the internal streets within the proposed development.
- Short-term roadway improvement recommendations.
- The project's obligation (if any) to the County roadway improvement fee program.

LAND USE AND ACCESS

Figure 2 shows the location of the entire Waterbury PUD development as well as the location of Phase 1, which includes the approved Filing No. 1 and the currently proposed Filing Nos. 2 and 3. The approved Filing 1 includes lots for 67 single-family homes, which is the same number of lots as was assumed in the 2014 traffic study for that filing. The currently proposed Filing Nos. 2 and 3 are planned to include 129 lots for single-family homes (72 lots in Filing No. 2 and 57 lots in Filing No. 3). This will result in a total of 196 lots for single-family homes in Phase 1, which is the same number of lots as was assumed in the 2013 traffic study for the Phase 1 Preliminary Plan. Access for these filings will be to the new full-movement intersection (Saybrook Drive) on Stapleton Road east of Bandanero Drive as previously approved.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

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

- **Eastonville Road** is a two-lane roadway extending northeast from Meridian Road to past Hodgen Road. The Eastonville Road cross section south of Stapleton Drive is consistent with a two-lane Urban Collector cross section. The cross section of Eastonville Road north of Stapleton Drive is to be determined, but has been identified in the 2016 *El Paso County Major Transportation Corridors Plan (MTCP)* update as a two-lane Rural Minor Arterial.
- **Stapleton Drive** is shown as a four-lane Principal Arterial on the El Paso County MTCP and El Paso County Corridor Preservation Plan (CPP). Stapleton Drive extends east from Towner Drive to US Highway (US) 24. Stapleton continues southeast, then south as Curtis Road. It is planned to ultimately be extended west to connect with the Briargate Parkway extension. Stapleton Drive currently has one through lane in each direction adjacent to the site and through the Eastonville Road intersection and the US 24 intersection.
- **Londonderry Drive** is a two-lane Urban Residential Collector extending east from the Falcon Hills neighborhood to Eastonville Road. East of Meridian Road within the Meridian Ranch development, Londonderry Drive has one through lane in each direction and a raised, landscaped center median with left-turn lanes. The posted speed limit is 35 miles per hour (mph)
- **US Highway 24** is a two-lane east/west State Highway extending locally from the City of Colorado Springs to Peyton in a northeasterly direction and then continuing east. US 24 is classified as an Expressway by CDOT in the vicinity of the site and is shown as an Expressway on the MTCP. US 24 is shown on the transportation plans as a future four-lane facility in the vicinity of the site. CDOT is currently conducting a Planning and Environmental Linkage (PEL) study. The posted speed limit on US 24 is 65 miles per hour (mph) in the vicinity of Stapleton.

Existing Traffic Volumes

Figure 3 shows the existing traffic volumes at key intersections along Stapleton Drive and Eastonville Road. These volumes are based on manual intersection turning movement counts conducted by LSC in 2016 and 2017. The traffic counts at Eastonville/Londonderry, which were conducted in January 2016, and the traffic counts at US 24/Stapleton have been adjusted (balanced) based on counts conducted at the intersection of Eastonville/Stapleton conducted in May 2017. The count data sheets are attached for reference.

Existing Levels of Service

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

Table 1 Intersection Levels of Service Delay Ranges			
Level of Service	Signalized Intersections		Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	V/C⁽¹⁾	Average Control Delay (seconds per vehicle)⁽²⁾
A	10.0 sec or less	less than 0.60	10.0 sec or less
B	10.1-20.0 sec	0.60-0.69	10.1-15.0 sec
C	20.1-35.0 sec	0.70-0.79	15.1-25.0 sec
D	35.1-55.0 sec	0.80-0.89	25.1-35.0 sec
E	55.1-80.0 sec	0.90-0.99	35.1-50.0 sec
F	80.1 sec or more	1.00 and greater	50.1 sec or more
(1) Source: <i>Transportation Research Circular 212</i>			
(2) 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.			

Figure 3 presents the results of the existing intersection level of service analysis. Levels of service are based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 2010 Edition* by the Transportation Research Board. The level of service reports are attached.

- The eastbound left-turn movement at the intersection of Londonderry/Eastonville is currently operating at LOS E during the morning peak hour.
- The eastbound approach at the intersection of Stapleton/Eastonville is currently operating at LOS F during the morning (school) peak hour.

- All movements at the intersection of Londonderry/Eastonville and Londonderry/Stapleton are operating at LOS B or better during the afternoon peak hour.
- The operation at these intersections is greatly impacted by traffic to and from the nearby Falcon High School.
- The southbound left turn and northbound left-turn and through movements at the intersection of Stapleton/US 24 are currently operating at a LOS F during the afternoon peak hour.

SHORT-TERM BACKGROUND TRAFFIC

Figure 4 shows the projected background traffic volumes for the short term (2020). These background traffic volumes have been based on the existing traffic volumes (from Figure 3) plus buildout of Waterbury Filing No. 1 (previously approved), Meridian Ranch Filings 1-3 and Filings 6-8, Meridian Ranch Estates Filings 2-3, Meridian Ranch Filing 11, Stonebridge Filings 1, 2, and 3, Meridian Ranch Filing 9, and the Vistas at Meridian Ranch Filing 1.

Background traffic assumes no traffic generated by homes within Waterbury Filing Nos. 2 and 3 (site traffic). The background through traffic volumes on US 24 are based a growth rate calculated from the Colorado Department of Transportation twenty-year growth factor for this section of US 24.

TRIP GENERATION

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 9th Edition, 2012* by the Institute of Transportation Engineers (ITE). Table 2 shows the trip generation estimates for Waterbury Filing Nos. 2 and 3.

Waterbury Filings Nos. 2 and 3 are expected to generate about 1,228 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 24 vehicles would enter and 73 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 81 vehicles would enter and 48 vehicles would exit the site.

DIRECTIONAL DISTRIBUTION

The directional distribution of the site-generated traffic volumes on the area roadways is an important factor in determining the site's traffic impacts. Figure 5 shows the short-term external directional distribution estimates for the site-generated traffic volumes. The estimates have been based on the distribution shown in the Preliminary Plan traffic report.

SITE-GENERATED TRAFFIC

Figure 6 shows the projected short-term site-generated traffic volumes. The site-generated traffic volumes were calculated by applying the directional distribution percentages (from Figure 5) to the trip generation estimates from Table 2.

SHORT-TERM TOTAL TRAFFIC

Figure 7 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 short-term site-generated traffic volumes from Figure 6.

LONG-TERM TRAFFIC

The long-term traffic impacts of Filings 2 and 3 were addressed in the January 10, 2013 Waterbury PUD Development Plan traffic impact analysis which included the long-term traffic volume projections and level of service analysis. The current number of lots and street layout are consistent with the PUD and Preliminary Plan.

PROJECTED LEVELS OF SERVICE

The key intersections on Stapleton Drive and Eastonville Road have been analyzed to determine the projected short-term future levels of service for the short-term background and total traffic volumes based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 2010 Edition* by the Transportation Research Board and Synchro signalized intersection procedures. Figures 4 and 7 show the level of service analysis results. The laneage and traffic control assumed in the analysis is depicted on the figures. The level of service reports are attached. The following is a summary by intersection.

Stapleton/Eastonville

The eastbound approach at the intersection of Stapleton/Eastonville is currently operating at LOS F during the morning peak hour. The LOS F is largely due to the sharp peak of high school traffic and will likely only occur during the peak 15-minute period of the high school (7:15 to 7:30 a.m.). A PPRTA project is currently planned to improve Eastonville Road in the vicinity of the site, however the timing of this project is unknown. Figures 4 and 7 show the projected level of service based on the 2020 background traffic volumes and 2020 total traffic volumes assuming both the existing laneage and the laneage assumed following completion of the PPRTA project (with the addition of northbound and southbound auxiliary turn lanes). The eastbound approach at the intersection of Stapleton/Eastonville is projected to operate at LOS F during the morning and afternoon peak hours based on both 2020 background and total traffic with or without the PPRTA improvements. The westbound left-turn and through movements are projected to operate at LOS F during the morning peak hour and LOS E during the afternoon peak hour. It is not uncommon for the minor approach volumes to operate at LOS E or LOS F during the peak hours as the volumes approach the thresholds for a traffic signal warrant. This intersection is planned to be signalized in the future, however a traffic signal warrant may not be met in the short term. Once signalized, all movements at this intersection are projected to operate at a level of service D or better.

Londonderry/Eastonville

The eastbound left-turn movement at the stop-sign-controlled intersection of Londonderry/Eastonville is projected to operate at a LOS F during the morning peak hour based on the projected short-term background and total morning peak-hour traffic volumes. The LOS F is due to the sharp peak of high school traffic and will likely only occur during the peak 15-minute period of the high school (7:15 to 7:30 a.m.). This turning movement is light and as such, although this intersection is planned to be signalized in the future, it is unlikely that a traffic signal warrant would be met at this intersection in the short term.

Stapleton/Saybrook

All movements at the full-movement site access to Stapleton Drive (Saybrook Drive) are projected to operate at a LOS C or better during the peak hours based on the projected short-term total traffic volumes.

Stapleton/US 24

The southbound left-turn and northbound left-turn and through movements at the intersection of Stapleton/US 24 are currently operating at a LOS F during the afternoon peak hour. By 2020, these movements are projected to continue to operate at LOS F during the morning and afternoon peak hours based on the background and total traffic volumes. Once signalized, all movements are projected to operate at LOS D or better during the peak hours.

TRAFFIC SIGNAL WARRANT ANALYSIS

The intersections of Eastonville/Londonderry, Eastonville/Stapleton and Stapleton/US 24 were analyzed to determine if a Four-Hour Vehicular Volume Traffic Signal Warrant combination-of-volumes thresholds would be met or close to being met based on the projected short-term total peak-hour traffic volumes. This analysis using the peak hours is intended to provide an indication that a warrant may be met or is close to being met. In order for a Four-Hour Traffic Signal Warrant to be satisfied, the volume threshold would need to be met for both the morning and afternoon peak hours plus two additional hours of the day. For example, the four-hour warrant would be satisfied with the volume thresholds met for one hour in the morning, two hours (instead of the one-hour peak) during the afternoon peak period, and an hour during the mid-afternoon school peak.

Figure 8 shows the signal warrant analysis for the intersection of Eastonville/Londonderry. The analysis assumes the minor approach includes all of the eastbound left-turn movements and 50 percent of the eastbound right-turn movements. The analysis assumes a one-lane minor approach as the vast majority of the traffic is projected to use the right lane. The projected short-term total traffic volumes are projected to meet the thresholds during the morning peak hour but not the afternoon peak hour.

Figure 9 shows the signal warrant analysis for the intersection of Eastonville/Stapleton. The analysis for the east leg assumes the minor approach includes all of the westbound left-turn and through movements and none of the westbound right-turn movements. The analysis for the west leg assumes all of the eastbound left, through, and right movements. The projected short-term total traffic volumes are projected to meet the threshold for only the morning peak hour. Table 3 shows an estimate of when the

thresholds would be met based on the projected afternoon peak-hour traffic volumes assuming straight line growth between the short-term total traffic volumes shown in Figure 7 and the 2035 total traffic volumes shown in the January 10, 2013 *Waterbury PUD Development Plan Updated Traffic Impact Study*. As shown on Table 3 the thresholds for a Four-Hour Vehicular Warrant are projected to be met during the afternoon peak hour by the year 2022. In order for a Four-Hour Traffic Signal Warrant to be satisfied, the volume threshold would need to be met for both the morning and afternoon peak hours plus two additional hours of the day. For example, the four-hour warrant would be satisfied with the volume thresholds met for one hour in the morning, two hours (instead of the one-hour peak) during the afternoon peak period, and an hour during the mid-afternoon school peak.

Figure 10 shows the signal warrant analysis for the intersection of Stapleton/US 24 based on the **existing** traffic volumes. The analysis assumes the minor approach includes the southbound left-turn and through movements or the northbound left-turn and through movements. This intersection currently meets the thresholds for a Four-Hour Vehicular Volume Traffic Signal Warrant during both the morning and the afternoon peak hours volumes. Figure 11 presents an alternate analysis with the eastbound left turn as the minor street approach and the westbound through/left traffic volume as the major street volume.

STREET CLASSIFICATIONS

All streets within Waterbury Phase 1 Filing Nos. 2 and 3 should be classified as Urban Local.

PUD DEVELOPMENT PLAN CONDITIONS OF APPROVAL

The following is a list of the previous Waterbury conditions of approval. Table 4 shows the cost estimate and amount of money to be escrowed for each improvement. Each condition is represented by a line item or two in the table. The condition reference letters “a” through “g” are shown in the first column of the table.

a. US 24/Stapleton Drive: Additional design, construction, and/or deposit of funds for US 24/Stapleton Drive intersection per CDOT access permit conditions.

Based on the previous formula for calculation of the signal escrow for Filing 1, the Waterbury Filing Nos. 2 and 3 fair share contribution/escrow amount toward a future signal at this intersection would be \$15,586. This is based on a signal cost of \$350,000.

b. US 24/Judge Orr Road: Additional design, construction, and/or deposit of funds for US 24/Judge Orr Road inter-section per CDOT access permit conditions.

CDOT previously indicated that this project would not be required to complete any improvements or escrow any funds for future improvements at this intersection.

c. Eastonville Road/Stapleton Drive: Additional design, construction, and/or deposit of funds for Eastonville Road/Stapleton Drive intersection improvements and traffic signals, if warranted.

The traffic signal warrant analysis indicates that a signal would not likely be warranted in the short term. The westbound half-section of Stapleton Drive has been constructed. The westbound left-turn lane,

which has already been constructed as part of the northern half-section of Stapleton, will be able to be placed into service with the completion of the southern (eastbound) half of the intersection. The future construction of the eastbound left-turn lane will be completed with the south (eastbound) half of the intersection. The northbound and southbound auxiliary turn lanes will likely be constructed as part of the Eastonville PPRTA project. Table 4 shows the calculated percentage toward a future traffic signal at this intersection.

d. Eastonville Road: Construction, contribution, and/or escrow of funds for final grading and asphalt paving from Latigo Boulevard to Stapleton Drive.

Filings 2 and 3 will add minimal traffic to Eastonville Road. Some site trips will travel between schools in Meridian Ranch and the site. Eastonville is a planned PPRTA project. The improvements will be constructed by the county as part of the PPRTA project. However, the exact scope and timing of the PPRTA project is unknown.

e. Stapleton Drive/Bandanero: Design and construction of intersection reconfiguration improvements at Stapleton Drive/Bandanero intersection.

As with Filing No. 1, LSC recommends that intersection reconfiguration improvements at Stapleton/Bandanero be deferred until traffic volumes on Stapleton increase to the point where restriction of the intersection to three-quarter movement or right-in/right-out become necessary. Currently, traffic volumes on Stapleton are sufficiently light to allow this intersection to remain unchanged. The need for reconfiguration of this intersection could be evaluated with future final plat applications and/or preliminary plans. Table 4 shows the percentage contribution by Filings 2 and 3 toward these improvements.

f. Stapleton Drive/Dumont Drive: Design and construction of intersection reconfiguration improvements at Stapleton Drive/Dumont Drive intersection.

Improvements at Stapleton Drive/Dumont Drive will be completed later—either with 4 Way Ranch commercial development or future Waterbury Preliminary Plans—showing the completion of Dumont north of Stapleton and the connection to Stapleton on the north side.

g. Stapleton Drive: Design, construction, contribution, and/or escrow of funds for the second two lanes of Stapleton Drive from Eastonville Road to Highway 24.

Stapleton Drive expansion to four lanes would not be necessary with the currently proposed filings or overall PUD site-generated traffic alone. The expansion to four lanes would be needed with significant additional background traffic. There is an intergovernmental agreement in place which documents the responsibility of the 4 Way Ranch Metro District for the second two lanes of Stapleton Drive. This IGA essentially functions like a SIA. Table 4 presents the calculated percentage contribution for Filings 2 and 3 toward the future Stapleton improvements.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- The proposed Filing Nos. 2 and 3 are in conformance with the Phase 1 (first) Preliminary Plan. For reference purposes, the trip generation and site-generated traffic volumes specific to this plat have been included in this report.
- The site is expected to generate about 1,228 vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour about 24 vehicles would enter and 73 vehicles would exit the site. During the afternoon peak hour about 81 vehicles would enter and 48 vehicles would exit the site.

Deviations

- A deviation was approved by El Paso County July 16, 2013 for the turn bay lengths on Saybrook on the southbound approach to Stapleton.

State Highway Access Permit

- Colorado State Highway Access Permit Number 213090 allows for access for Waterbury Filing No. 1. A new access permit will be required for Filing Nos. 2 and 3. This report will be submitted to CDOT along with an access permit application form. Based on prior calculations, CDOT would require a \$15,586 signal escrow based on the formula utilized in the last permit and a current signal cost of \$350,000.
- Note: Also applicable are the Stapleton East Access Permit and intergovernmental agreement (IGA) conditions (Res. No 10-119).

County Road Auxiliary Turn Lane Recommendations

A list of all improvements in the vicinity is presented in Table 5.

- Based on projected short-term total volumes and the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)*, an eastbound left-turn lane would be required on Stapleton Drive approaching Saybrook. This lane should be 235 feet long plus a 200-foot taper. A deviation was approved to defer construction of this lane with Filing No. 1, however it will be necessary to construct this lane with the currently proposed Filing Nos. 2 and 3.
- Based on projected short-term total traffic volumes and the criteria contained in the ECM, a westbound right-turn deceleration lane would be required on Stapleton Drive approaching Saybrook. This lane should be 235 feet long plus a 200-foot taper.
- Based on the existing traffic volumes and the criteria contained in the ECM, a southbound left-turn lane is currently warranted on Eastonville Road approaching Stapleton Drive. Improvements to

Eastonville Road will be designed by the Meridian Ranch developer and constructed by El Paso County as a PPRTA project.

- Based on the existing traffic volumes and the criteria contained in the ECM, an eastbound left-turn lane is currently warranted on Stapleton Drive approaching Eastonville Road and a westbound left-turn lane is very close to being warranted. However, these approaches are currently stop-sign controlled. The westbound left-turn lane, which has already been constructed as part of the northern half-section of Stapleton, will be able to be placed into service with the completion of the southern (eastbound) half of the intersection. The future construction of the eastbound left-turn lane will be completed with the south (eastbound) half of the intersection.

PUD Development Plan Conditions of Approval

- This report addresses the transportation impacts of these filings relative to the conditions of approval of the overall PUD Development Plan. The conditions are addressed in an itemized fashion in the above section of this report. Please refer to Table 4 for details.

Transportation Improvement Fee Program


- Filings 2 and 3 will be required to participate in the Countywide Transportation Improvement Fee Program. This project will annex into the 10 mil PID. Based on a per-lot up-front building permit fee of \$923 per dwelling unit, the total building permit fee amount for the 129 lots (both filings) would be \$119,067.

* * * * *

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

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

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

JCH:KDF:bjwb

Enclosures: Tables 2-5
Figures 1-11
Traffic Count Reports
Level of Service Reports

Table 2 Waterbury Preliminary Plan Phase 1 Filing Nos. 2 and 3 Trip Generation Estimate													
Filing	ITE Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾					Total Trips Generated				
				Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
					In	Out	In	Out		In	Out	In	Out
Previously Approved													
1	210	Single-Family Detached Housing	67 DU ⁽²⁾	9.52	0.19	0.56	0.63	0.37	638	13	38	42	25
Currently Proposed													
2	210	Single-Family Detached Housing	72 DU	9.52	0.19	0.56	0.63	0.37	685	14	41	45	27
3	210	Single-Family Detached Housing	57 DU	9.52	0.19	0.56	0.63	0.37	543	11	32	36	21
Total Filing Nos. 2 & 3			129 DU						1,228	24	73	81	48
Total Filing Nos. 1, 2 & 3			196 DU						1,866	37	110	123	73
Notes:													
(1) Source: "Trip Generation, 9th Edition, 2012" by the Institute of Transportation Engineers (ITE)													
(2) DU = dwelling units													
Source: LSC Transportation Consultants, Inc.													

(1) Source: "Trip Generation, 9th Edition, 2012" by the Institute of Transportation Engineers (ITE)

(2) DU = dwelling units

Source: LSC Transportation Consultants, Inc.

Table 3
Waterbury Phase 1 Filing Nos. 2 and 3
Traffic Signal Warrant Analysis of Eastonville/Stapleton
PM Peak-Hour Four-Hour Vehicular Volume Evaluation

Year	PM Peak-Hour Traffic Volumes			Warrant 2, Four-Hour Vehicular Volume Evaluation ⁽¹⁾		
	Major ⁽²⁾	Minor		Minor Street Minimum	EB Met?	WB Met?
		EB ⁽³⁾	WB ⁽⁴⁾			
2020	548	152	184	241	No	No
2021	584	167	212	226	No	No
2022	620	182	239	212	No	Yes
2035	1087	375	600	83	Yes	Yes

Notes:

(1) Based on 1 lane on major approach and 1 lane on minor approach.

(2) The major street volumes include all (left/through/right) movements on Eastonville Road.

(3) The EB minor street volumes includes all easbound movement (left, through and right) on Stapleton Drive.

(4) The WB minor street volumes includes only the left and through westbound movements on Stapleton Dr. The right-turn movements have been excluded because there is an existing exclusive right-turn lane on this approach.

Source: LSC Transportation Consultants, Inc.

Table 4
Waterbury Phase 1 Filing Nos. 2 and 3
Waterbury Cost Estimate for Conditions of Approval

[illegible]

Table 5
Waterbury Phase 1 Filing Nos. 2 and 3
Recommended Improvements

Intersection	Auxilliary Turn Lane	Lane Length (ft)	Taper Length (ft)	Timing When Warranted	Responsibility
Stapleton/Staybrook	Eastbound Left-Turn Lane	235	200	With Filings Nos. 2 & 3	Waterbury
	Westbound Right-Turn Deceleration Lane	235	200	With Filing No. 1	Waterbury
Stapleton/Eastonville	Southbound Left-Turn Lane	TBD w/ design	TBD w/ design	Existing deficiency	Meridian Ranch/El Paso County ⁽¹⁾
	Westbound Left-Turn Lane	Already constructed ⁽²⁾		Short-term	With completion of the southern (eastbound) half of Stapleton Drive. The 4 Way Ranch Metro District is responsible for future completion of Stapleton east of Eastonville.
	Eastbound Left-Turn Lane	TBD	TBD	Existing deficiency ⁽³⁾	

Notes:

- (1) The design of Eastonville Road is being performed by the Meridian Ranch developer. The projected will be constructed by El Paso County as PPRTA project.
- (2) The westbound left-turn lane has already been constructed as part of the northern half-section of Stapleton Dr. It will be able to be placed into service with the completion of the southern (eastbound) half of the roadway.
- (3) The eastbound left-turn lane will be constructed with the completion of the southern (eastbound) half of the Stapleton Dr.

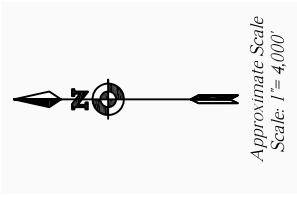


Figure 1
Vicinity
Map

Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)

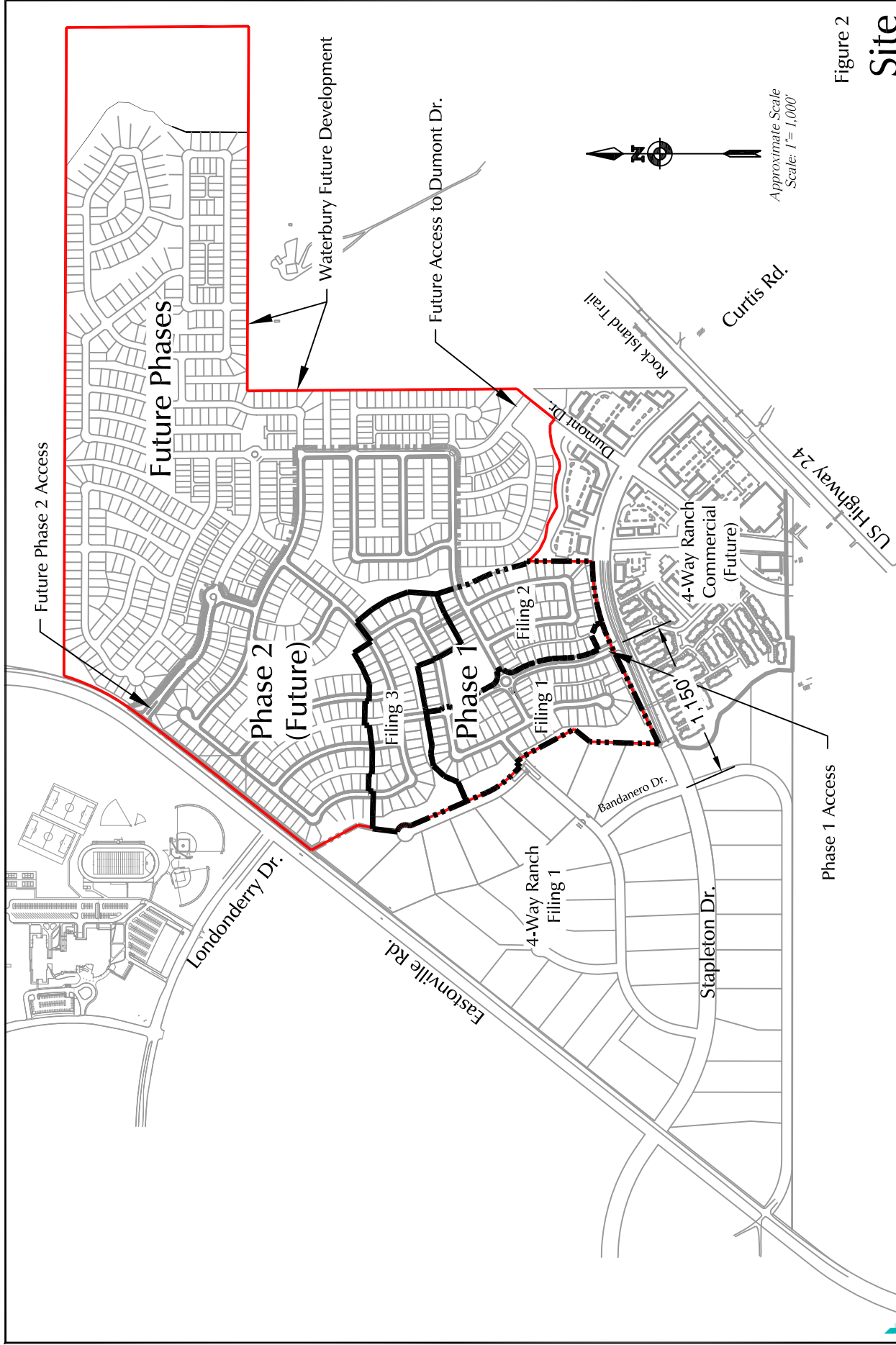
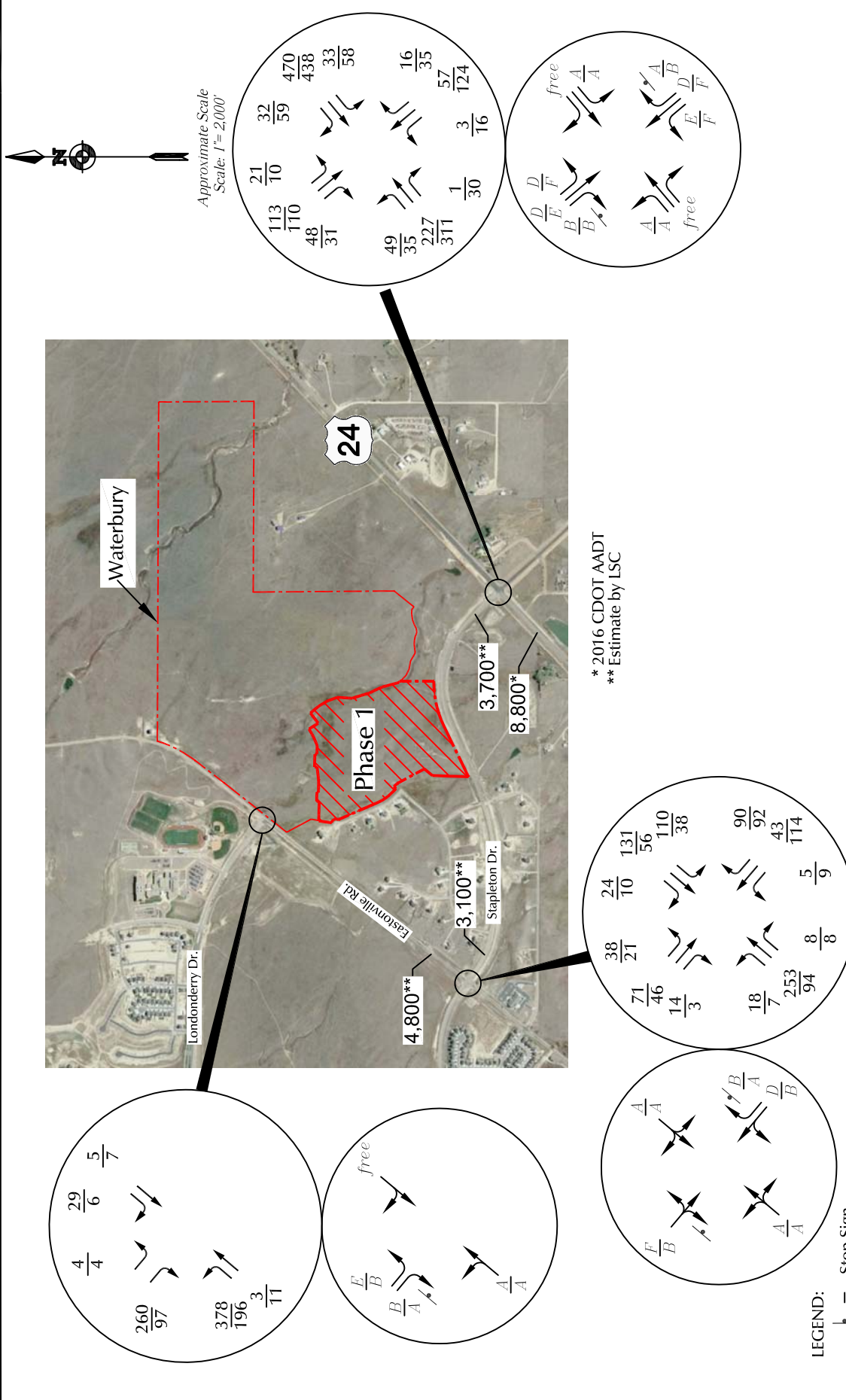


Figure 2

Site Plan

Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)



LEGEND:

- Stop Sign
- AM Weekday Peak-Hour (6:45 to 7:45 AM) Traffic (vehicles per hour)
- PM Weekday Peak-Hour Traffic (vehicles per hour)
- AM Individual Movement Peak-Hour Level of Service
- PM Individual Movement Peak-Hour Level of Service
- X,XXX= Annual Average Daily Traffic (vehicles per day)

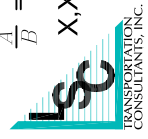
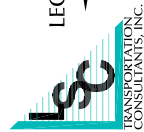


Figure 3
Existing Traffic,
Lane Geometry and Traffic Control
Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)

Based on counts by LSC Jan. 2016, March 2017, May 2017 & June 2017.



Approximate Scale
Scale: 1" = 400'

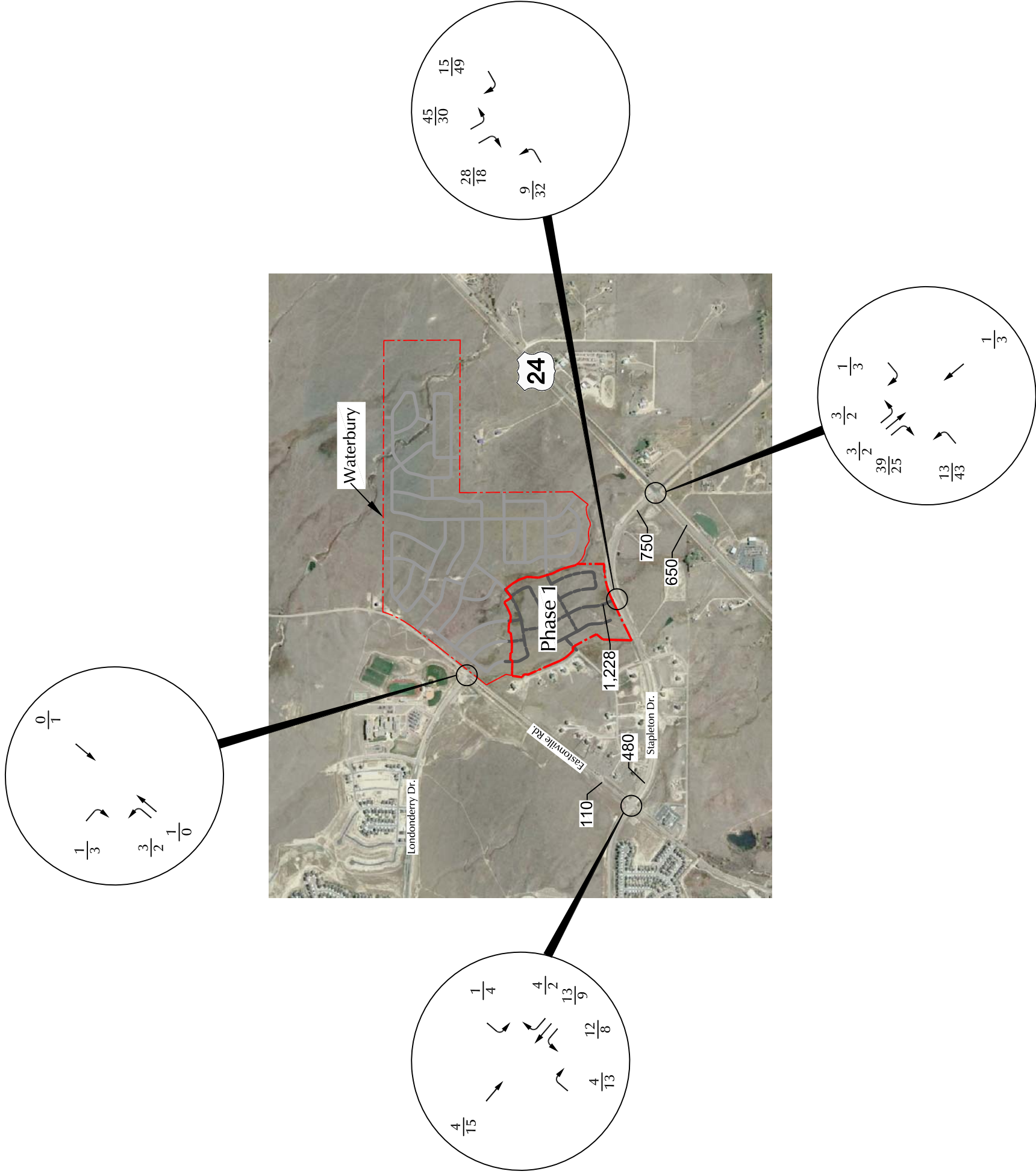


LEGEND:
XX% = Percent Directional Distribution

Figure 5

Directional Distribution of Site-Generated Traffic

Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)



Approximate Scale
Scale: 1"= 2,000'

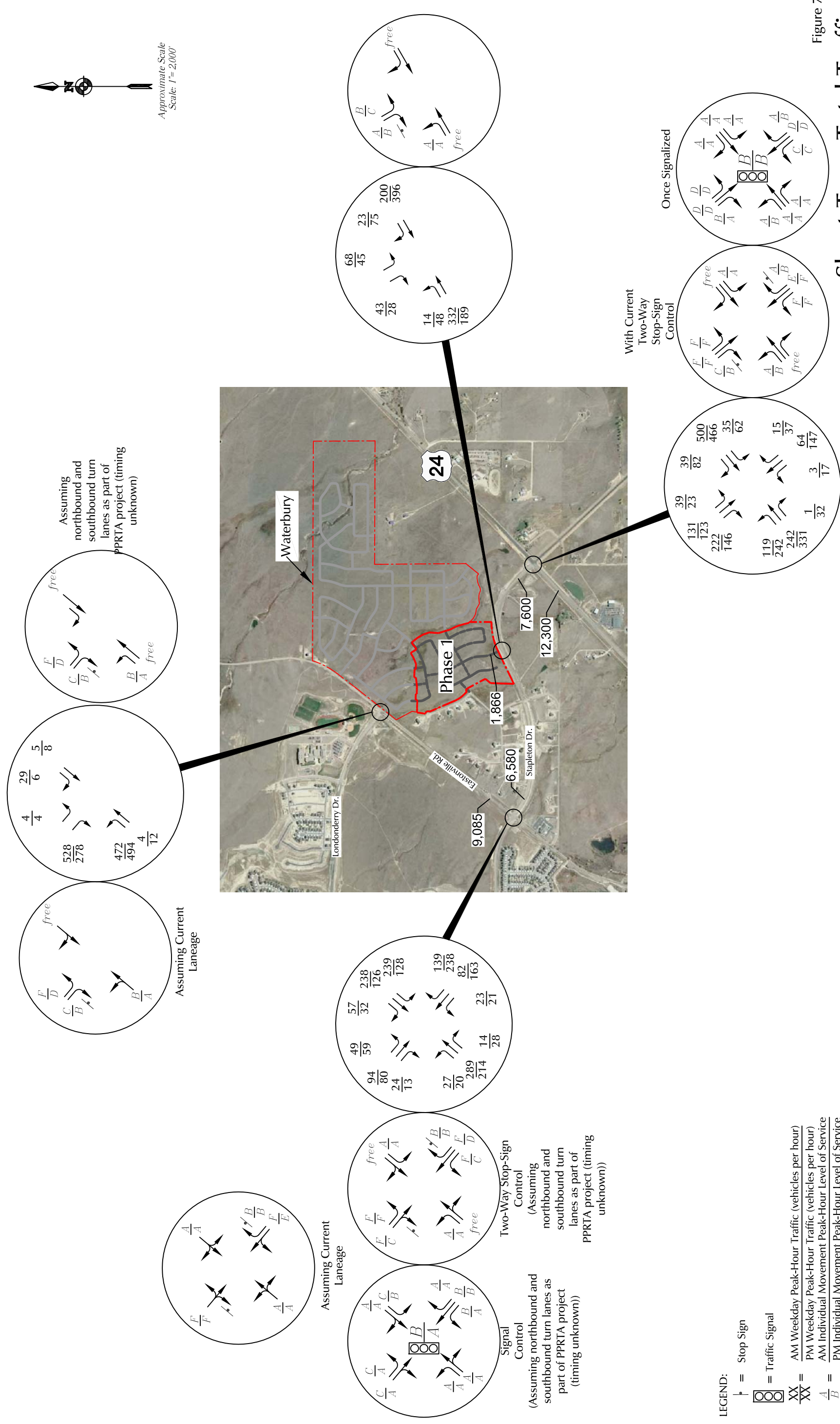
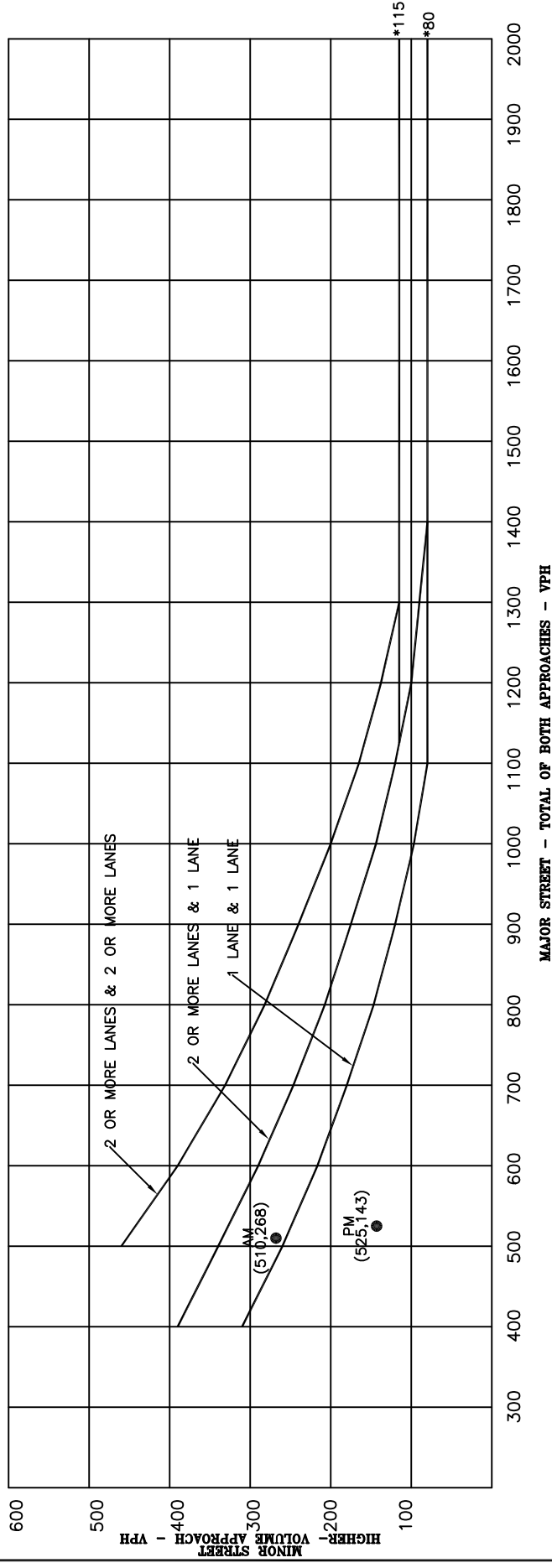


Figure 7

Short-Term Total Traffic, Lane Geometry and Traffic Control

Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



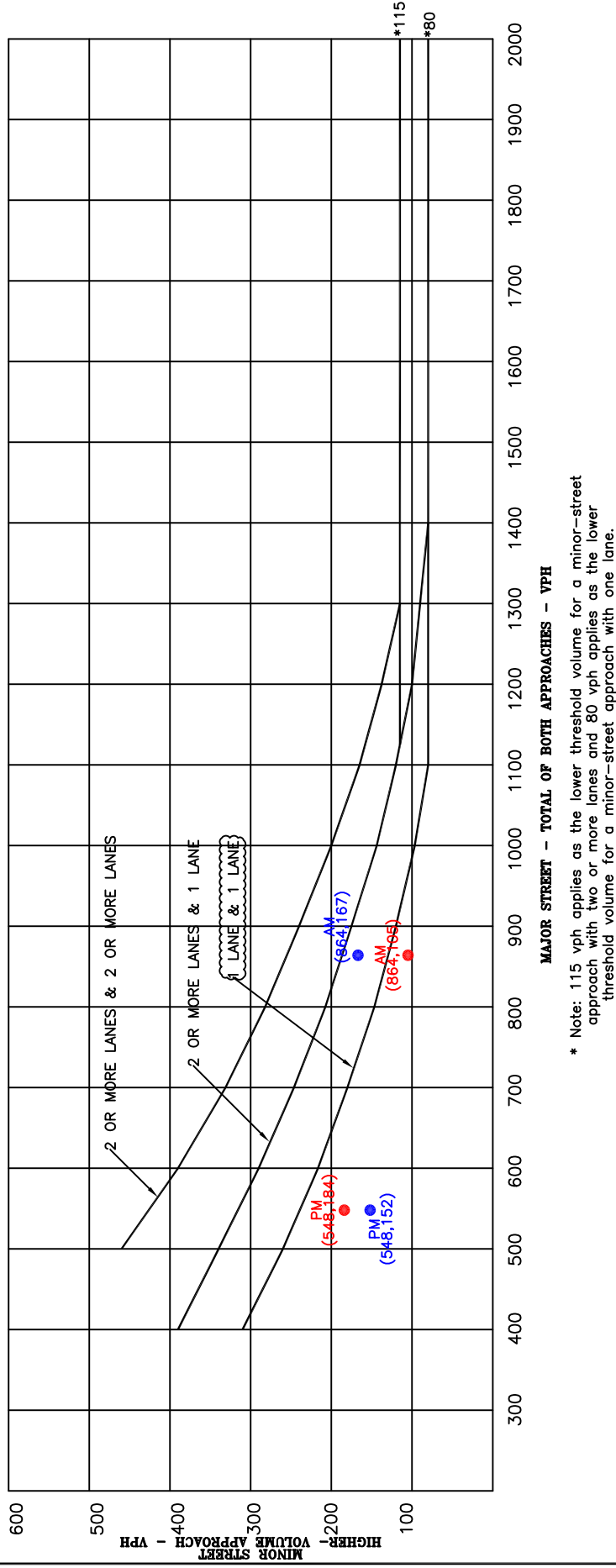
* Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 8

Traffic Signal Warrant Analysis Londonderry Dr./Eastonville Rd.

Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



● West Minor Approach and Both Directions of the Major Street:
Westbound left turning vehicles
Westbound through vehicles

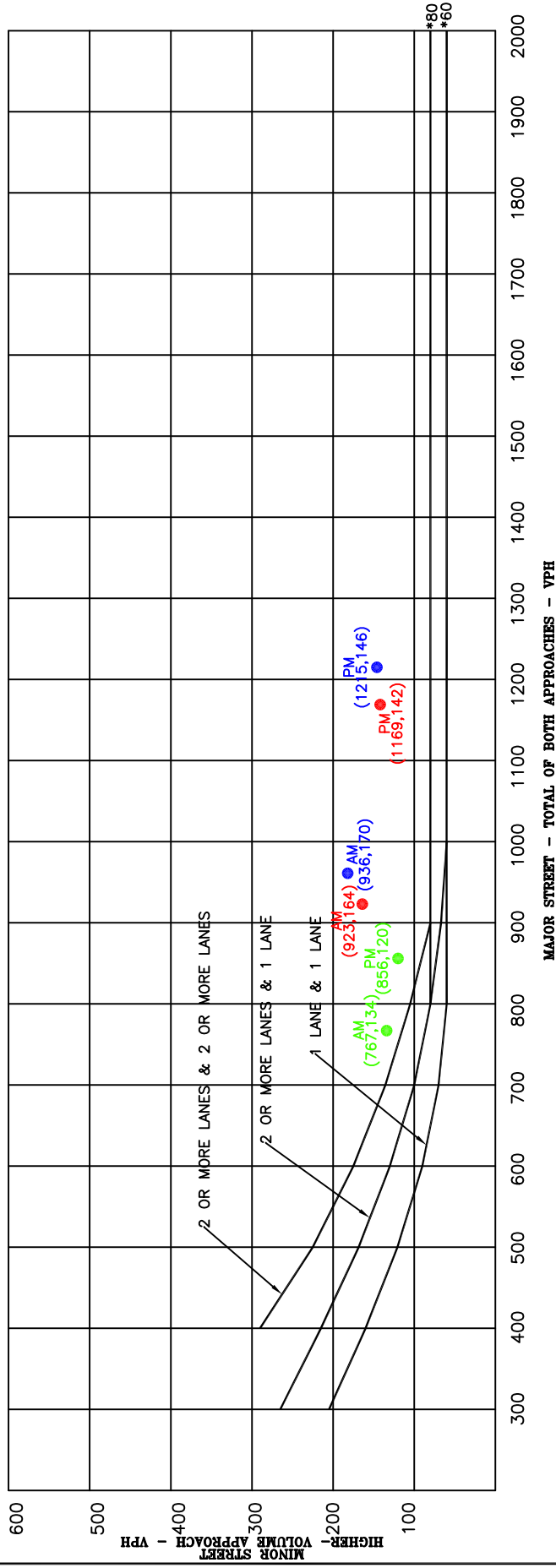
● Eastbound Minor Approach and Both Directions of the Major Street:
Eastbound left, through and right turning vehicles

Figure 9

Traffic Signal Warrant Analysis Eastonville Rd./Stapleton Dr.

Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)

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



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

- Existing Traffic
- Short-Term Background Traffic
- Short-Term Total Traffic

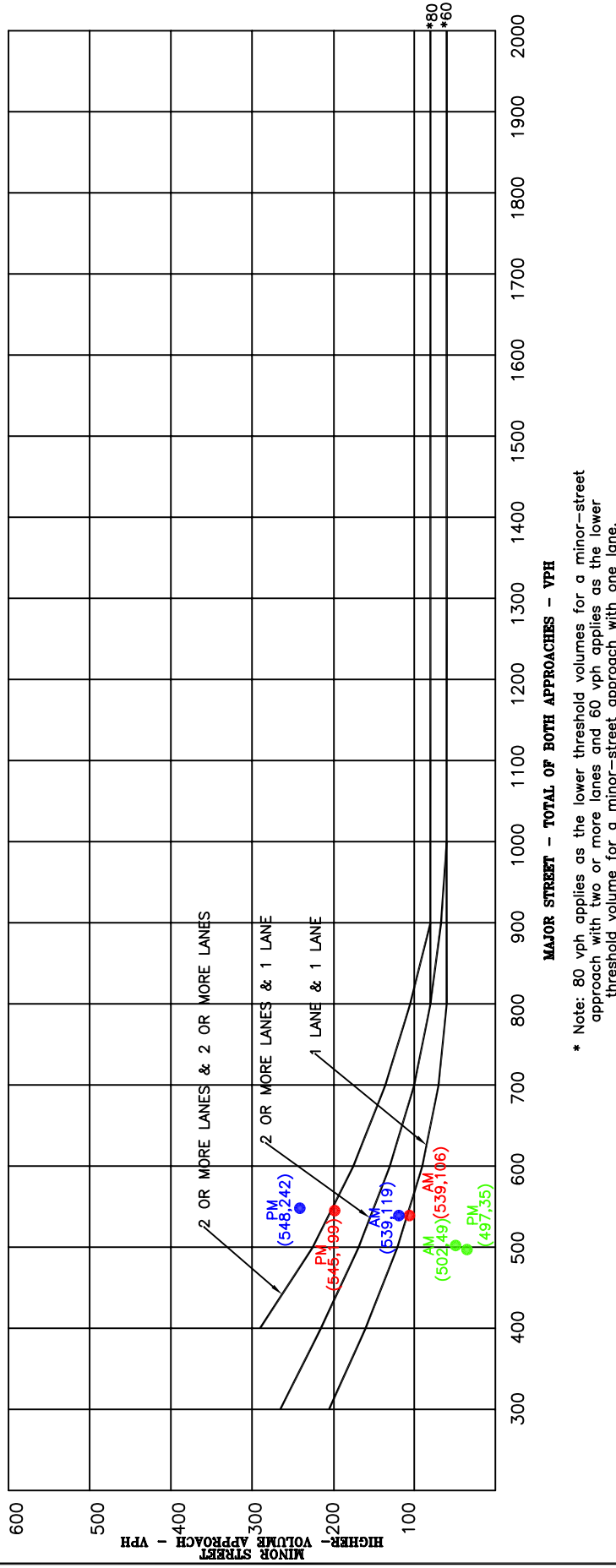
Minor Approach:
Eastbound left-turn and through traffic

Figure 10

Traffic Signal Warrant Analysis US 24/Stapleton Dr.

Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)

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



- Existing Traffic
- Short-Term Background Traffic
- Short-Term Total Traffic

- Major Approach:
 - Westbound left-turn and through
 - Minor Approach:
 - Eastbound left-turn

Figure 11

Traffic Signal Warrant Analysis US 24/Stapleton Dr. Minor Approach: US 24 Eastbound Left-Turn

Waterbury Phase 1 Filing Nos 2 and 3 (LSC #174480)

Counts by LSC

LSC Transportation Consultants, Inc.

File Name : Eastonville Rd - Stapleton Dr 5-23-17 AM

Site Code : 00174350

Start Date : 05/23/2017

Page No : 1

Groups Printed- Unshifted

	Eastonville Rd From North				Stapleton Dr From East				Eastonville Rd From South				Stapleton Dr 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	
06:30 AM	1	11	18	0	9	1	0	0	0	30	1	0	1	12	5	0	89
06:45 AM	2	16	25	0	19	5	2	0	0	42	3	0	4	17	8	0	143
07:00 AM	10	46	24	0	35	9	1	0	0	111	6	0	6	19	18	0	285
07:15 AM	10	54	37	0	25	20	1	0	7	75	7	0	2	16	6	0	260
07:30 AM	2	14	19	0	7	25	2	0	2	3	3	0	2	21	5	0	105
07:45 AM	4	7	11	0	11	15	2	0	0	8	2	0	4	29	2	0	95
08:00 AM	0	11	11	0	14	11	1	0	0	9	0	1	0	25	2	0	85
08:15 AM	3	11	22	0	7	10	1	0	1	10	2	0	0	11	2	0	80
Grand Total	32	170	167	0	127	96	10	0	10	288	24	1	19	150	48	0	1142
Apprch %	8.7	46.1	45.3	0.0	54.5	41.2	4.3	0.0	3.1	89.2	7.4	0.3	8.8	69.1	22.1	0.0	
Total %	2.8	14.9	14.6	0.0	11.1	8.4	0.9	0.0	0.9	25.2	2.1	0.1	1.7	13.1	4.2	0.0	

Counts by LSC

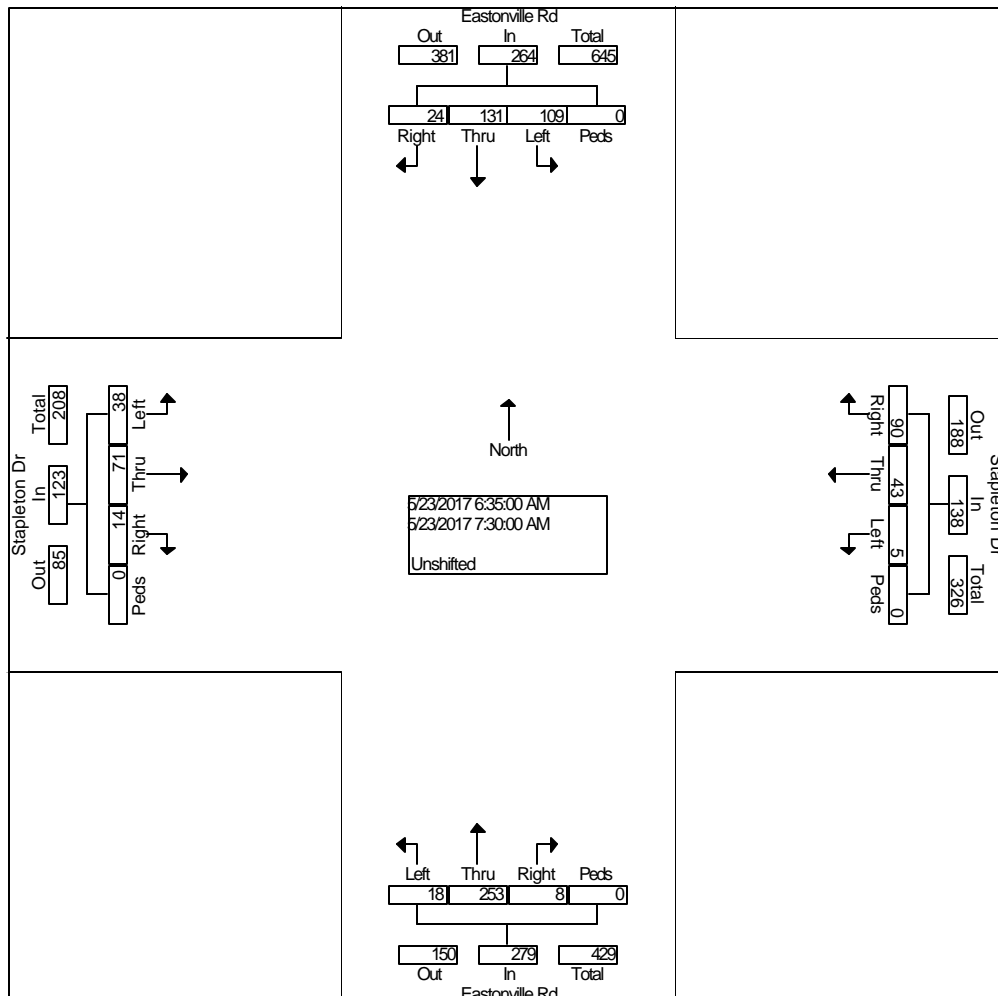
File Name : Eastonville Rd - Stapleton Dr 5-23-17 AM

Site Code : 00174350

Start Date : 05/23/2017

Page No : 2

	Eastonville Rd From North					Stapleton Dr From East					Eastonville Rd From South					Stapleton Dr 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 08:25 AM - Peak 1 of 1																					
Intersection	06:35 AM																				
Volume	24	13	10	0	264	90	43	5	0	138	8	25	18	0	279	14	71	38	0	123	804
		1	9									3									
Percent	9.1	49.	41.	0.0		65.	31.	3.6	0.0		2.9	90.	6.5	0.0		11.	57.	30.	0.0		
		6	3			2	2					7				4	7	9			
07:10																					
Volume	3	18	8	0	29	15	4	0	0	19	0	38	1	0	39	2	6	7	0	15	102
Peak																					
Factor																					0.657
High Int.	07:25 AM					07:10 AM					07:05 AM					07:05 AM					
Volume	2	23	14	0	39	15	4	0	0	19	0	39	3	0	42	3	7	5	0	15	
Peak					0.56					0.60					0.55					0.68	
Factor					4					5					4					3	



Counts by LSC

LSC Transportation Consultants, Inc.

File Name : Eastonville Rd - Stapleton Dr PM

Site Code : 00174350

Start Date : 05/11/2017

Page No : 1

Groups Printed- Unshifted

	Eastonville Rd From North				Stapleton Dr From East				Eastonville Rd From South				Stapleton Dr 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	2	19	12	0	16	19	1	0	1	23	1	0	1	13	2	0	110
04:15 PM	0	12	5	0	24	25	3	0	1	19	4	0	1	5	6	0	105
04:30 PM	3	16	12	0	16	35	5	0	2	19	3	0	2	9	9	0	131
04:45 PM	4	9	7	0	23	29	2	0	4	34	1	0	1	9	8	0	131
Total	9	56	36	0	79	108	11	0	8	95	9	0	5	36	25	0	477
05:00 PM	2	18	11	0	28	27	2	0	1	20	3	0	0	9	2	0	123
05:15 PM	1	13	8	0	25	23	0	0	1	21	0	0	0	19	2	0	113
05:30 PM	1	19	1	0	12	14	2	0	3	37	3	0	1	13	1	0	107
05:45 PM	1	16	1	0	11	13	1	0	2	31	1	0	1	9	1	0	88
Total	5	66	21	0	76	77	5	0	7	109	7	0	2	50	6	0	431
Grand Total	14	122	57	0	155	185	16	0	15	204	16	0	7	86	31	0	908
Apprch %	7.3	63.2	29.5	0.0	43.5	52.0	4.5	0.0	6.4	86.8	6.8	0.0	5.6	69.4	25.0	0.0	
Total %	1.5	13.4	6.3	0.0	17.1	20.4	1.8	0.0	1.7	22.5	1.8	0.0	0.8	9.5	3.4	0.0	

Counts by LSC

File Name : Eastonville Rd - Stapleton Dr PM
 Site Code : 00174350
 Start Date : 05/11/2017
 Page No : 2

	Eastonville Rd From North					Stapleton Dr From East					Eastonville Rd From South					Stapleton Dr 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	10	56	38	0	104	92	114	9	0	215	8	94	7	0	109	3	46	21	0	70	498
Percent	9.6	53.8	36.5	0.0		42.8	53.0	4.2	0.0		7.3	86.2	6.4	0.0		4.3	65.7	30.0	0.0		
04:45																					
Volume	4	9	7	0	20	23	29	2	0	54	4	34	1	0	39	1	9	8	0	18	131
Peak Factor																					0.950
High Int.	04:30 PM					05:00 PM					04:45 PM					05:15 PM					
Volume	3	16	12	0	31	28	27	2	0	57	4	34	1	0	39	0	19	2	0	21	
Peak Factor																					

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

LSC Transportation Consultants, Inc. **Colorado Springs, CO 80903** File Name : Hwy 24 - Stapleton Dr AM
 (719) 633-2868 Site Code : 00174140
 Start Date : 03/22/2017
 Page No : 1

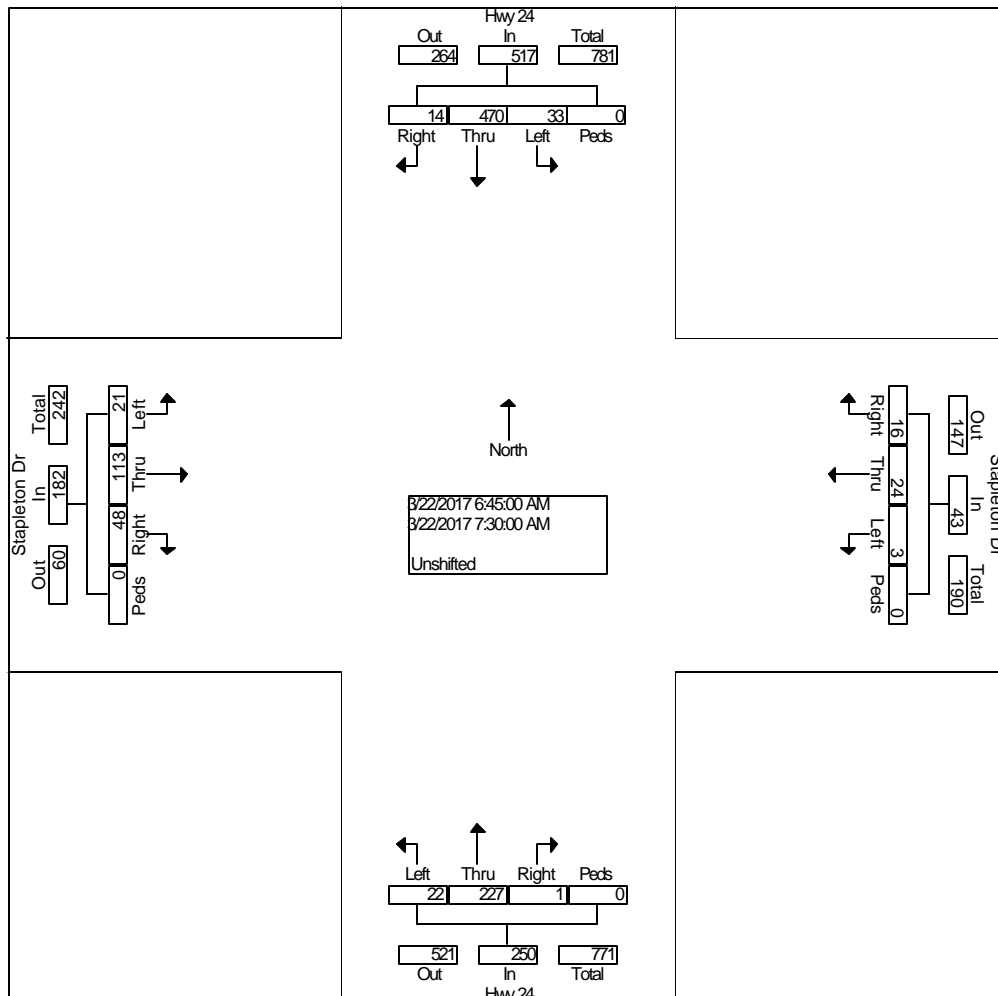
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Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	1	107	5	0	1	1	0	0	0	48	3	0	12	21	1	0	200
06:45 AM	3	115	8	0	2	6	0	0	0	47	7	0	19	38	7	0	252
Total	4	222	13	0	3	7	0	0	0	95	10	0	31	59	8	0	452
07:00 AM	5	130	13	0	4	7	0	0	0	56	6	0	11	24	5	0	261
07:15 AM	1	119	5	0	6	5	1	0	0	59	5	0	12	28	5	0	246
07:30 AM	5	106	7	0	4	6	2	0	1	65	4	0	6	23	4	0	233
07:45 AM	4	85	7	0	1	6	4	0	1	49	3	0	7	15	2	0	184
Total	15	440	32	0	15	24	7	0	2	229	18	0	36	90	16	0	924
08:00 AM	5	77	7	0	2	3	3	0	2	62	4	0	9	19	2	0	195
08:15 AM	1	91	3	0	4	2	0	0	2	61	1	0	7	4	7	0	183
Grand Total	25	830	55	0	24	36	10	0	6	447	33	0	83	172	33	0	1754
Apprch %	2.7	91.2	6.0	0.0	34.3	51.4	14.3	0.0	1.2	92.0	6.8	0.0	28.8	59.7	11.5	0.0	
Total %	1.4	47.3	3.1	0.0	1.4	2.1	0.6	0.0	0.3	25.5	1.9	0.0	4.7	9.8	1.9	0.0	

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

File Name : Hwy 24 - Stapleton Dr AM
 Site Code : 00174140
 Start Date : 03/22/2017
 Page No : 2

	Hwy 24 From North					Stapleton Dr From East					Hwy 24 From South					Stapleton Dr 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	06:45 AM																				
Volume	14	47 0	33	0	517	16	24	3	0	43	1	22 7	22	0	250	48	11 3	21	0	182	992
Percent	2.7	90. 9	6.4	0.0		37. 2	55. 8	7.0	0.0		0.4	90. 8	8.8	0.0		26. 4	62. 1	11. 5	0.0		
07:00 Volume	5	13 0	13	0	148	4	7	0	0	11	0	56	6	0	62	11	24	5	0	40	261
Peak Factor																					0.950
High Int.	07:00 AM					07:15 AM					07:30 AM					06:45 AM					
Volume	5	13 0	13	0	148	6	5	1	0	12	1	65	4	0	70	19	38	7	0	64	
Peak Factor					0.87 3					0.89 6					0.89 3					0.71 1	



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(719) 633-2868 Site Code : 00174140
Start Date : 03/21/2017
Page No : 1

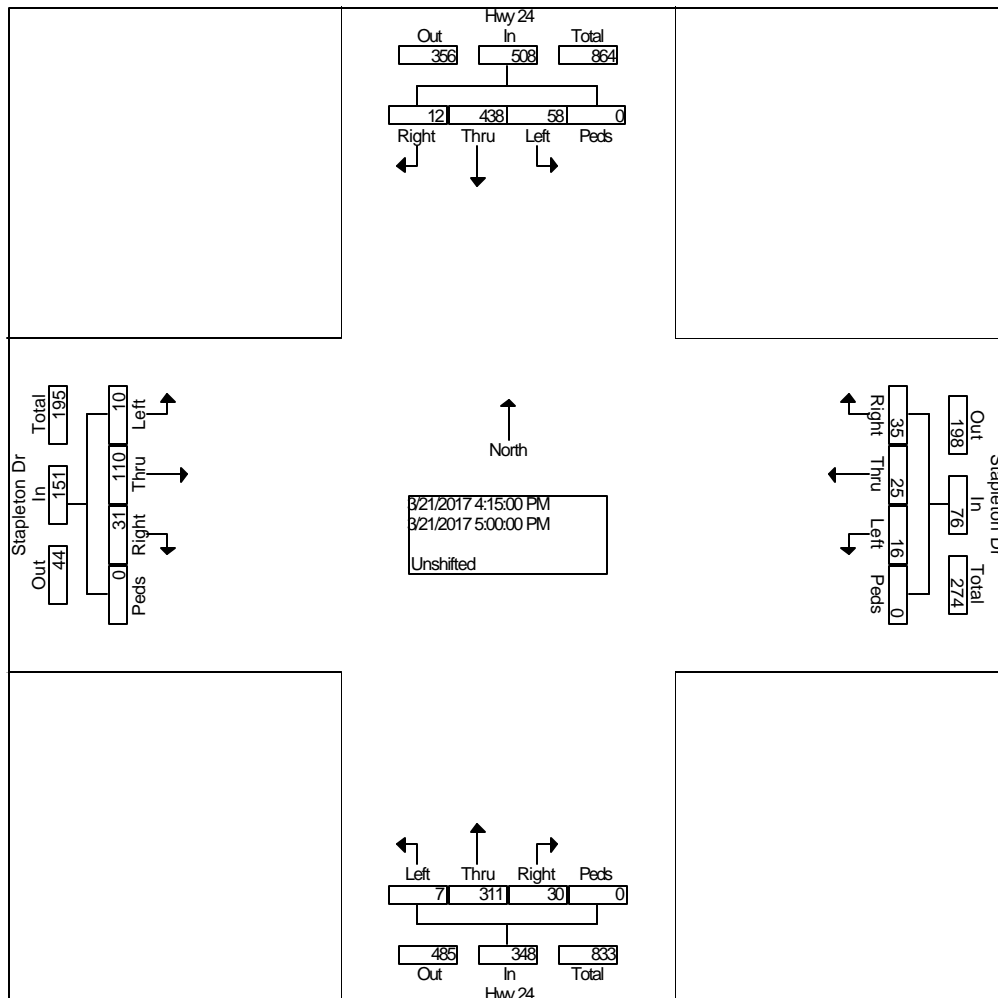
Groups Printed- Unshifted

	Hwy 24 From North				Stapleton Dr From East				Hwy 24 From South				Stapleton Dr 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	5	93	25	0	4	3	1	0	4	67	5	0	6	17	2	2	234
04:15 PM	4	109	17	0	10	5	1	0	9	75	1	0	7	20	2	0	260
04:30 PM	2	118	23	0	10	8	8	0	3	81	5	0	4	30	4	0	296
04:45 PM	2	120	10	0	8	5	4	0	8	83	0	0	4	24	2	0	270
Total	13	440	75	0	32	21	14	0	24	306	11	0	21	91	10	2	1060
05:00 PM	4	91	8	0	7	7	3	0	10	72	1	0	16	36	2	0	257
05:15 PM	2	94	12	0	6	12	2	0	2	51	1	0	17	23	2	0	224
05:30 PM	0	154	12	0	5	5	5	0	7	62	2	0	17	19	0	0	288
05:45 PM	1	128	20	0	4	5	5	0	7	83	1	0	13	19	1	0	287
Total	7	467	52	0	22	29	15	0	26	268	5	0	63	97	5	0	1056
Grand Total	20	907	127	0	54	50	29	0	50	574	16	0	84	188	15	2	2116
Apprch %	1.9	86.1	12.0	0.0	40.6	37.6	21.8	0.0	7.8	89.7	2.5	0.0	29.1	65.1	5.2	0.7	
Total %	0.9	42.9	6.0	0.0	2.6	2.4	1.4	0.0	2.4	27.1	0.8	0.0	4.0	8.9	0.7	0.1	

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File Name : Hwy 24 - Stapleton Dr PM
 Site Code : 00174140
 Start Date : 03/21/2017
 Page No : 2

	Hwy 24 From North					Stapleton Dr From East					Hwy 24 From South					Stapleton Dr 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	04:15 PM																				
Volume	12	438	58	0	508	35	25	16	0	76	30	311	7	0	348	31	110	10	0	151	1083
Percent	2.4	86.2	11.4	0.0		46.1	32.9	21.1	0.0		8.6	89.4	2.0	0.0		20.5	72.8	6.6	0.0		
04:30																					
Volume	2	118	23	0	143	10	8	8	0	26	3	81	5	0	89	4	30	4	0	38	296
Peak Factor																					0.915
High Int.	04:30 PM					04:30 PM					04:45 PM					05:00 PM					
Volume	2	118	23	0	143	10	8	8	0	26	8	83	0	0	91	16	36	2	0	54	
Peak Factor	0.888					0.731					0.956					0.699					



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545 E. Pikes Peak Ave., #210
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(719) 633-2888

LSC Transportation Consultants, Inc.

Field No: 00154570 Eastonville Rd - Londonderry Dr 1-20-16 AM

Site Code : 00154570

Start Date : 01/20/2016

Page No : 1

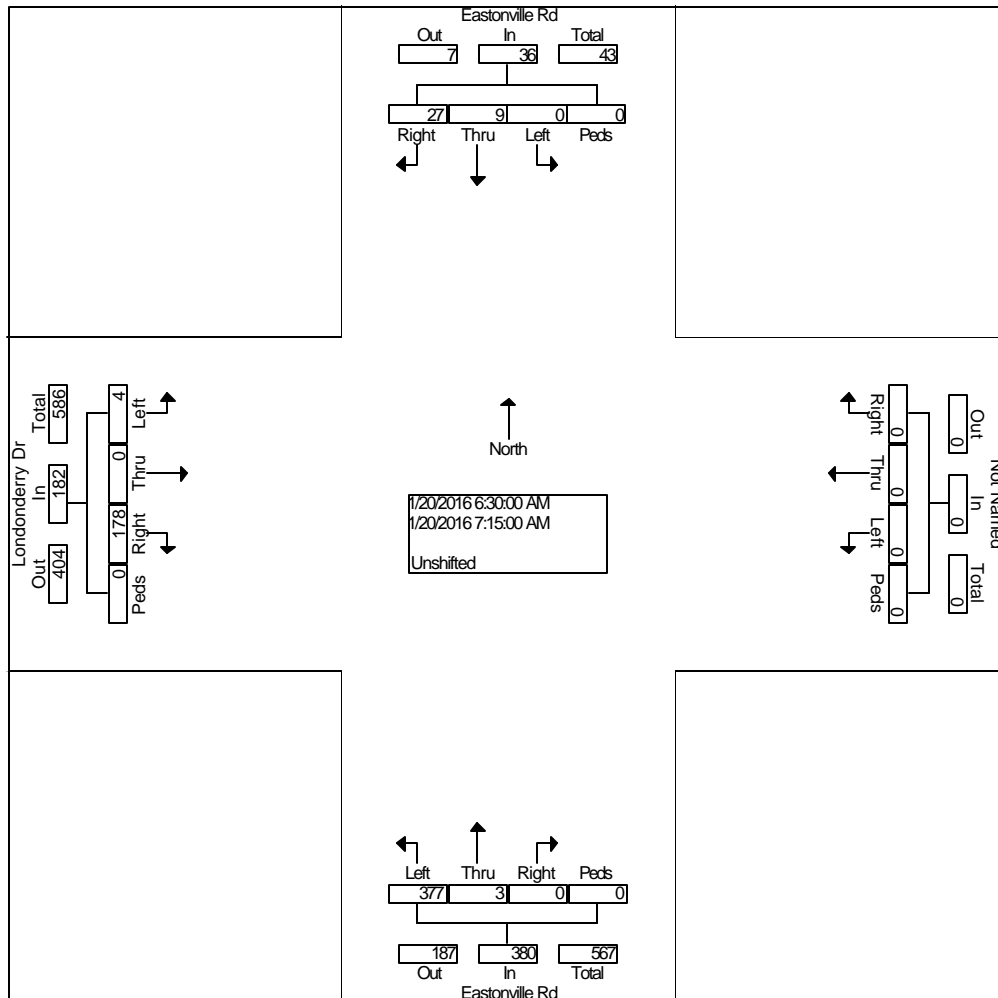
Groups Printed- Unshifted

	Eastonville Rd From North				From East				Eastonville Rd From South				Londonderry Dr 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	
06:30 AM	0	6	0	0	0	0	0	0	0	1	18	0	18	0	0	0	43
06:45 AM	1	1	0	0	0	0	0	0	0	0	44	0	27	0	0	0	73
Total	1	7	0	0	0	0	0	0	0	1	62	0	45	0	0	0	116
07:00 AM	7	1	0	0	0	0	0	0	0	0	163	0	53	0	0	0	224
07:15 AM	19	1	0	0	0	0	0	0	0	2	152	0	80	0	4	0	258
07:30 AM	2	2	0	0	0	0	0	0	0	1	16	0	21	0	0	0	42
07:45 AM	0	4	0	0	0	0	0	0	0	2	10	0	13	0	0	0	29
Total	28	8	0	0	0	0	0	0	0	5	341	0	167	0	4	0	553
08:00 AM	3	1	0	0	0	0	0	0	0	2	13	0	12	0	0	0	31
08:15 AM	1	11	0	0	0	0	0	0	0	1	11	0	26	0	3	0	53
Grand Total	33	27	0	0	0	0	0	0	0	9	427	0	250	0	7	0	753
Apprch %	55.0	45.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	97.9	0.0	97.3	0.0	2.7	0.0	
Total %	4.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	56.7	0.0	33.2	0.0	0.9	0.0	

LSC Transportation Consultants, Inc.
 545 E. Pikes Peak Ave., #210
 Colorado Springs, CO 80903
 (719) 633-2888

Eastonville Rd - Londonderry Dr 1-20-16 AM
 Site Code : 00154570
 Start Date : 01/20/2016
 Page No : 2

	Eastonville Rd From North					From East					Eastonville Rd From South					Londonderry Dr From West					
Start Time	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersecti on	06:30 AM																				
Volume	27	9	0	0	36	0	0	0	0	0	0	3	377	0	380	178	0	4	0	182	598
Percent	75. 0	25. 0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.8	99. 2	0.0		97. 8	0.0	2.2	0.0		
07:15 Volume	19	1	0	0	20	0	0	0	0	0	0	2	152	0	154	80	0	4	0	84	258
Peak Factor																					0.579
High Int.	07:15 AM					6:15:00 AM					07:00 AM					07:15 AM					
Volume	19	1	0	0	20	0	0	0	0	0	0	0	163	0	163	80	0	4	0	84	
Peak Factor	0.450										0.583					0.542					



LSC Transportation Consultants, Inc.

516 N. Tejon St.

LSC Transportation Consultants, Inc.

Colorado Springs, CO File Name : Eastonville Rd - Londonderry Dr PM

(719) 633-2868

Site Code : 00144640

Start Date : 11/05/2014

Page No : 1

Groups Printed- Unshifted

	Eastonville Rd From North				From East				Eastonville Rd From South				Londonderry Dr 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	0	2	0	0	0	0	0	0	0	4	20	0	29	0	0	0	55
04:15 PM	0	2	0	0	0	0	0	0	0	3	20	0	22	0	0	0	47
04:30 PM	0	2	0	0	0	0	0	0	0	1	21	0	22	0	1	0	47
04:45 PM	1	1	0	0	0	0	0	0	0	4	34	0	12	0	2	0	54
Total	1	7	0	0	0	0	0	0	0	12	95	0	85	0	3	0	203
05:00 PM	0	3	0	0	0	0	0	0	0	4	19	0	61	0	1	0	88
05:15 PM	0	1	0	0	0	0	0	0	0	1	20	0	43	0	1	0	66
05:30 PM	5	2	0	0	0	0	0	0	0	2	27	0	14	0	0	0	50
05:45 PM	2	4	0	0	0	0	0	0	0	3	35	0	6	0	0	0	50
Total	7	10	0	0	0	0	0	0	0	10	101	0	124	0	2	0	254
Grand Total	8	17	0	0	0	0	0	0	0	22	196	0	209	0	5	0	457
Apprch %	32.0	68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	89.9	0.0	97.7	0.0	2.3	0.0	
Total %	1.8	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	42.9	0.0	45.7	0.0	1.1	0.0	

LSC Transportation Consultants, Inc.

516 N. Tejon St.

Colorado Springs, CO File Name : Eastonville Rd - Londonderry Dr PM

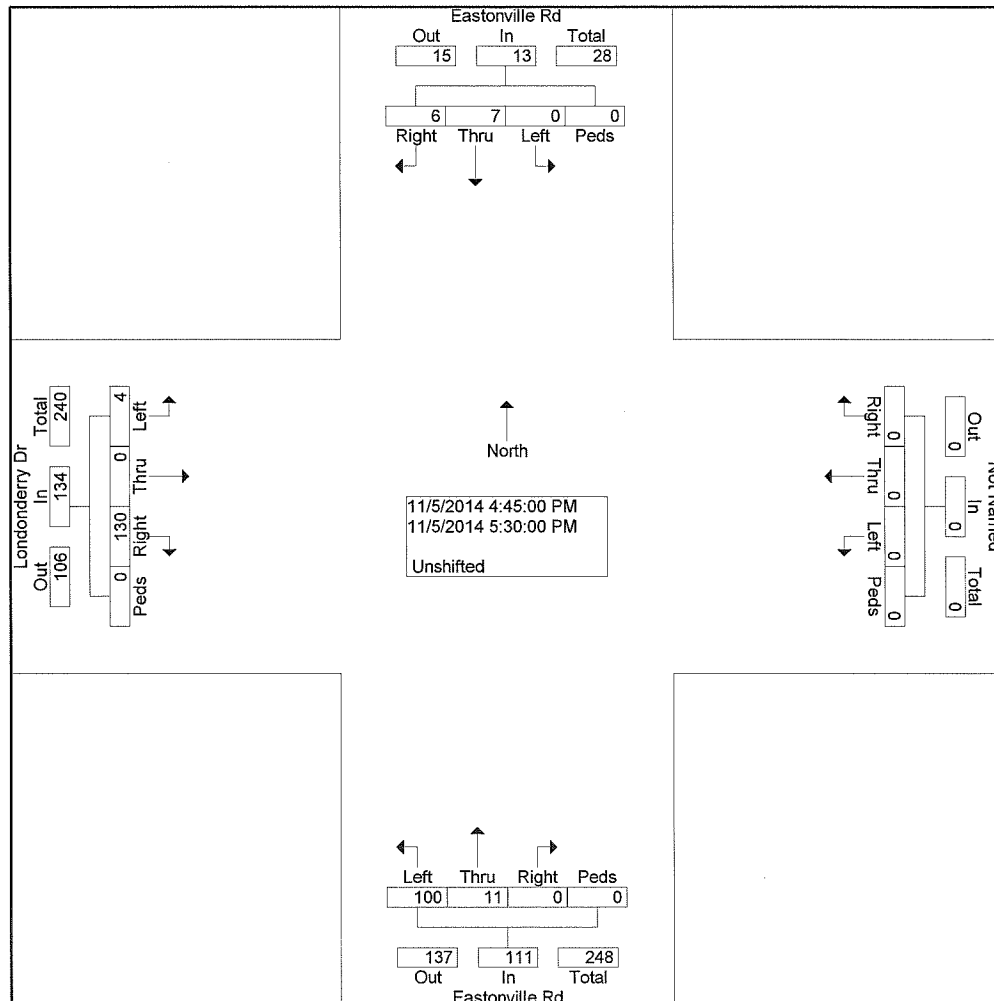
(719) 633-2868

Site Code : 00144640

Start Date : 11/05/2014





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	Eastonville Rd From North					From East					Eastonville Rd From South					Londonderry Dr From West					
Start Time	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	6	7	0	0	13	0	0	0	0	0	0	11	100	0	111	130	0	4	0	134	258
Percent	46.2	53.8	0.0	0.0		0.0	0.0	0.0	0.0		0.0	9.9	90.1	0.0		97.0	0.0	3.0	0.0		
05:00																					
Volume	0	3	0	0	3	0	0	0	0	0	0	4	19	0	23	61	0	1	0	62	88
Peak Factor																					0.733
High Int.	05:30 PM					3:45:00 PM					04:45 PM					05:00 PM					
Volume	5	2	0	0	7	0	0	0	0	0	0	4	34	0	38	61	0	1	0	62	
Peak Factor	0.464										0.730					0.540					



HCM 2010 TWSC
7: Eastonville Rd & Londonderry Dr






Existing Traffic
AM Peak Hour

Intersection							
Int Delay, s/veh	9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	4	260	378	3	5	29	
Future Vol, veh/h	4	260	378	3	5	29	
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	0	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	76	76	58	58	43	43	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	5	342	652	5	12	67	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1355	46	79	0	-	0	
Stage 1	46	-	-	-	-	-	
Stage 2	1309	-	-	-	-	-	
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	165	1023	1519	-	-	-	
Stage 1	976	-	-	-	-	-	
Stage 2	253	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	94	1023	1519	-	-	-	
Mov Cap-2 Maneuver	94	-	-	-	-	-	
Stage 1	556	-	-	-	-	-	
Stage 2	253	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	10.8	9.1		0			
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1519	-	94	1023	-	-	
HCM Lane V/C Ratio	0.429	-	0.056	0.334	-	-	
HCM Control Delay (s)	9.1	0	45.6	10.3	-	-	
HCM Lane LOS	A	A	E	B	-	-	
HCM 95th %tile Q(veh)	2.2	-	0.2	1.5	-	-	

Intersection												
Int Delay, s/veh	6.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	113	48	3	57	14	49	227	1	33	470	32
Future Vol, veh/h	21	113	48	3	57	14	49	227	1	33	470	32
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	185	-	325	225	-	225	1000	-	0	785	-	785
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	95	95	95	100	100	100	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	113	48	3	60	15	49	227	1	38	540	37
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	979	942	540	1040	978	227	577	0	0	228	0	0
Stage 1	616	616	-	325	325	-	-	-	-	-	-	-
Stage 2	363	326	-	715	653	-	-	-	-	-	-	-
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	229	263	542	208	250	812	996	-	-	1340	-	-
Stage 1	478	482	-	687	649	-	-	-	-	-	-	-
Stage 2	656	648	-	422	464	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	170	243	542	114	231	812	996	-	-	1340	-	-
Mov Cap-2 Maneuver	170	243	-	114	231	-	-	-	-	-	-	-
Stage 1	455	469	-	653	617	-	-	-	-	-	-	-
Stage 2	553	616	-	284	451	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	26.5			23.3			1.6			0.5		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	996	-	-	170	243	542	114	231	812	1340	-	-
HCM Lane V/C Ratio	0.049	-	-	0.124	0.465	0.089	0.028	0.26	0.018	0.028	-	-
HCM Control Delay (s)	8.8	-	-	29.1	32.1	12.3	37.5	26	9.5	7.8	-	-
HCM Lane LOS	A	-	-	D	D	B	E	D	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.4	2.3	0.3	0.1	1	0.1	0.1	-	-





HCM 2010 TWSC
35: Eastonville Rd & Stapleton Dr













Existing Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	24.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	71	14	5	43	90	18	253	8	110	131	24
Future Vol, veh/h	38	71	14	5	43	90	18	253	8	110	131	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	71	71	71	60	60	60	79	76	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	108	21	7	61	127	30	422	13	139	172	30
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1048	960	187	1019	969	429	202	0	0	435	0	0
Stage 1	465	465	-	489	489	-	-	-	-	-	-	-
Stage 2	583	495	-	530	480	-	-	-	-	-	-	-
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	206	257	855	215	254	626	1370	-	-	1125	-	-
Stage 1	578	563	-	561	549	-	-	-	-	-	-	-
Stage 2	498	546	-	533	554	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	113	215	855	112	212	626	1370	-	-	1125	-	-
Mov Cap-2 Maneuver	113	215	-	112	212	-	-	-	-	-	-	-
Stage 1	561	484	-	545	533	-	-	-	-	-	-	-
Stage 2	342	530	-	348	476	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	129.8			19.5			0.5			3.5		
HCM LOS	F			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	1370	-	-	180	194	626	1125	-	-			
HCM Lane V/C Ratio	0.022	-	-	1.035	0.348	0.202	0.124	-	-			
HCM Control Delay (s)	7.7	0	-	129.8	33.2	12.2	8.7	0	-			
HCM Lane LOS	A	A	-	F	D	B	A	A	-			
HCM 95th %tile Q(veh)	0.1	-	-	8.8	1.5	0.8	0.4	-	-			

HCM 2010 TWSC
7: Eastonville Rd & Londonderry Dr






Existing Traffic
PM Peak Hour

Intersection							
Int Delay, s/veh	7.8						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	4	97	196	11	7	6	
Future Vol, veh/h	4	97	196	11	7	6	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	0	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	54	54	100	100	100	100	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	7	180	196	11	7	6	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	413	10	13	0	-	0	
Stage 1	10	-	-	-	-	-	
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	595	1071	1606	-	-	-	
Stage 1	1013	-	-	-	-	-	
Stage 2	675	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	522	1071	1606	-	-	-	
Mov Cap-2 Maneuver	522	-	-	-	-	-	
Stage 1	888	-	-	-	-	-	
Stage 2	675	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	9.1	7.2		0			
HCM LOS	A						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1606	-	522	1071	-	-	
HCM Lane V/C Ratio	0.122	-	0.014	0.168	-	-	
HCM Control Delay (s)	7.6	0	12	9	-	-	
HCM Lane LOS	A	A	B	A	-	-	
HCM 95th %tile Q(veh)	0.4	-	0	0.6	-	-	

Intersection												
Int Delay, s/veh	15.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	110	31	16	124	35	35	311	30	58	438	59
Future Vol, veh/h	10	110	31	16	124	35	35	311	30	58	438	59
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	185	-	325	225	-	225	1000	-	0	785	-	785
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	73	73	73	98	98	98	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	111	31	22	170	48	36	317	31	65	492	66
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1136	1042	492	1115	1077	317	558	0	0	348	0	0
Stage 1	622	622	-	389	389	-	-	-	-	-	-	-
Stage 2	514	420	-	726	688	-	-	-	-	-	-	-
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	179	230	577	185	219	724	1013	-	-	1211	-	-
Stage 1	474	479	-	635	608	-	-	-	-	-	-	-
Stage 2	543	589	-	416	447	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	45	210	577	96	200	724	1013	-	-	1211	-	-
Mov Cap-2 Maneuver	45	210	-	96	200	-	-	-	-	-	-	-
Stage 1	457	453	-	612	586	-	-	-	-	-	-	-
Stage 2	347	568	-	281	423	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	38.5			62.7			0.8			0.9		
HCM LOS	E			F								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1013	-	-	45	210	577	96	200	724	1211	-	-
HCM Lane V/C Ratio	0.035	-	-	0.224	0.529	0.054	0.228	0.849	0.066	0.054	-	-
HCM Control Delay (s)	8.7	-	-	106.8	39.9	11.6	53.3	78.7	10.3	8.1	-	-
HCM Lane LOS	A	-	-	F	E	B	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	2.8	0.2	0.8	6.3	0.2	0.2	-	-

HCM 2010 TWSC
35: Eastonville Rd & Stapleton Dr







Existing Traffic
PM Peak Hour





Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	46	3	9	114	92	7	94	8	38	56	10
Future Vol, veh/h	21	46	3	9	114	92	7	94	8	38	56	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	96	96	96	100	100	100	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	52	3	9	119	96	7	94	8	45	67	12













Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	383	279	73	303	281	98	79	0	0	102	0	0
Stage 1	163	163	-	112	112	-	-	-	-	-	-	-
Stage 2	220	116	-	191	169	-	-	-	-	-	-	-
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	575	629	989	649	627	958	1519	-	-	1490	-	-
Stage 1	839	763	-	893	803	-	-	-	-	-	-	-
Stage 2	782	800	-	811	759	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	427	606	989	587	604	958	1519	-	-	1490	-	-
Mov Cap-2 Maneuver	427	606	-	587	604	-	-	-	-	-	-	-
Stage 1	835	739	-	889	799	-	-	-	-	-	-	-
Stage 2	596	796	-	727	735	-	-	-	-	-	-	-






Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	11.1	0.5	2.7
HCM LOS	B	B		







Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1519	-	-	546 603 958	1490	-	-
HCM Lane V/C Ratio	0.005	-	-	0.146 0.212 0.1	0.03	-	-
HCM Control Delay (s)	7.4	0	-	12.7 12.6 9.2	7.5	0	-
HCM Lane LOS	A	A	-	B B A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5 0.8 0.3	0.1	-	-





Intersection							
Int Delay, s/veh	0.8						
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Vol, veh/h	5	332	200	8	23	15	
Future Vol, veh/h	5	332	200	8	23	15	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	235	-	-	235	0	0	
Veh in Median Storage, #	-	0	0	-	0	-	
Grade, %	-	0	0	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	5	361	217	9	25	16	
Major/Minor	Major1		Major2		Minor2		
Conflicting Flow All	226	0	-	0	588	217	
Stage 1	-	-	-	-	217	-	
Stage 2	-	-	-	-	371	-	
Critical Hdwy	4.12	-	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1342	-	-	-	471	823	
Stage 1	-	-	-	-	819	-	
Stage 2	-	-	-	-	698	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1342	-	-	-	469	823	
Mov Cap-2 Maneuver	-	-	-	-	469	-	
Stage 1	-	-	-	-	816	-	
Stage 2	-	-	-	-	698	-	
Approach	EB		WB		SB		
HCM Control Delay, s	0.1		0		11.7		
HCM LOS					B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2	
Capacity (veh/h)	1342	-	-	-	469	823	
HCM Lane V/C Ratio	0.004	-	-	-	0.053	0.02	
HCM Control Delay (s)	7.7	-	-	-	13.1	9.5	
HCM Lane LOS	A	-	-	-	B	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.1	

Intersection							
Int Delay, s/veh	12.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	4	528	470	3	5	29	
Future Vol, veh/h	4	528	470	3	5	29	
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	0	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	76	76	58	58	43	43	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	5	695	810	5	12	67	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1671	46	79	0	-	0	
Stage 1	46	-	-	-	-	-	
Stage 2	1625	-	-	-	-	-	
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	105	1023	1519	-	-	-	
Stage 1	976	-	-	-	-	-	
Stage 2	177	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	49	1023	1519	-	-	-	
Mov Cap-2 Maneuver	49	-	-	-	-	-	
Stage 1	454	-	-	-	-	-	
Stage 2	177	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	16.1	10		0			
HCM LOS	C						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1519	-	49	1023	-	-	
HCM Lane V/C Ratio	0.533	-	0.107	0.679	-	-	
HCM Control Delay (s)	10	0	87.1	15.6	-	-	
HCM Lane LOS	B	A	F	C	-	-	
HCM 95th %tile Q(veh)	3.3	-	0.3	5.6	-	-	

Intersection												
Int Delay, s/veh	12.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	129	183	3	64	15	106	242	1	35	500	39
Future Vol, veh/h	37	129	183	3	64	15	106	242	1	35	500	39
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	185	-	325	225	-	225	1000	-	0	785	-	785
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	95	95	95	100	100	100	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	129	183	3	67	16	106	242	1	40	575	45
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1151	1110	575	1288	1154	242	620	0	0	243	0	0
Stage 1	655	655	-	454	454	-	-	-	-	-	-	-
Stage 2	496	455	-	834	700	-	-	-	-	-	-	-
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	175	209	518	141	197	797	960	-	-	1323	-	-
Stage 1	455	463	-	586	569	-	-	-	-	-	-	-
Stage 2	556	569	-	362	441	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	107	180	518	35	170	797	960	-	-	1323	-	-
Mov Cap-2 Maneuver	107	180	-	35	170	-	-	-	-	-	-	-
Stage 1	405	449	-	522	506	-	-	-	-	-	-	-
Stage 2	420	506	-	162	428	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	37.7			36.8			2.8			0.5		
HCM LOS	E			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	960	-	-	107	180	518	35	170	797	1323	-	-
HCM Lane V/C Ratio	0.11	-	-	0.346	0.717	0.353	0.09	0.396	0.02	0.03	-	-
HCM Control Delay (s)	9.2	-	-	55.5	63.8	15.7	117.8	39.4	9.6	7.8	-	-
HCM Lane LOS	A	-	-	F	F	C	F	E	A	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	1.4	4.5	1.6	0.3	1.7	0.1	0.1	-	-

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	89	24	11	69	135	27	289	10	238	238	57
Future Vol, veh/h	49	89	24	11	69	135	27	289	10	238	238	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	71	71	71	60	60	60	79	76	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	135	36	15	97	190	45	482	17	301	313	72
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1675	1540	349	1618	1568	491	385	0	0	499	0	0
Stage 1	951	951	-	581	581	-	-	-	-	-	-	-
Stage 2	724	589	-	1037	987	-	-	-	-	-	-	-
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	76	~ 115	694	83	111	578	1173	-	-	1065	-	-
Stage 1	312	338	-	499	500	-	-	-	-	-	-	-
Stage 2	417	495	-	279	325	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 69	694	-	~ 67	578	1173	-	-	1065	-	-
Mov Cap-2 Maneuver	-	~ 69	-	-	~ 67	-	-	-	-	-	-	-
Stage 1	295	215	-	473	474	-	-	-	-	-	-	-
Stage 2	211	469	-	63	207	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s							0.7			4.3		
HCM LOS	-			-								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	1173	-	-	-	-	578	1065	-	-			
HCM Lane V/C Ratio	0.038	-	-	-	-	0.329	0.283	-	-			
HCM Control Delay (s)	8.2	0	-	-	-	14.3	9.7	0	-			
HCM Lane LOS	A	A	-	-	-	B	A	A	-			
HCM 95th %tile Q(veh)	0.1	-	-	-	-	1.4	1.2	-	-			
Notes												
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon												

Intersection							
Int Delay, s/veh		0.7					
Movement	EBL	EBT		WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	16	189		396	26	15	10
Future Vol, veh/h	16	189		396	26	15	10
Conflicting Peds, #/hr	0	0		0	0	0	0
Sign Control	Free	Free		Free	Free	Stop	Stop
RT Channelized	-	None		-	None	-	None
Storage Length	235	-		-	235	0	0
Veh in Median Storage, #	-	0		0	-	0	-
Grade, %	-	0		0	-	0	-
Peak Hour Factor	92	92		81	81	92	92
Heavy Vehicles, %	2	2		2	2	2	2
Mvmt Flow	17	205		489	32	16	11
Major/Minor	Major1			Major2		Minor2	
Conflicting Flow All	521	0		-	0	728	489
Stage 1	-	-		-	-	489	-
Stage 2	-	-		-	-	239	-
Critical Hdwy	4.12	-		-	-	6.42	6.22
Critical Hdwy Stg 1	-	-		-	-	5.42	-
Critical Hdwy Stg 2	-	-		-	-	5.42	-
Follow-up Hdwy	2.218	-		-	-	3.518	3.318
Pot Cap-1 Maneuver	1045	-		-	-	390	579
Stage 1	-	-		-	-	616	-
Stage 2	-	-		-	-	801	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1045	-		-	-	384	579
Mov Cap-2 Maneuver	-	-		-	-	384	-
Stage 1	-	-		-	-	606	-
Stage 2	-	-		-	-	801	-
Approach	EB			WB		SB	
HCM Control Delay, s	0.7			0		13.4	
HCM LOS						B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2	
Capacity (veh/h)	1045	-	-	-	384	579	
HCM Lane V/C Ratio	0.017	-	-	-	0.042	0.019	
HCM Control Delay (s)	8.5	-	-	-	14.8	11.3	
HCM Lane LOS	A	-	-	-	B	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.1	

























Intersection						
Int Delay, s/veh	9.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	275	497	11	7	6
Future Vol, veh/h	4	275	497	11	7	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	509	497	11	7	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1015	10	13	0	-	0
Stage 1	10	-	-	-	-	-
Stage 2	1005	-	-	-	-	-
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	264	1071	1606	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	354	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	182	1071	1606	-	-	-
Mov Cap-2 Maneuver	182	-	-	-	-	-
Stage 1	698	-	-	-	-	-
Stage 2	354	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	8.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1606	-	182	1071	-	-
HCM Lane V/C Ratio	0.309	-	0.041	0.475	-	-
HCM Control Delay (s)	8.2	0	25.6	11.4	-	-
HCM Lane LOS	A	A	D	B	-	-
HCM 95th %tile Q(veh)	1.3	-	0.1	2.6	-	-

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↑	↔	↔	↑	↔	↔	↑	↔
Traffic Vol, veh/h	21	121	120	17	144	37	199	331	32	62	466	79
Future Vol, veh/h	21	121	120	17	144	37	199	331	32	62	466	79
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	185	-	325	225	-	225	1000	-	0	785	-	785
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	73	73	73	98	98	98	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	122	121	23	197	51	203	338	33	70	524	89
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1549	1441	524	1574	1497	338	613	0	0	371	0	0
Stage 1	664	664	-	744	744	-	-	-	-	-	-	-
Stage 2	885	777	-	830	753	-	-	-	-	-	-	-
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	93	133	553	89	~ 123	704	966	-	-	1188	-	-
Stage 1	450	458	-	407	421	-	-	-	-	-	-	-
Stage 2	340	407	-	364	417	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 99	553	-	~ 91	704	966	-	-	1188	-	-
Mov Cap-2 Maneuver	-	~ 99	-	-	~ 91	-	-	-	-	-	-	-
Stage 1	356	431	-	322	333	-	-	-	-	-	-	-
Stage 2	102	322	-	192	392	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s							3.4			0.8		
HCM LOS												
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	966	-	-	-	99	553	-	91	704	1188	-	-
HCM Lane V/C Ratio	0.21	-	-	-	1.235	0.219	-	2.168	0.072	0.059	-	-
HCM Control Delay (s)	9.7	-	-	-	245.8	13.3	-	635.3	10.5	8.2	-	-
HCM Lane LOS	A	-	-	-	F	B	-	F	B	A	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-	8.4	0.8	-	17.5	0.2	0.2	-	-
Notes												
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon												

Intersection												
Int Delay, s/veh	27.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Vol, veh/h	59	66	13	13	155	235	20	214	15	124	126	32
Future Vol, veh/h	59	66	13	13	155	235	20	214	15	124	126	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	96	96	96	100	100	100	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	67	75	15	14	161	245	20	214	15	148	150	38
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	930	734	169	772	746	222	188	0	0	229	0	0
Stage 1	465	465	-	262	262	-	-	-	-	-	-	-
Stage 2	465	269	-	510	484	-	-	-	-	-	-	-
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	248	347	875	317	342	818	1386	-	-	1339	-	-
Stage 1	578	563	-	743	691	-	-	-	-	-	-	-
Stage 2	578	687	-	546	552	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	89	299	875	226	294	818	1386	-	-	1339	-	-
Mov Cap-2 Maneuver	89	299	-	226	294	-	-	-	-	-	-	-
Stage 1	568	493	-	730	679	-	-	-	-	-	-	-
Stage 2	303	675	-	399	484	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	136.1			21.3			0.6			3.5		
HCM LOS	F			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	1386	-	-	154	287	818	1339	-	-			
HCM Lane V/C Ratio	0.014	-	-	1.018	0.61	0.299	0.11	-	-			
HCM Control Delay (s)	7.6	0	-	136.1	35.3	11.3	8	0	-			
HCM Lane LOS	A	A	-	F	E	B	A	A	-			
HCM 95th %tile Q(veh)	0	-	-	7.8	3.7	1.3	0.4	-	-			

Timings
33: US 24 & Stapleton Dr

2020 Background Traffic
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	129	183	3	64	15	106	242	1	35	500	39
Future Volume (vph)	37	129	183	3	64	15	106	242	1	35	500	39
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	77.8%	77.8%	77.8%	77.8%	77.8%	77.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	11.1	11.1	11.1	11.1	11.1	11.1	64.0	64.0	64.0	64.0	64.0	64.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.74	0.74	0.74	0.74	0.74	0.74
v/c Ratio	0.22	0.54	0.51	0.02	0.28	0.07	0.18	0.17	0.00	0.05	0.42	0.04
Control Delay	36.4	43.6	10.7	32.3	36.6	4.5	4.7	3.9	0.0	3.7	5.5	1.3
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	36.4	43.6	10.7	32.3	36.6	4.5	4.7	3.9	0.0	3.7	5.5	1.3
LOS	D	D	B	C	D	A	A	A	A	A	A	A
Approach Delay		25.6			30.5			4.2			5.1	
Approach LOS		C			C			A			A	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 86.1

Natural Cycle: 45

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 11.3





















Intersection LOS: B

Intersection Capacity Utilization 55.1%

ICU Level of Service B

























Analysis Period (min) 15

Splits and Phases: 33: US 24 & Stapleton Dr

											
70 s	70 s	70 s	20 s	20 s	20 s	70 s	70 s	70 s	20 s	20 s	20 s
											
70 s	70 s	70 s	20 s	20 s	20 s	70 s	70 s	70 s	20 s	20 s	20 s

Timings
33: US 24 & Stapleton Dr

2020 Background Traffic
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	121	120	17	144	37	199	331	32	62	466	79
Future Volume (vph)	21	121	120	17	144	37	199	331	32	62	466	79
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	77.8%	77.8%	77.8%	77.8%	77.8%	77.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	13.1	13.1	13.1	13.1	13.1	13.1	64.1	64.1	64.1	64.1	64.1	64.1
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.15	0.73	0.73	0.73	0.73	0.73	0.73
v/c Ratio	0.18	0.44	0.36	0.13	0.71	0.18	0.34	0.25	0.03	0.09	0.39	0.08
Control Delay	36.3	39.4	9.8	33.9	50.5	11.5	6.6	4.8	1.5	4.3	5.8	1.1
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	36.3	39.4	9.8	33.9	50.5	11.5	6.6	4.8	1.5	4.3	5.8	1.1
LOS	D	D	A	C	D	B	A	A	A	A	A	A
Approach Delay		25.6			41.8			5.3			5.1	
Approach LOS		C			D			A			A	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 88.2

Natural Cycle: 50

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 13.7

























Intersection LOS: B







Intersection Capacity Utilization 65.6%

ICU Level of Service C







Analysis Period (min) 15








Splits and Phases: 33: US 24 & Stapleton Dr







														
70 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s
														
70 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s





Intersection							
Int Delay, s/veh	11.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	4	528	470	3	5	29	
Future Vol, veh/h	4	528	470	3	5	29	
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	0	500	-	-	155	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	76	76	58	58	43	43	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	5	695	810	5	12	67	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1637	12	79	0	-	0	
Stage 1	12	-	-	-	-	-	
Stage 2	1625	-	-	-	-	-	
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	111	1069	1519	-	-	-	
Stage 1	1011	-	-	-	-	-	
Stage 2	177	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	52	1069	1519	-	-	-	
Mov Cap-2 Maneuver	52	-	-	-	-	-	
Stage 1	472	-	-	-	-	-	
Stage 2	177	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	14.9	10		0			
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1519	-	52	1069	-	-	
HCM Lane V/C Ratio	0.533	-	0.101	0.65	-	-	
HCM Control Delay (s)	10	-	81.9	14.4	-	-	
HCM Lane LOS	B	-	F	B	-	-	
HCM 95th %tile Q(veh)	3.3	-	0.3	5	-	-	













Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗		↗	↗	
Traffic Vol, veh/h	49	89	24	11	69	135	27	289	10	238	238	57
Future Vol, veh/h	49	89	24	11	69	135	27	289	10	238	238	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	180	-	-	405	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	71	71	71	60	60	60	79	76	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	135	36	15	97	190	45	482	17	301	313	72
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1675	1540	349	1618	1568	491	385	0	0	499	0	0
Stage 1	951	951	-	581	581	-	-	-	-	-	-	-
Stage 2	724	589	-	1037	987	-	-	-	-	-	-	-
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	76	~ 115	694	83	111	578	1173	-	-	1065	-	-
Stage 1	312	338	-	499	500	-	-	-	-	-	-	-
Stage 2	417	495	-	279	325	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 79	694	-	~ 77	578	1173	-	-	1065	-	-
Mov Cap-2 Maneuver	-	~ 79	-	-	~ 77	-	-	-	-	-	-	-
Stage 1	300	242	-	480	481	-	-	-	-	-	-	-
Stage 2	215	476	-	84	233	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s							0.7			4.3		
HCM LOS	-			-								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	1173	-	-	-	-	578	1065	-	-			
HCM Lane V/C Ratio	0.038	-	-	-	-	0.329	0.283	-	-			
HCM Control Delay (s)	8.2	-	-	-	-	14.3	9.7	-	-			
HCM Lane LOS	A	-	-	-	-	B	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-	-	-	1.4	1.2	-	-			
Notes												
~: Volume exceeds capacity	\$: Delay exceeds 300s			+: Computation Not Defined			*: All major volume in platoon					






Intersection							
Int Delay, s/veh	9.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	4	275	497	11	7	6	
Future Vol, veh/h	4	275	497	11	7	6	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	0	500	-	-	155	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	54	54	100	100	100	100	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	7	509	497	11	7	6	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1012	7	13	0	-	0	
Stage 1	7	-	-	-	-	-	
Stage 2	1005	-	-	-	-	-	
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	265	1075	1606	-	-	-	
Stage 1	1016	-	-	-	-	-	
Stage 2	354	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	183	1075	1606	-	-	-	
Mov Cap-2 Maneuver	183	-	-	-	-	-	
Stage 1	702	-	-	-	-	-	
Stage 2	354	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	11.5	8.1		0			
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1606	-	183	1075	-	-	
HCM Lane V/C Ratio	0.309	-	0.04	0.474	-	-	
HCM Control Delay (s)	8.2	-	25.5	11.3	-	-	
HCM Lane LOS	A	-	D	B	-	-	
HCM 95th %tile Q(veh)	1.3	-	0.1	2.6	-	-	







Intersection												
Int Delay, s/veh	25.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	59	66	13	13	155	235	20	214	15	124	126	32
Future Vol, veh/h	59	66	13	13	155	235	20	214	15	124	126	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	180	-	-	405	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	96	96	96	100	100	100	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	67	75	15	14	161	245	20	214	15	148	150	38
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	930	734	169	772	746	222	188	0	0	229	0	0
Stage 1	465	465	-	262	262	-	-	-	-	-	-	-
Stage 2	465	269	-	510	484	-	-	-	-	-	-	-
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	248	347	875	317	342	818	1386	-	-	1339	-	-
Stage 1	578	563	-	743	691	-	-	-	-	-	-	-
Stage 2	578	687	-	546	552	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	92	304	875	230	300	818	1386	-	-	1339	-	-
Mov Cap-2 Maneuver	92	304	-	230	300	-	-	-	-	-	-	-
Stage 1	570	501	-	733	681	-	-	-	-	-	-	-
Stage 2	305	677	-	406	491	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	127			20.8			0.6			3.5		
HCM LOS	F			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	1386	-	-	158	293	818	1339	-	-			
HCM Lane V/C Ratio	0.014	-	-	0.993	0.597	0.299	0.11	-	-			
HCM Control Delay (s)	7.6	-	-	127	34	11.3	8	-	-			
HCM Lane LOS	A	-	-	F	D	B	A	-	-			
HCM 95th %tile Q(veh)	0	-	-	7.6	3.6	1.3	0.4	-	-			





Intersection							
Int Delay, s/veh	2.2						
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Vol, veh/h	14	332	200	23	68	43	
Future Vol, veh/h	14	332	200	23	68	43	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	235	-	-	235	0	0	
Veh in Median Storage, #	-	0	0	-	0	-	
Grade, %	-	0	0	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	15	361	217	25	74	47	
Major/Minor	Major1		Major2		Minor2		
Conflicting Flow All	242	0	-	0	608	217	
Stage 1	-	-	-	-	217	-	
Stage 2	-	-	-	-	391	-	
Critical Hdwy	4.12	-	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1324	-	-	-	459	823	
Stage 1	-	-	-	-	819	-	
Stage 2	-	-	-	-	683	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1324	-	-	-	454	823	
Mov Cap-2 Maneuver	-	-	-	-	454	-	
Stage 1	-	-	-	-	810	-	
Stage 2	-	-	-	-	683	-	
Approach	EB		WB		SB		
HCM Control Delay, s	0.3		0		12.6		
HCM LOS					B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2	
Capacity (veh/h)	1324	-	-	-	454	823	
HCM Lane V/C Ratio	0.011	-	-	-	0.163	0.057	
HCM Control Delay (s)	7.8	-	-	-	14.5	9.6	
HCM Lane LOS	A	-	-	-	B	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.6	0.2	

Intersection							
Int Delay, s/veh	12.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	4	528	472	4	5	29	
Future Vol, veh/h	4	528	472	4	5	29	
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	0	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	76	76	58	58	43	43	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	5	695	814	7	12	67	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1681	46	79	0	-	0	
Stage 1	46	-	-	-	-	-	
Stage 2	1635	-	-	-	-	-	
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	104	1023	1519	-	-	-	
Stage 1	976	-	-	-	-	-	
Stage 2	175	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	48	1023	1519	-	-	-	
Mov Cap-2 Maneuver	48	-	-	-	-	-	
Stage 1	451	-	-	-	-	-	
Stage 2	175	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	16.2	10		0			
HCM LOS	C						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1519	-	48	1023	-	-	
HCM Lane V/C Ratio	0.536	-	0.11	0.679	-	-	
HCM Control Delay (s)	10.1	0	89	15.6	-	-	
HCM Lane LOS	B	A	F	C	-	-	
HCM 95th %tile Q(veh)	3.3	-	0.3	5.6	-	-	

Intersection												
Int Delay, s/veh	13.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	131	222	3	64	15	119	242	1	35	500	39
Future Vol, veh/h	39	131	222	3	64	15	119	242	1	35	500	39
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	185	-	325	225	-	225	1000	-	0	785	-	785
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	95	95	95	100	100	100	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	39	131	222	3	67	16	119	242	1	40	575	45
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1177	1136	575	1334	1180	242	620	0	0	243	0	0
Stage 1	655	655	-	480	480	-	-	-	-	-	-	-
Stage 2	522	481	-	854	700	-	-	-	-	-	-	-
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	168	202	518	131	190	797	960	-	-	1323	-	-
Stage 1	455	463	-	567	554	-	-	-	-	-	-	-
Stage 2	538	554	-	353	441	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	99	172	518	25	162	797	960	-	-	1323	-	-
Mov Cap-2 Maneuver	99	172	-	25	162	-	-	-	-	-	-	-
Stage 1	399	449	-	497	485	-	-	-	-	-	-	-
Stage 2	398	485	-	139	428	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	40.2			40.9			3.1			0.5		
HCM LOS	E			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	960	-	-	99	172	518	25	162	797	1323	-	-
HCM Lane V/C Ratio	0.124	-	-	0.394	0.762	0.429	0.126	0.416	0.02	0.03	-	-
HCM Control Delay (s)	9.3	-	-	63.2	72.5	17.1	168.8	42.2	9.6	7.8	-	-
HCM Lane LOS	A	-	-	F	F	C	F	E	A	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	1.6	4.9	2.1	0.4	1.8	0.1	0.1	-	-

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	94	24	23	82	139	27	289	14	239	238	57
Future Vol, veh/h	49	94	24	23	82	139	27	289	14	239	238	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	71	71	71	60	60	60	79	76	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	142	36	32	115	196	45	482	23	303	313	72
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1694	1550	349	1628	1575	494	385	0	0	505	0	0
Stage 1	955	955	-	584	584	-	-	-	-	-	-	-
Stage 2	739	595	-	1044	991	-	-	-	-	-	-	-
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	~ 73	~ 114	694	82	~ 110	575	1173	-	-	1060	-	-
Stage 1	310	337	-	498	498	-	-	-	-	-	-	-
Stage 2	409	492	-	277	324	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 68	694	-	~ 66	575	1173	-	-	1060	-	-
Mov Cap-2 Maneuver	-	~ 68	-	-	~ 66	-	-	-	-	-	-	-
Stage 1	293	213	-	471	471	-	-	-	-	-	-	-
Stage 2	193	465	-	55	205	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s							0.7			4.3		
HCM LOS	-			-								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	1173	-	-	-	-	575	1060	-	-			
HCM Lane V/C Ratio	0.038	-	-	-	-	0.34	0.285	-	-			
HCM Control Delay (s)	8.2	0	-	-	-	14.5	9.7	0	-			
HCM Lane LOS	A	A	-	-	-	B	A	A	-			
HCM 95th %tile Q(veh)	0.1	-	-	-	-	1.5	1.2	-	-			
Notes												
~: Volume exceeds capacity	\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon				






Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	189	396	75	45	28
Future Vol, veh/h	48	189	396	75	45	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	235	-	-	235	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	81	81	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	205	489	93	49	30
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	582	0	-	0	798	489
Stage 1	-	-	-	-	489	-
Stage 2	-	-	-	-	309	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	992	-	-	-	355	579
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	745	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	992	-	-	-	337	579
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	745	-
Approach	EB		WB		SB	
HCM Control Delay, s	1.8		0		15.2	
HCM LOS					C	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	992	-	-	-	337	579
HCM Lane V/C Ratio	0.053	-	-	-	0.145	0.053
HCM Control Delay (s)	8.8	-	-	-	17.5	11.6
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	0.2

Intersection						
Int Delay, s/veh	9.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	278	499	12	8	6
Future Vol, veh/h	4	278	499	12	8	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	515	499	12	8	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1021	11	14	0	-	0
Stage 1	11	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
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	262	1070	1604	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	180	1070	1604	-	-	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	695	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	8.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1604	-	180	1070	-	-
HCM Lane V/C Ratio	0.311	-	0.041	0.481	-	-
HCM Control Delay (s)	8.3	0	25.9	11.4	-	-
HCM Lane LOS	A	A	D	B	-	-
HCM 95th %tile Q(veh)	1.3	-	0.1	2.7	-	-

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↑	↔	↔	↑	↔	↔	↑	↔
Traffic Vol, veh/h	23	123	146	17	147	37	242	331	32	62	466	82
Future Vol, veh/h	23	123	146	17	147	37	242	331	32	62	466	82
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	185	-	325	225	-	225	1000	-	0	785	-	785
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	73	73	73	98	98	98	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	124	147	23	201	51	247	338	33	70	524	92
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1639	1529	524	1678	1588	338	616	0	0	371	0	0
Stage 1	664	664	-	832	832	-	-	-	-	-	-	-
Stage 2	975	865	-	846	756	-	-	-	-	-	-	-
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	80	~ 117	553	75	~ 108	704	964	-	-	1188	-	-
Stage 1	450	458	-	363	384	-	-	-	-	-	-	-
Stage 2	303	371	-	357	416	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 82	553	-	~ 76	704	964	-	-	1188	-	-
Mov Cap-2 Maneuver	-	~ 82	-	-	~ 76	-	-	-	-	-	-	-
Stage 1	335	431	-	270	286	-	-	-	-	-	-	-
Stage 2	62	276	-	175	391	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s							4			0.8		
HCM LOS												
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	964	-	-	-	82	553	-	76	704	1188	-	-
HCM Lane V/C Ratio	0.256	-	-	-	1.515	0.267	-	2.65	0.072	0.059	-	-
HCM Control Delay (s)	10	-	-	-	\$ 373.1	13.9	-	\$ 864.3	10.5	8.2	-	-
HCM Lane LOS	B	-	-	-	F	B	-	F	B	A	-	-
HCM 95th %tile Q(veh)	1	-	-	-	10	1.1	-	19.5	0.2	0.2	-	-
Notes												
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon												

























HCM 2010 TWSC
35: Eastonville Rd & Stapleton Dr

2020 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	36.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	59	80	13	21	163	238	20	214	28	128	126	32
Future Vol, veh/h	59	80	13	21	163	238	20	214	28	128	126	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	96	96	96	100	100	100	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	67	91	15	22	170	248	20	214	28	152	150	38
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	950	755	169	794	760	228	188	0	0	242	0	0
Stage 1	473	473	-	268	268	-	-	-	-	-	-	-
Stage 2	477	282	-	526	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	240	338	875	306	336	811	1386	-	-	1324	-	-
Stage 1	572	558	-	738	687	-	-	-	-	-	-	-
Stage 2	569	678	-	535	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	80	289	875	204	288	811	1386	-	-	1324	-	-
Mov Cap-2 Maneuver	80	289	-	204	288	-	-	-	-	-	-	-
Stage 1	562	486	-	725	675	-	-	-	-	-	-	-
Stage 2	291	666	-	372	477	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	186			25.4			0.6			3.6		
HCM LOS	F			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1386	-	-	148 275 811	1324	-	-					
HCM Lane V/C Ratio	0.014	-	-	1.167 0.697 0.306	0.115	-	-					
HCM Control Delay (s)	7.6	0	-	186 43.5 11.4	8.1	0	-					
HCM Lane LOS	A	A	-	F E B	A	A	-					
HCM 95th %tile Q(veh)	0	-	-	9.7 4.7 1.3	0.4	-	-					

Timings 33: US 24 & Stapleton Dr

2020 Total Traffic
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	131	222	3	64	15	119	242	1	35	500	39
Future Volume (vph)	39	131	222	3	64	15	119	242	1	35	500	39
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	77.8%	77.8%	77.8%	77.8%	77.8%	77.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	11.1	11.1	11.1	11.1	11.1	11.1	64.1	64.1	64.1	64.1	64.1	64.1
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.74	0.74	0.74	0.74	0.74	0.74
v/c Ratio	0.23	0.55	0.56	0.02	0.28	0.07	0.21	0.17	0.00	0.05	0.42	0.04
Control Delay	36.6	43.8	10.8	32.3	36.5	4.5	4.9	4.0	0.0	3.7	5.5	1.3
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	36.6	43.8	10.8	32.3	36.5	4.5	4.9	4.0	0.0	3.7	5.5	1.3
LOS	D	D	B	C	D	A	A	A	A	A	A	A
Approach Delay		24.4			30.4			4.2			5.1	
Approach LOS		C			C			A			A	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 86.2

Natural Cycle: 45

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 11.4




Intersection LOS: B

Intersection Capacity Utilization 57.6%

ICU Level of Service B

















Analysis Period (min) 15

Splits and Phases: 33: US 24 & Stapleton Dr

 Ø2	 Ø4
70 s	20 s
 Ø6	 Ø8
70 s	20 s

Timings
35: Eastonville Rd & Stapleton Dr

2020 Total Traffic
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	49	94	23	82	139	27	289	239	238
Future Volume (vph)	49	94	23	82	139	27	289	239	238
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	70.0	70.0	70.0	70.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	77.8%	77.8%	77.8%	77.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effect Green (s)		15.6		15.6	15.6	24.7	24.7	24.7	24.7
Actuated g/C Ratio		0.31		0.31	0.31	0.49	0.49	0.49	0.49
v/c Ratio		0.51		0.29	0.31	0.09	0.60	0.95	0.43
Control Delay		23.2		19.5	5.5	6.2	11.5	52.4	8.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		23.2		19.5	5.5	6.2	11.5	52.4	8.3
LOS		C		B	A	A	B	D	A
Approach Delay		23.2		11.5			11.2		27.7
Approach LOS		C		B			B		C

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 50.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 19.1

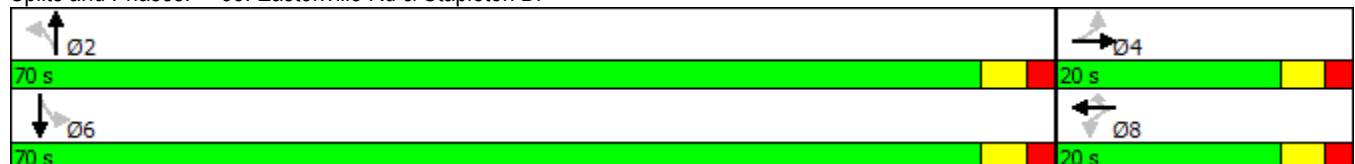
Intersection LOS: B

Intersection Capacity Utilization 59.6%

ICU Level of Service B

























Analysis Period (min) 15

Splits and Phases: 35: Eastonville Rd & Stapleton Dr



Timings 33: US 24 & Stapleton Dr

2020 Total Traffic
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	123	146	17	147	37	242	331	32	62	466	82
Future Volume (vph)	23	123	146	17	147	37	242	331	32	62	466	82
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	77.8%	77.8%	77.8%	77.8%	77.8%	77.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	13.3	13.3	13.3	13.3	13.3	13.3	64.0	64.0	64.0	64.0	64.0	64.0
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.15	0.72	0.72	0.72	0.72	0.72	0.72
v/c Ratio	0.20	0.44	0.40	0.13	0.72	0.18	0.42	0.25	0.03	0.09	0.39	0.08
Control Delay	36.9	39.4	9.6	33.9	50.9	11.5	7.7	4.9	1.5	4.3	5.9	1.1
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	36.9	39.4	9.6	33.9	50.9	11.5	7.7	4.9	1.5	4.3	5.9	1.1
LOS	D	D	A	C	D	B	A	A	A	A	A	A
Approach Delay		24.3			42.2			5.8			5.1	
Approach LOS		C			D			A			A	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 88.3

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 13.8













Intersection LOS: B

Intersection Capacity Utilization 68.2%

ICU Level of Service C

















Analysis Period (min) 15

Splits and Phases: 33: US 24 & Stapleton Dr

														
70 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s
70 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s	20 s

Timings
35: Eastonville Rd & Stapleton Dr

2020 Total Traffic
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	59	80	21	163	238	20	214	128	126
Future Volume (vph)	59	80	21	163	238	20	214	128	126
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		8	2		6	
Detector Phase	4	4	8	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	70.0	70.0	70.0	70.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	22.2%	77.8%	77.8%	77.8%	77.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	None	None	None
Act Effect Green (s)		14.0		14.0	14.0	10.1	10.1	10.1	10.1
Actuated g/C Ratio		0.41		0.41	0.41	0.30	0.30	0.30	0.30
v/c Ratio		0.28		0.26	0.31	0.05	0.47	0.46	0.34
Control Delay		8.8		8.6	2.8	8.7	12.2	14.8	9.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		8.8		8.6	2.8	8.7	12.2	14.8	9.4
LOS		A		A	A	A	B	B	A
Approach Delay		8.8		5.4			11.9		11.8
Approach LOS		A		A			B		B

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 34.2

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 9.1









Intersection LOS: A







Intersection Capacity Utilization 54.7%








ICU Level of Service A







Analysis Period (min) 15

Splits and Phases: 35: Eastonville Rd & Stapleton Dr

					
Ø2			Ø4		
70 s			20 s		
					
Ø6			Ø8		
70 s			20 s		








Intersection						
Int Delay, s/veh	11.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	528	472	4	5	29
Future Vol, veh/h	4	528	472	4	5	29
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	0	500	-	-	155
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	58	58	43	43
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	695	814	7	12	67
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1647	12	79	0	-	0
Stage 1	12	-	-	-	-	-
Stage 2	1635	-	-	-	-	-
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	109	1069	1519	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	175	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	51	1069	1519	-	-	-
Mov Cap-2 Maneuver	51	-	-	-	-	-
Stage 1	469	-	-	-	-	-
Stage 2	175	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.9	10		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1519	-	51	1069	-	-
HCM Lane V/C Ratio	0.536	-	0.103	0.65	-	-
HCM Control Delay (s)	10.1	-	83.6	14.4	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	3.3	-	0.3	5	-	-

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	94	24	23	82	139	27	289	14	239	238	57
Future Vol, veh/h	49	94	24	23	82	139	27	289	14	239	238	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	180	-	-	405	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	71	71	71	60	60	60	79	76	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	142	36	32	115	196	45	482	23	303	313	72
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1694	1550	349	1628	1575	494	385	0	0	505	0	0
Stage 1	955	955	-	584	584	-	-	-	-	-	-	-
Stage 2	739	595	-	1044	991	-	-	-	-	-	-	-
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	~ 73	~ 114	694	82	~ 110	575	1173	-	-	1060	-	-
Stage 1	310	337	-	498	498	-	-	-	-	-	-	-
Stage 2	409	492	-	277	324	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 78	694	-	~ 76	575	1173	-	-	1060	-	-
Mov Cap-2 Maneuver	-	~ 78	-	-	~ 76	-	-	-	-	-	-	-
Stage 1	298	241	-	479	479	-	-	-	-	-	-	-
Stage 2	197	473	-	77	231	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s							0.7			4.3		
HCM LOS	-			-								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	1173	-	-	-	-	575	1060	-	-			
HCM Lane V/C Ratio	0.038	-	-	-	-	0.34	0.285	-	-			
HCM Control Delay (s)	8.2	-	-	-	-	14.5	9.7	-	-			
HCM Lane LOS	A	-	-	-	-	B	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-	-	-	1.5	1.2	-	-			
Notes												
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon												

Intersection							
Int Delay, s/veh	9.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	4	278	499	12	8	6	
Future Vol, veh/h	4	278	499	12	8	6	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	0	500	-	-	155	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	54	54	100	100	100	100	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	7	515	499	12	8	6	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1018	8	14	0	-	0	
Stage 1	8	-	-	-	-	-	
Stage 2	1010	-	-	-	-	-	
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	263	1074	1604	-	-	-	
Stage 1	1015	-	-	-	-	-	
Stage 2	352	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	181	1074	1604	-	-	-	
Mov Cap-2 Maneuver	181	-	-	-	-	-	
Stage 1	699	-	-	-	-	-	
Stage 2	352	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	11.6	8.1		0			
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1604	-	181	1074	-	-	
HCM Lane V/C Ratio	0.311	-	0.041	0.479	-	-	
HCM Control Delay (s)	8.3	-	25.7	11.4	-	-	
HCM Lane LOS	A	-	D	B	-	-	
HCM 95th %tile Q(veh)	1.3	-	0.1	2.7	-	-	

HCM 2010 TWSC
35: Eastonville Rd & Stapleton Dr

2020 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	35.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	59	80	13	21	163	238	20	214	28	128	126	32
Future Vol, veh/h	59	80	13	21	163	238	20	214	28	128	126	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	250	180	-	-	405	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	96	96	96	100	100	100	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	67	91	15	22	170	248	20	214	28	152	150	38
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	950	755	169	794	760	228	188	0	0	242	0	0
Stage 1	473	473	-	268	268	-	-	-	-	-	-	-
Stage 2	477	282	-	526	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	240	338	875	306	336	811	1386	-	-	1324	-	-
Stage 1	572	558	-	738	687	-	-	-	-	-	-	-
Stage 2	569	678	-	535	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	82	295	875	208	293	811	1386	-	-	1324	-	-
Mov Cap-2 Maneuver	82	295	-	208	293	-	-	-	-	-	-	-
Stage 1	564	494	-	728	677	-	-	-	-	-	-	-
Stage 2	292	669	-	380	485	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	176.6			24.6			0.6			3.6		
HCM LOS	F			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	1386	-	-	151	280	811	1324	-	-			
HCM Lane V/C Ratio	0.014	-	-	1.144	0.685	0.306	0.115	-	-			
HCM Control Delay (s)	7.6	-	-	176.6	41.7	11.4	8.1	-	-			
HCM Lane LOS	A	-	-	F	E	B	A	-	-			
HCM 95th %tile Q(veh)	0	-	-	9.5	4.6	1.3	0.4	-	-			