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Paint Brush Hills Filings 14 and 15
PCD File No.: P185
Traffic Impact Analysis
(LSC #184630)
October 24, 2018


Traffic Engineer's Statement

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



Developer's Statement

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



10/24/18
Date



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October 24, 2018

Mr. Jeff Mark
The Landhuis Company
212 North Wahsatch Avenue, Suite 301
Colorado Springs, CO 80903

RE: Paint Brush Hills Filings 14 and 15
PCD File No: P185
El Paso County, Colorado
Traffic Impact Analysis
LSC #184630

Dear Mr. Mark:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the proposed Paint Brush Hills Filings 14 and 15 residential development in El Paso County, Colorado. As shown in Figure 1, the site is located north-northwest of the Londonderry Drive/Rockingham Drive intersection in unincorporated El Paso County.

REPORT CONTENTS

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

- Existing street conditions.
- Projections of short-term (2023) and long-term (2040) baseline/background traffic volumes.
- 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 and long term and the resulting total traffic volumes for the short and long term.
- The resulting traffic impacts including level of service analysis at key intersections and average daily traffic volumes on key street sections in the vicinity of the site.
- Recommended classification for all subdivision streets.
- Recommended lane configuration for the site access points to Londonderry Drive.

PREVIOUS TRAFFIC IMPACT STUDIES

LSC has completed the following traffic studies for Paint Brush Hills (previously Falcon Hills):

- **Falcon Hills Traffic Impact Study** - April 8, 2004: This study included analysis of all of the vacant areas west of Meridian Road and north of Stapleton Drive. Since completion of that report, Falcon Middle School has been completed on the parcel shown as “Falcon High School” in the 2004 report. An elementary school will be constructed in this area; however, it will be placed just north of Falcon Middle School rather than northwest of the north Londonderry Drive/Towner intersection. The key tables and figures from that report have been attached for reference.
- **Paint Brush Hills Filing 13A** - May 14, 2014: The 17 single-family homes in Filing 13A located south of Londonderry Drive and east of Towner Avenue have all been constructed since completion of this report.
- **Paint Brush Hills Filing 13B** - March 26, 2014: This report assumed lots for 21 single-family homes to be located north of Londonderry Drive and west of Towner Avenue. This is the same number of units as assumed for this area in the 2004 overall study. Some of the lots in this filing are currently under construction but none are currently occupied.
- **Scenic View at Paint Brush Hills** - April 7, 2014: This report assumed lots for 90 single-family homes northeast of the intersection of Stapleton Drive and Towner Avenue. Since completion of that report all of the homes have been built in the Scenic View development.
- **Paint Brush Hills Filings 13C-13F** - September 25, 2014: This report was superseded by the Paint Brush Hills Filings 13C and 13D report described below.
- **Paint Brush Hills Filings 13C and 13D** - January 9, 2017: This report assumed lots for 232 single-family homes west of Towner Avenue between the north and south portions of Londonderry Drive. Some of the lots within these filings are currently under construction but none are currently occupied.
- **D-49 Elementary School** - May 30, 2017: This report analyzed an elementary school to be located southeast of the north intersection of Londonderry Drive and Towner Avenue. At buildout the school will support up to 900 students.
- **Paint Brush Hills Filing 13E** – September 28, 2018: This report assumed 158 single-family homes east of the currently proposed Paint Brush Hills Filings 14 and 15.

Table 1 contains a summary of the land uses assumed for the areas west of Meridian Road and north of Stapleton Drive in the 2004 report and the latest traffic impact study completed by LSC in the area (D-49 Elementary School). Figure 2 shows the site plan and traffic analysis zones (TAZ) assumed in the 2004 study. Figure 3 shows the site plan.

LAND USE AND ACCESS

Figure 2 shows the currently existing, approved, and currently proposed developments in the areas west of Meridian Road and north of Stapleton Drive. The currently proposed Paint Brush Hills Filings 14 and 15 are located in the northwest corner of the development. There are existing single-family homes north, west, and south of the site. The currently vacant area east of the site is planned to contain 158 lots for single-family homes to be platted as Paint Brush Hills Filing 13E.

Filings 14 and 15 are planned to contain 224 single-family homes. Access is proposed via an extension of Keating Drive north of Rockingham Drive and through Paint Brush Hills Filing 13E to an intersection with Londonderry Drive aligning with Devoncove Drive.

The Paint Brush Hills Filings 14 and 15 area was included as part of TAZ 11 in the 2004 overall TIA. As shown in Table 1 the currently proposed plan for these filings includes about 114 more lots in this area than was assumed in the 2004 overall TIA. Including other changes to the residential land uses within Paint Brush Hills made since completion of the 2004 report, the total number of dwelling units within the entire study area represents an increase of 14 dwelling units.

Changes have also been made to the commercial and educational land uses within the Paint Brush Hills development. The 2004 overall TIA included 93 lots for single-family homes and an elementary school in TAZ 12. The school site is now located southeast of the north intersection of Towner Avenue and Londonderry Drive and the newly constructed Bennett Ranch Elementary School is now open. The 2004 study included 8.8 acres on the north end of Towner Avenue that were assumed to be developed as a "shopping center" with 85,000 square feet of floor space. A 2.2-acre portion of this area is now included in the D-49 elementary school site and it is now thought that the remaining six acres will most likely be developed with a lower intensity land use such as a church with a daycare. The 2004 study assumed a high school with about 700 students and an elementary school with 500 students. Since completion of that study, Falcon Middle School was relocated to the former Falcon High School campus. The middle school current enrollment is about 900 students. The new Bennett Ranch Elementary School is planned to serve up to 900 students.

Sight Distance

Figure 4 shows the sight distance analysis for the existing intersection of Rockingham Drive/Londonderry Drive and the future intersection that will align with Devoncove Drive/Londonderry Drive. Based on the design speed of 40 miles per hour, the required intersection sight distance at these intersections is 445 feet and the required stopping sight distance for westbound traffic on Londonderry Drive is 305 feet. As shown on the figure there is adequate sight distance for both of these intersections.

Pedestrian and Bicycle Route Analysis

Figure 5 shows a pedestrian and bicycle route analysis for the school. There are currently no sidewalks adjacent to Londonderry Drive. Sidewalks may need to be constructed on the north side of Londonderry Drive from Rockingham Drive to the school crossing for Bennett Ranch Elementary School just west of Tottenham Court. A designated school pedestrian crossing should be added on the west leg of the Londonderry/Towner intersection or the west leg of the east site access to Londonderry.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

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

- **Londonderry Drive** is a two-lane Urban Residential Collector that currently extends west from Eastonville Road to Towner Avenue and then loops to the south to intersect Towner Avenue again about one-half mile to the south. The posted speed limit adjacent to the site is 35 miles per hour (mph).
- **Meridian Road** extends north from South Blaney Road to County Line Road. Meridian Road is shown as a four-lane Minor Arterial south of Rex Road and north of Stapleton Drive and a two-lane Minor Arterial north of Rex Road on the *El Paso County Major Transportation Corridors Plan (MTCP)* and *El Paso County Corridor Preservation Plan (CPP)*. Meridian has been upgraded to four lanes between Stapleton and Indian Paint Trail with a PPRTA project.
- **Stapleton Drive** is classified as a four-lane Urban Principal Arterial on the El Paso County MTCP. However, Stapleton Drive in the vicinity of the site is a two-lane roadway. Stapleton Drive extends east from just west of Towner Drive across US Highway 24 to Curtis Road. Longer-term plans show Stapleton extended west to connect with Briargate.
- **Towner Avenue** is a 40-foot-wide Urban Residential Collector street (within Paint Brush Hills) that extends south from Londonderry Drive to just south of Woodmen Hills Drive. The posted speed limit is 35 miles per hour.
- **Keating Drive** is a north/south local street that serves Paint Brush Hills Filing 11 in the southwest area of the Paint Brush Hills development. Keating Drive is planned to be extended north to serve Filing 13E and Filings 14 and 15.
- **Devoncove Drive** is a planned north/south local street that will serve Paint Brush Hills Filing 13D located on the inside of the west Londonderry Loop. Devoncove Drive is planned to be extended north of Londonderry Drive through Paint Brush Hills Filings 14 and 15 and connecting to Paint Brush Hills Filing 13E.

Existing Traffic

Figure 6 shows the recent traffic volumes at the intersections of Londonderry Drive and Towner Avenue (north and south) and Stapleton Drive and Towner Avenue. These traffic volumes are based on traffic counts conducted by LSC in May and September 2018. The traffic count reports are attached.

Existing Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from “A” to “F.” LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 2 shows the level of service delay ranges.

Table 2			
Intersection Levels of Service Delay Ranges			
Level of Service	Signalized Intersections		Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	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: *Transportation Research Circular 212*
 (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.

The intersections of Londonderry Drive and Towner Avenue (north and south intersections) and Stapleton Drive and Towner Avenue were analyzed to determine the existing levels of service using the unsignalized method of analysis procedures outlined in the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. Figure 6 shows the level of service analysis results. As shown on the figure, all movements these intersections are level of service C or better during the peak hours. The level of service (LOS) reports are attached.

TRIP GENERATION

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE).

Table 3 shows a comparison of the trip generation estimates for the portion of the Paint Brush Hills development served by Londonderry Drive from the *Falcon Hills Traffic Impact Analysis* by LSC dated April 8, 2004, a trip generation estimate for those same areas assumed in the *D-49 Elementary School Traffic Impact Analysis* by LSC dated May 30, 2017 and an estimate based on the existing, approved, currently proposed and future land uses for this area. As shown on the table the current trip generation estimate is much lower than the estimate assumed in the *Falcon Hills Traffic Impact Analysis*. The largest differences are due to the land use assumptions for the commercial parcel located southwest of the Towner/Londonderry (north) intersection. The current trip generation estimate shows about 935 more vehicles per day than the estimate assumed in the D49 Elementary School report. This increase is due to a currently proposed increase in the number of lots for Filing 14 located just west of the site.

Table 4 shows the trip generation estimate for Filings 14 and 15 only. Filings 14 and 15 are expected to generate about 2,115 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 41 vehicles would enter and 124 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 140 vehicles would enter and 82 vehicles would exit the site.

BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the area streets and roadways without consideration of the proposed development. Figure 7 shows the projected background traffic volumes for the short term (2023). These background traffic volumes were based on estimates of traffic projected to be generated (or currently generated) by Paint Brush Hills Filing 4 through Filing 13E, Scenic View at Paint Brush Hills, Falcon Middle School, and the recently opened D49 elementary school. The traffic volumes for the developments not yet built out were taken from their respective traffic studies completed by LSC. The short-term scenario assumes Stapleton Drive not yet extended west from its current terminus.

Figure 8 shows the projected 2040 background traffic volumes. These volumes assume buildout of the Paint Brush Hills development. The 2040 background traffic volumes also assume Stapleton Drive has been extended west. Although future background volumes are often estimated using growth rates, this method is not applicable for this study. Only traffic generated by uses within the Paint Brush Hills development are anticipated to use Towner Drive north of Stapleton Drive and Londonderry Drive west of Towner Drive. Future traffic using these streets was estimated by first adjusting the existing traffic volumes to reroute them to new paths following the extension of Stapleton Drive to the east and second adding estimates of future traffic to be generated by buildout of parcels within Paint Brush Hills. Estimates of future traffic has been based on the trip

generation estimate shown in Table 3. A growth factor is also not able to be applied to Stapleton Drive as it currently terminates at Towner Avenue. Through traffic on Stapleton Drive has been estimated by LSC based on traffic studies completed in the area and the current *Major Transportation Corridors Plan*.

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 9 shows the short-term and long-term external directional distribution estimates for the site-generated traffic volumes. The estimates have been based on the following factors: the site's location with respect to the nearby employment, commercial, schools, and activity centers and the balance of the Falcon and Colorado Springs metropolitan area; the site's proposed land use; the site's proposed access points; and the phasing of the existing and future roadway system serving the site. The long-term distribution takes into account the extension of Stapleton west to Briargate Parkway.

SITE-GENERATED TRAFFIC

Figures 10 and 11 show the projected short-term and long-term site-generated traffic volumes, respectively. The site-generated traffic volumes were calculated by applying the directional distribution percentages (from Figure 9) to the trip generation estimates from Table 4.

TOTAL TRAFFIC

Figure 12 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 7) plus the short-term site-generated traffic volumes from Figure 10.

Figure 13 shows the projected 2040 total traffic volumes. The 2040 total traffic volumes are the sum of the 2040 background traffic volumes (from Figure 8) plus the long-term site-generated traffic volumes from Figure 11.

PROJECTED LEVELS OF SERVICE

The key area intersections were analyzed to determine the projected levels of service for the background and total traffic volumes based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. Figures 7, 8, 12, and 13 show the level of service analysis results. The level of service reports are attached.

Towner/Stapleton

The intersection of Towner/Stapleton is currently all-way Stop-sign controlled. All movements at this intersection are projected to operate at LOS B or better during peak hours based on the projected short-term total traffic volumes. By 2040 it was assumed that Stapleton Drive would

be extended west as Briargate Parkway and this intersection would become four-way signal controlled. As a signalized intersection all movements are projected to operate at LOS D or better for all movements during the peak hours.

Towner/Londonderry

All movements at the north and south intersections of Towner/Londonderry are projected to operate at LOS D or better during the peak hours based on the projected short-term and 2040 total traffic volumes.

Londonderry Intersections

All of the site access intersections to Londonderry Drive are projected to operate at LOS B or better for all movements based on the projected short-term and 2040 total traffic volumes as two-way stop-sign-controlled intersections.

STREET CLASSIFICATIONS

All of the Paint Brush Hills Filings 14 and 15 internal streets should be classified as Urban Local.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- Filings 14 and 15 are expected to generate about 2,115 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 41 vehicles would enter and 124 vehicles would exit the site. During the afternoon peak hour about 140 vehicles would enter and 82 vehicles would exit the site.
- The current trip generation estimate for the overall Paint Brush Hills development is much lower than the estimate assumed in the *Falcon Hills Traffic Impact Analysis*. The largest differences are due to the land use assumptions for the commercial parcel located southwest of the Towner/Londonderry (north) intersection. The current trip generation estimate shows about 935 more vehicles per day than the estimate assumed in the D49 Elementary School report.

Street Link Average Daily Traffic (ADT)

- Londonderry Drive and Towner Avenue are both classified as Urban Residential Collector streets. The design ADT for an Urban Residential Collector is 10,000 vehicles per day. As shown in Figure 12 the projected buildout ADT on Londonderry Drive is about 4,015 vehicles per day just west of the north Towner Avenue intersection and 7,960 vehicles per day just east of that intersection. The projected buildout ADT on Towner Avenue is 5,175 just south

of the north intersection of Londonderry/Towner and 9,575 vehicles per day just north of Stapleton Drive.

Level of Service

- The intersection of Stapleton/Towner is currently all-way Stop-sign controlled. All movements at this intersection are projected to operate at LOS B or better during peak hours based on the projected short-term total traffic volumes. By 2040 it was assumed that Stapleton Drive would be extended west as Briargate Parkway and this intersection would become a four-way signal controlled. As a signalized intersection all movements are projected to operate at LOS D or better for all movements during the peak hours.
- All movements at the north and south intersections of Towner/Londonderry are projected to operate at LOS D or better during the peak hours based on the projected short-term total traffic volumes.
- The intersections of Rockingham Drive/Londonderry Drive and Devoncove Drive/Londonderry Drive are projected to operate at LOS B or better for all movements based on the projected short-term and 2040 total traffic volumes as two-way stop-sign-controlled intersections.

Intersection Lane Configurations

- Based on the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)* and the projected short-term and 2040 total traffic volumes, no auxiliary turn lanes would be required on Londonderry Drive approaching Devoncove Drive.
- Based on the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)* and the projected short-term total traffic volumes, a northbound left-turn lane would be required on Londonderry Drive approaching Rockingham Drive. Londonderry Drive is currently 40 feet wide in the vicinity of this intersection and could be restriped to provide a northbound left-turn lane, if necessary.
- Based on the criteria contain in the ECM and the projected 2040 total traffic volumes, a southbound right-turn deceleration lane would be required on Londonderry Drive approaching Rockingham Drive based on the projected right-turn volume. However, at this particular location, the westbound through volume is low and is projected to remain low at buildout. Although the ECM does not have a provision for waiving the need for a right-turn deceleration lane when the through traffic is below a certain level, the State of Colorado Highway Access code provides a waiver to right-turn lane requirements when the 20th year predicted volume in the travel lane is below 150 vehicles per hour. As the southbound traffic volume is projected to be only 77 vehicles per hour, LSC recommends that the requirement for a right-turn deceleration lane be waived. A deviation request form for this was submitted with Filing 13E on October 24, 2018.

Proposed Subdivision Street Classifications

- As shown in Figure 14 all proposed subdivision streets will be classified as Urban Local Low Volume or Urban Local streets. Note: The connecting street Keating Drive to the south is a Local street even though it has a 60-foot right-of-way width. It is our understanding that this older street was platted prior to the ECM Local street right-of-way criteria of 50-foot right-of-way widths plus two five-foot public improvement easements.

County Road Impact Fee

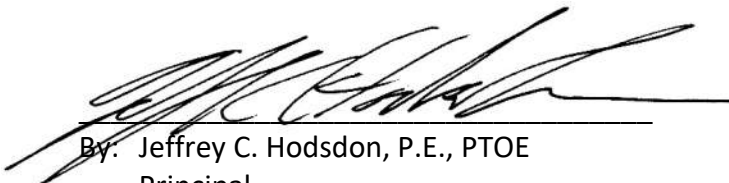
- The applicant will be required to participate in the County Road Impact Fee Program. Assuming this development joins the ten-mil PID, the building permit fee portion is \$923 per single-family dwelling unit. The net fee for the proposed 224 lots in Filings 14 and 15 would be \$206,752.

* * * * *

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 1, 3-4
Figures 1-14
Traffic Count Reports
Level of Service Reports
Key tables and figures from Falcon Hills Traffic Impact Study dated April 8, 2004

**Table 1
Paintbrush Hills Filings 14 & 15
Land Use Comparison**

Falcon Hills Traffic Impact Analysis April 8, 2004 Scenario 2				D-49 Elementary School Traffic Impact Analysis May 30, 2017				Existing, Approved, Currently Proposed or Future				Change					
Traffic Analysis Zone	Land Use	Quantity	Unit	Filing Name	Land Use	Quantity	Unit	Filing Name	Status	Land Use	Quantity	Unit	From 2004		From 2017		
													Quantity	Unit	Quantity	Unit	
1	Single-Family Detached Housing	194	DU ⁽¹⁾	Paintbrush Hills Fil 4	Single-Family Detached Housing	164	DU	Paintbrush Hills Fil 4	Built Out	Single-Family Detached Housing	164	DU	1	DU	0	DU	
				Paintbrush Hills Fil 5	Single-Family Detached Housing	31	DU	Paintbrush Hills Fil 5	Built Out	Single-Family Detached Housing	31	DU		DU	0	DU	
2	Single-Family Detached Housing	303	DU	Paintbrush Hills Fil 6	Single-Family Detached Housing	48	DU	Paintbrush Hills Fil 6	Built Out	Single-Family Detached Housing	48	DU	-2	DU	0	DU	
	Single-Family Detached Housing		DU	Paintbrush Hills Fil 7	Single-Family Detached Housing	57	DU	Paintbrush Hills Fil 7	Built Out	Single-Family Detached Housing	57	DU		DU	0	DU	
	Single-Family Detached Housing		DU	Paintbrush Hills Fil 8	Single-Family Detached Housing	108	DU	Paintbrush Hills Fil 8	Built Out	Single-Family Detached Housing	108	DU		DU	0	DU	
	Single-Family Detached Housing		DU	Paintbrush Hills Fil 9	Single-Family Detached Housing	88	DU	Paintbrush Hills Fil 9	Built Out	Single-Family Detached Housing	88	DU		DU	0	DU	
3	High School	706	Students	Falcon Middle School	Middle School	900	Students	Falcon Middle School	Built Out	Middle School	900	Students	---	---	---	---	
4	Single-Family Detached Housing	41	DU	Paintbrush Hills Fil 10 (East)	Single-Family Detached Housing	41	DU	Paintbrush Hills Fil 10 (East)	Built Out	Single-Family Detached Housing	41	DU	0	DU	0	DU	
5	Single-Family Detached Housing	181	DU	Paintbrush Hills Fil 10 (West)	Single-Family Detached Housing	49	DU	Paintbrush Hills Fil 10 (West)	Built Out	Single-Family Detached Housing	49	DU	-5	DU	0	DU	
			DU	Paintbrush Hills Fil 11	Single-Family Detached Housing	81	DU	Paintbrush Hills Fil 11	Built Out	Single-Family Detached Housing	81	DU		DU	0	DU	
			DU	Paintbrush Hills Fil 12	Single-Family Detached Housing	46	DU	Paintbrush Hills Fil 12	Built Out	Single-Family Detached Housing	46	DU		DU	0	DU	
6	Apartments	180	DU	Scenic View at Paintbrush Hills	Single-Family Detached Housing	89	DU	Scenic View at Paintbrush Hills	Built Out	Single-Family Detached Housing	89	DU	-91	DU	0	DU	
7	Single-Family Detached Housing	13	DU	---	---	---	---	---	---	---	---	---	-13	DU	---	DU	
8	Shopping Center (8.2 acres)	82	KSF ⁽²⁾	D-49 Elementary School	Elementary School	900	Students	D-49 Elementary School	Approved	Elementary School	900	Students	---	---	---	---	
	Future	---	---	Future	Church with Day Care	6	Acres	Future	Future	Church with Day Care	6	Acres	---	---	---	---	
	Single-Family Detached Housing	33	DU	Paintbrush Hills Fil 13A	Single-Family Detached Housing	17	DU	Paintbrush Hills Fil 13A	Built Out	Single-Family Detached Housing	17	DU	-16	DU	0	DU	
9	Single-Family Detached Housing	133	DU	Paintbrush Hills Fil 13B	Single-Family Detached Housing	21	DU	Paintbrush Hills Fil 13B	Under Construction	Single-Family Detached Housing	21	DU	23	DU	0	DU	
			DU	Paintbrush Hills Fil 13C	Single-Family Detached Housing	135	DU	Paintbrush Hills Fil 13C	Under Construction	Single-Family Detached Housing	135	DU		DU	0	DU	
10	Single-Family Detached Housing	102	DU	Paintbrush Hills Fil 13D	Single-Family Detached Housing	97	DU	Paintbrush Hills Fil 13D	Under Construction	Single-Family Detached Housing	97	DU	-5	DU	0	DU	
11	Single-Family Detached Housing	167	DU	Paintbrush Hills Fil 14 & 15	Single-Family Detached Housing	124	DU	Paintbrush Hills Fil 14 & 15	Under Review	Single-Family Detached Housing	224	DU	114	DU	100	DU	
			DU	Paint Brush Hills Fil 13E	Single-Family Detached Housing	57	DU	Paint Brush Hills Fil 13E	Proposed	Single-Family Detached Housing	57	DU		DU		DU	
12	Single-Family Detached Housing	93	DU	Paint Brush Hills Fil 13E	Single-Family Detached Housing	102	DU	Paint Brush Hills Fil 13E	Proposed	Single-Family Detached Housing	101	DU	8	DU	-1	DU	
	Elementary School	500	Students										---	---	---	---	
Total																	
Single-Family Detached Housing		1,260	DU	Single-Family Detached Housing		1,355	DU	Single-Family Detached Housing		1,454	DU	194	DU	99	DU		
Apartments		180	DU	Apartments		0	DU	Apartments		0	DU	-180	DU	0	DU		
Total Residential		1,440	DU	Total Residential		1,355	DU	Total Residential		1,454	DU	14	DU	99	DU		
Shopping Center		82	KSF	Shopping Center		0	KSF	Shopping Center		0	KSF	-82	KSF	0	KSF		
Church With Day Care		0	KSF	Church With Day Care		35	KSF	Church With Day Care		35	KSF	35	KSF	0	KSF		
School		1,206	Students	School		1,800	Students	School		1,800	Students	594	Students	0	Students		

Notes:
(1) DU = dwelling unit
(2) KSF = thousand square feet of floor area

Source: LSC Transportation Consultants, Inc.

**Table 3
Trip Generation Comparison
Paintbrush Hills Filings 14 & 15**

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	
Falcon Hills Traffic Impact Analysis April 8, 2004													
210	Single-Family Detached Housing	1260 DU ⁽²⁾	9.57	0.19	0.56	0.65	0.36	12,058	236	709	814	458	
220	Apartment	180 DU	6.74	0.08	0.43	0.43	0.21	1,213	15	78	78	38	
Total Residential								13,271	251	787	892	496	
820	Shopping Center	82 KSF ⁽³⁾	73.17	1.06	0.68	3.22	3.49	6,000	87	55	264	286	
Grand Total								32,543	589	1,629	2,048	1,278	
D-49 Elementary School Traffic Impact Analysis May 30, 2017													
210	Single-Family Detached Housing	1355 DU	9.44	0.19	0.56	0.62	0.37	12,791	251	752	845	496	
560	Church	30 KSF	6.71	0.20	0.13	0.23	0.28	201	6	4	7	8	
565	Day Care Center	5 KSF	74.06	6.46	5.72	5.80	6.54	370	32	29	29	33	
Total								13,363	289	785	881	537	
Existing, Approved, Currently Proposed or Future													
210	Single-Family Detached Housing	1454 DU	9.44	0.19	0.56	0.62	0.37	13,726	269	807	907	533	
560	Church	30 KSF	6.71	0.20	0.13	0.23	0.28	201	6	4	7	8	
565	Day Care Center	5 KSF	74.06	6.46	5.72	5.80	6.54	370	32	29	29	33	
Total								14,297	307	840	943	574	
Difference From 2004								-18,245	-282	-789	-1,105	-704	
Difference From 2017								935	18	55	62	36	

Notes:

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

(2) DU = dwelling unit

(3) KSF = thousand square feet of floor area

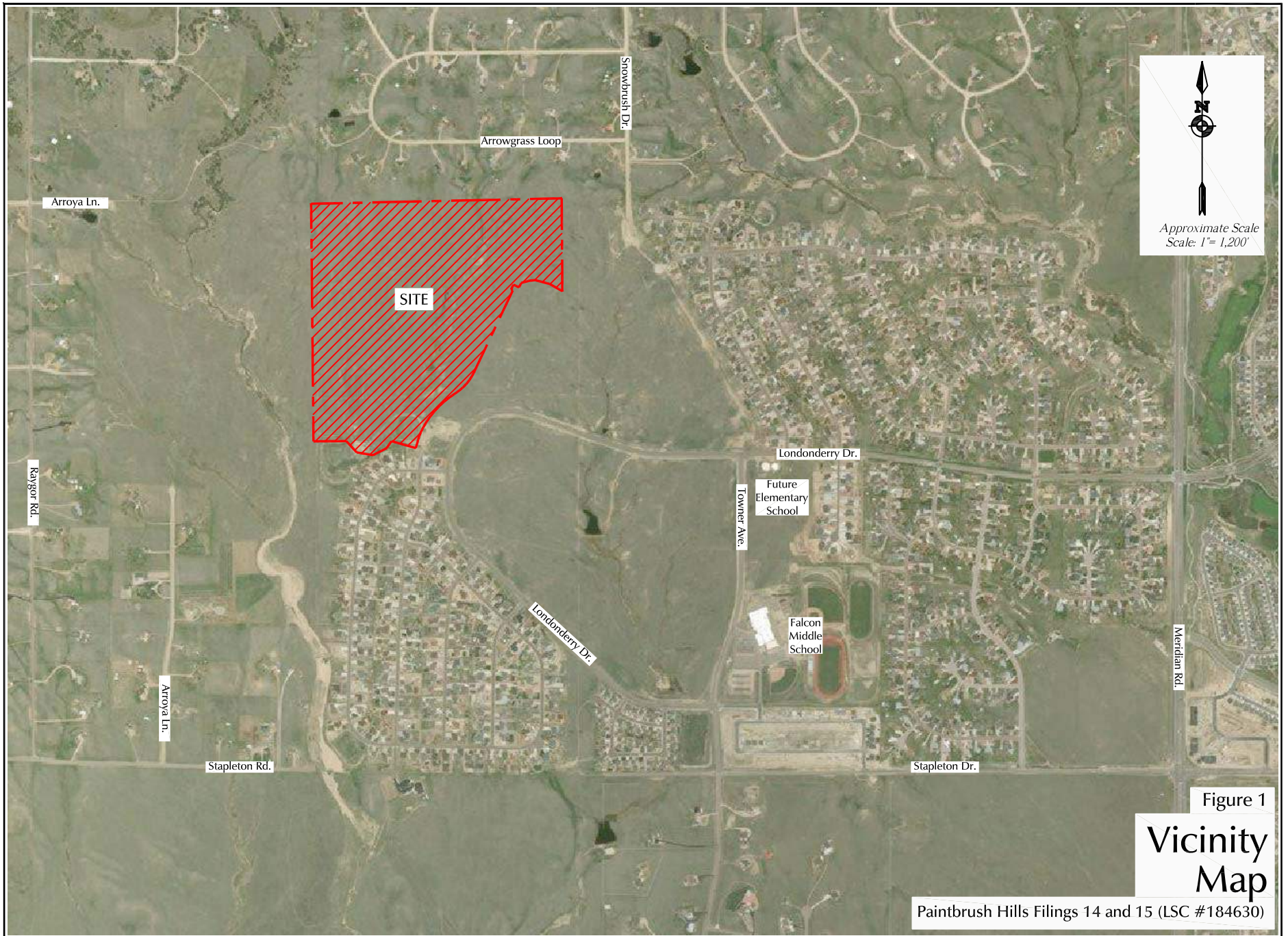
Source: LSC Transportation Consultants, Inc.

**Table 4
Trip Generation Estimate
Paintbrush Hills Filings 14 & 15**

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
210	Single-Family Detached Housing	224 DU ⁽²⁾	9.44	0.19	0.56	0.62	0.37	2,115	41	124	140	82

Notes:
(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)
(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.



Approximate Scale
Scale: 1" = 1,200'

Figure 1

Vicinity Map

Paintbrush Hills Filings 14 and 15 (LSC #184630)

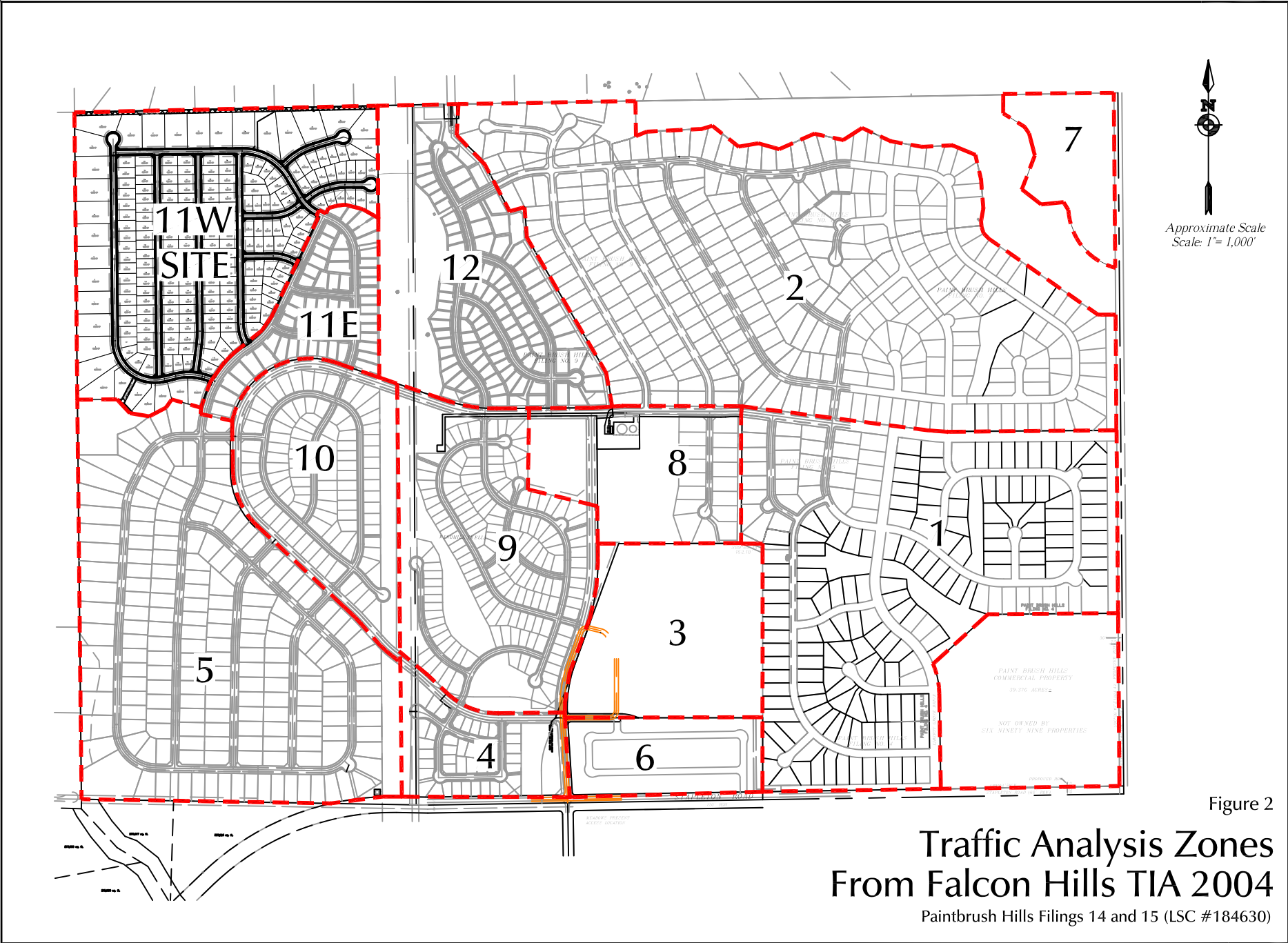


Figure 2
Traffic Analysis Zones
From Falcon Hills TIA 2004
 Paintbrush Hills Filings 14 and 15 (LSC #184630)



Proposed
Filings 14 & 15

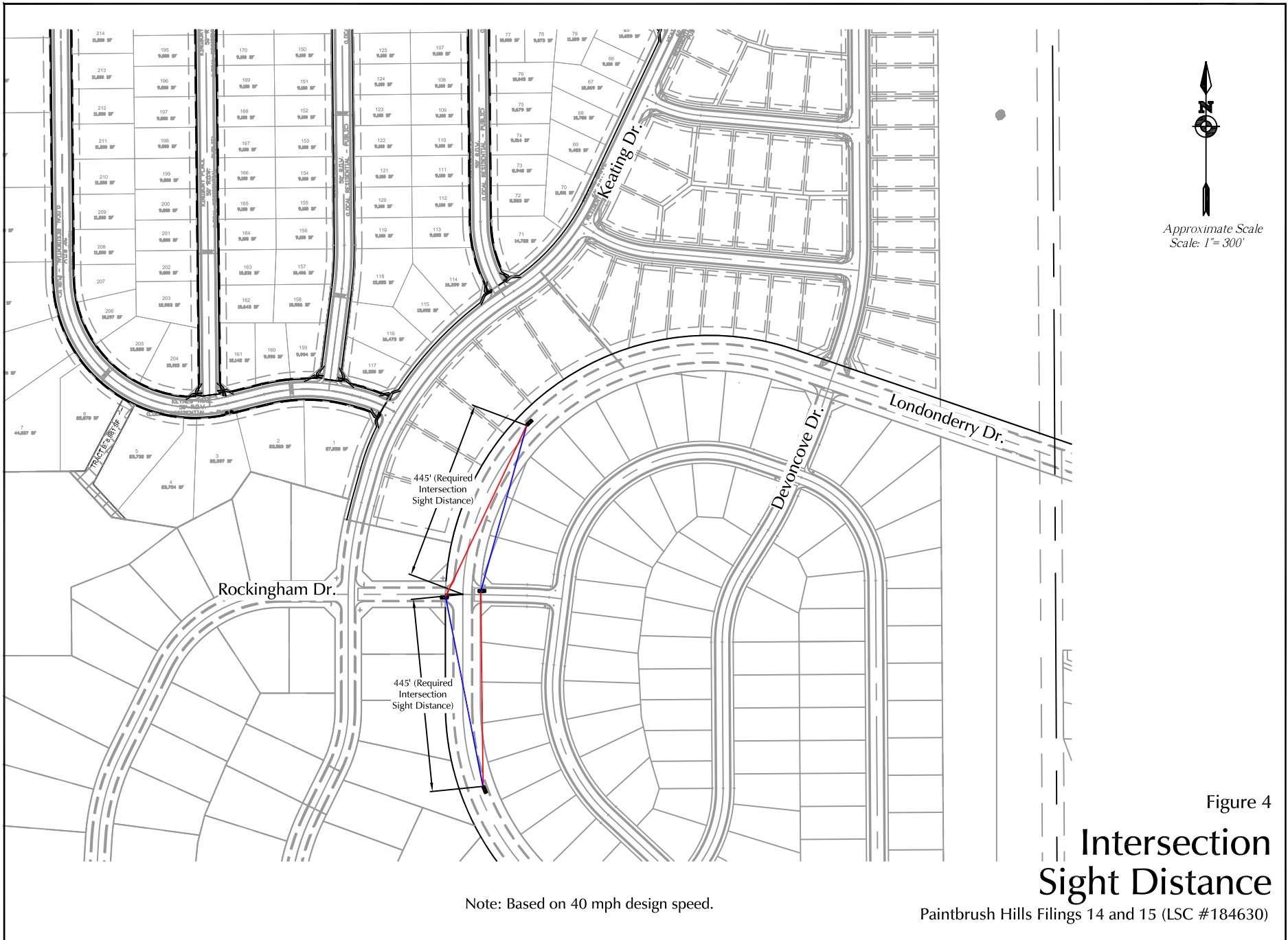
Proposed
• Filing 13E

Approximate Scale
Scale: 1" = 400'

PAINT BRUSH HILLS
FILING NO. 9

Figure 3
Site
Plan

Paintbrush Hills Filings 14 and 15 (LSC #184630)



Approximate Scale
Scale: 1" = 300'

Figure 4
**Intersection
Sight Distance**

Note: Based on 40 mph design speed.

Paintbrush Hills Filings 14 and 15 (LSC #184630)



Approximate Scale
Scale: 1" = 300'

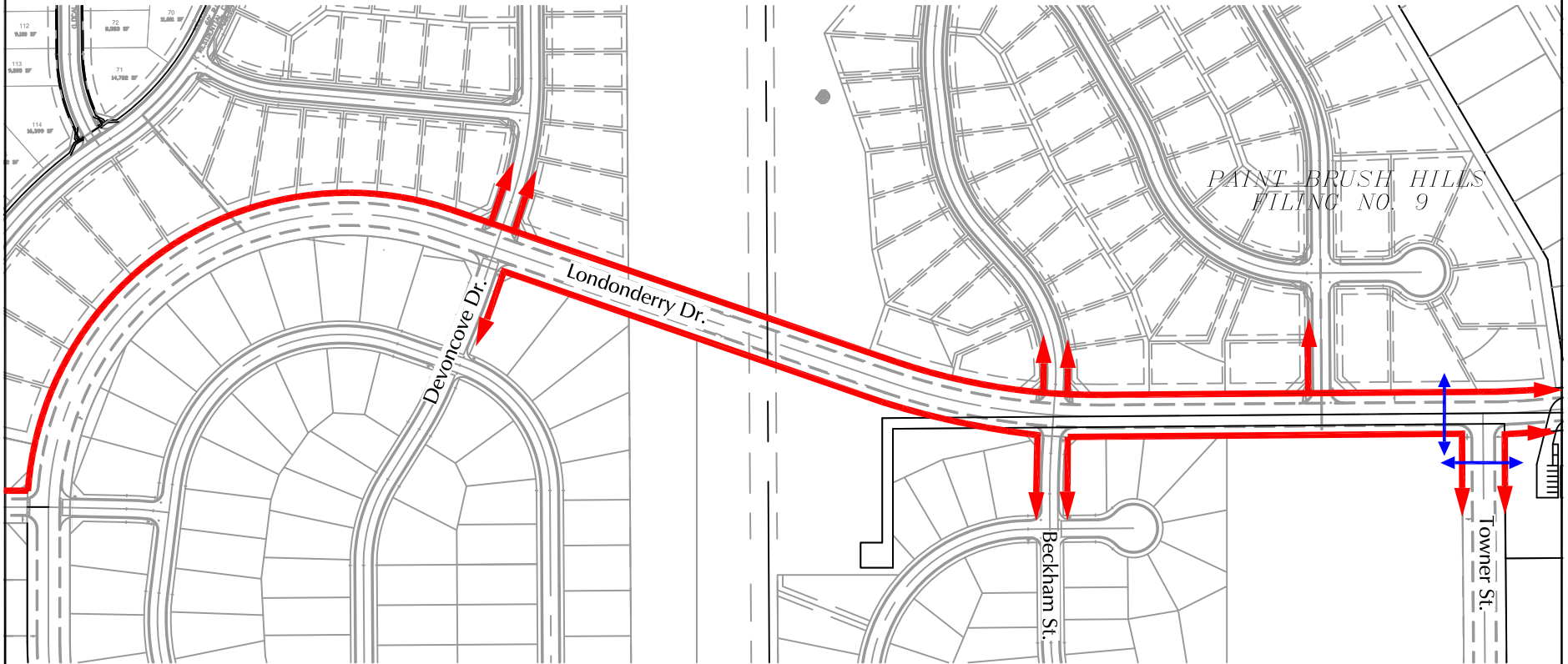




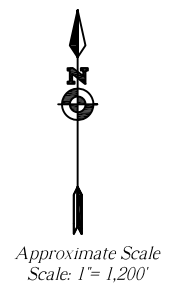
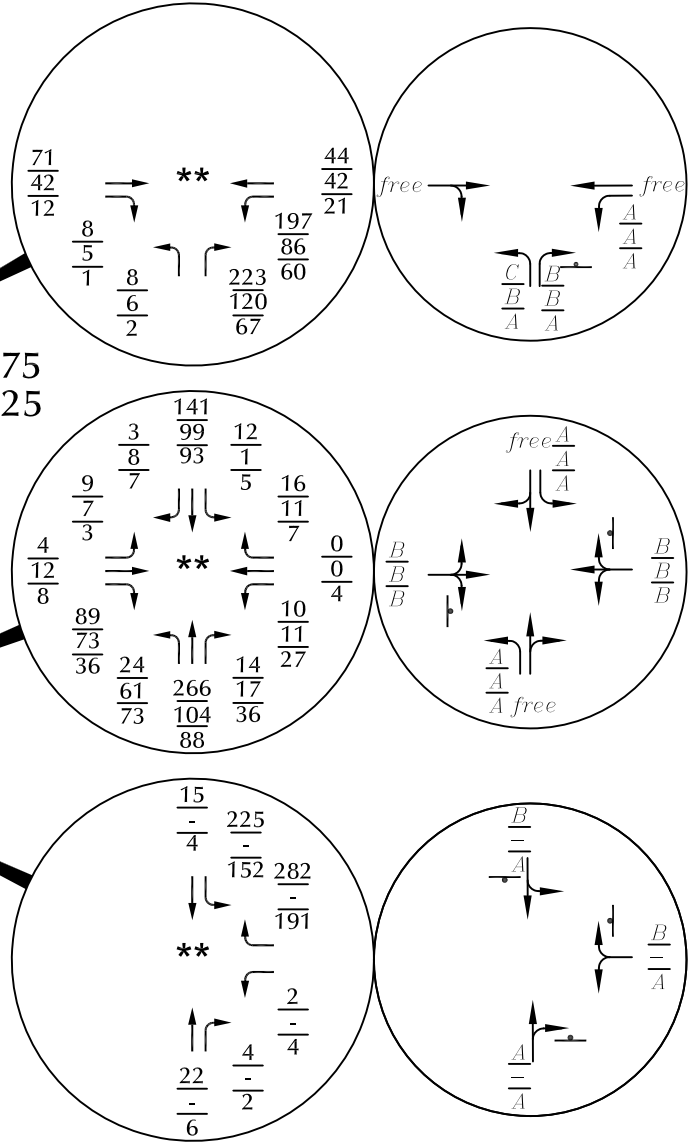
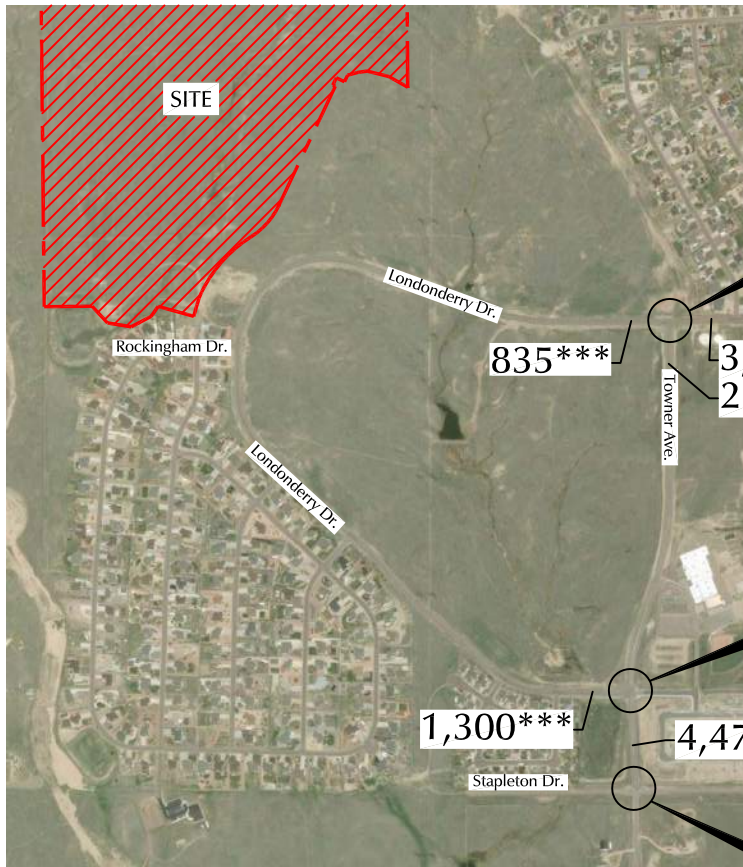
Figure 5

LEGEND:

-  = School Crossing
-  = School Route

School Pedestrian and Bicycle Routes

Paintbrush Hills Filings 14 and 15 (LSC #184630)



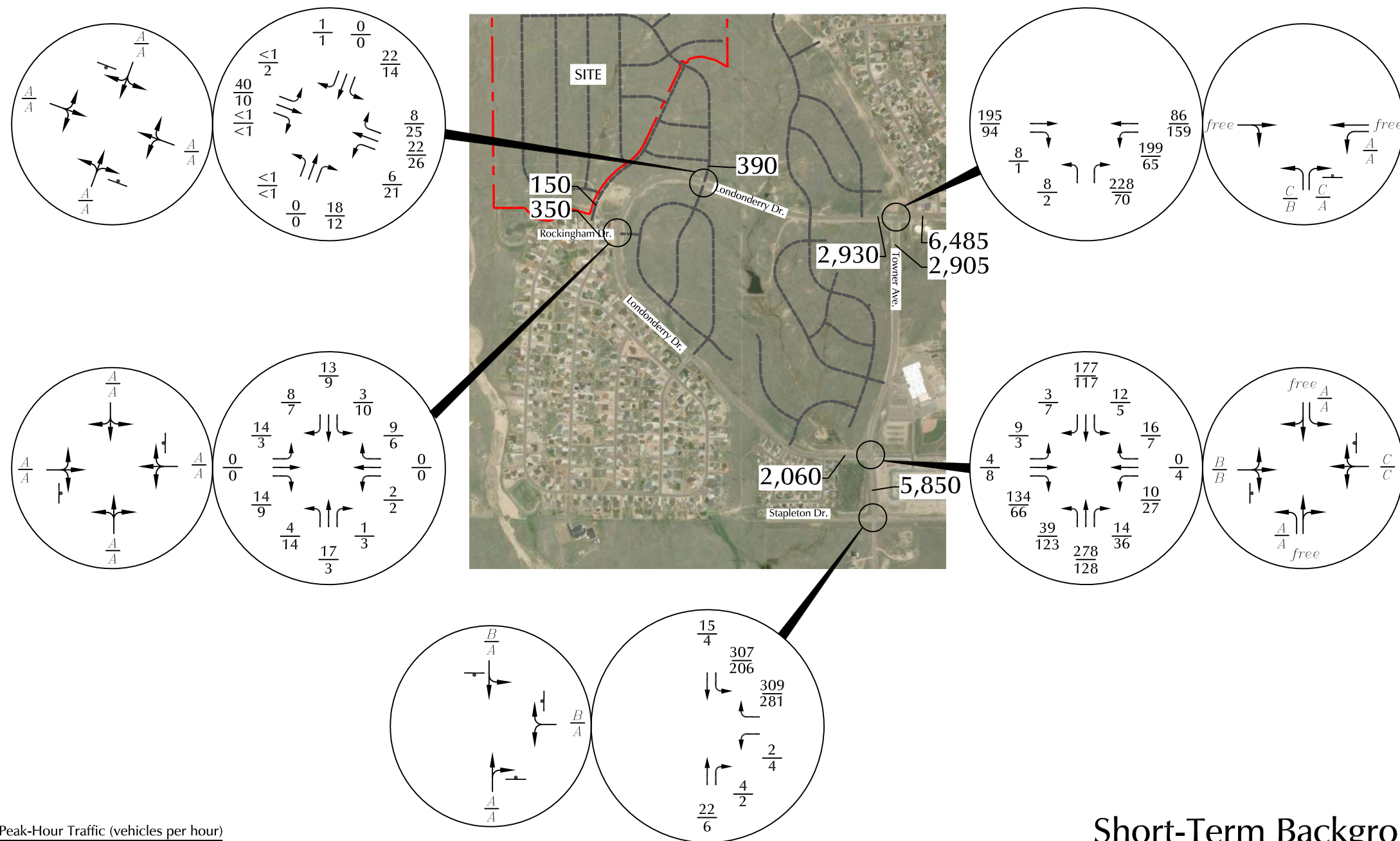
* May 2018
 ** Sept 2018
 *** Estimate by LSC

LEGEND:
 | = Stop Sign
 $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = Midday (2:30-3:30pm) Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service
 $\frac{A}{A}$ = Midday (2:30-3:30pm) Individual Movement Peak-Hour Level of Service
 $\frac{C}{C}$ = PM Individual Movement Peak-Hour Level of Service
 X,XXX = Annual Average Daily Traffic (vehicles per day) = (CDOT 2016)

Figure 6
**Existing Traffic, Lane Geometry,
 Traffic Control and Level of Service**
 Paintbrush Hills Filings 14 and 15 (LSC #184630)



Approximate Scale
Scale: 1"= 1,200'

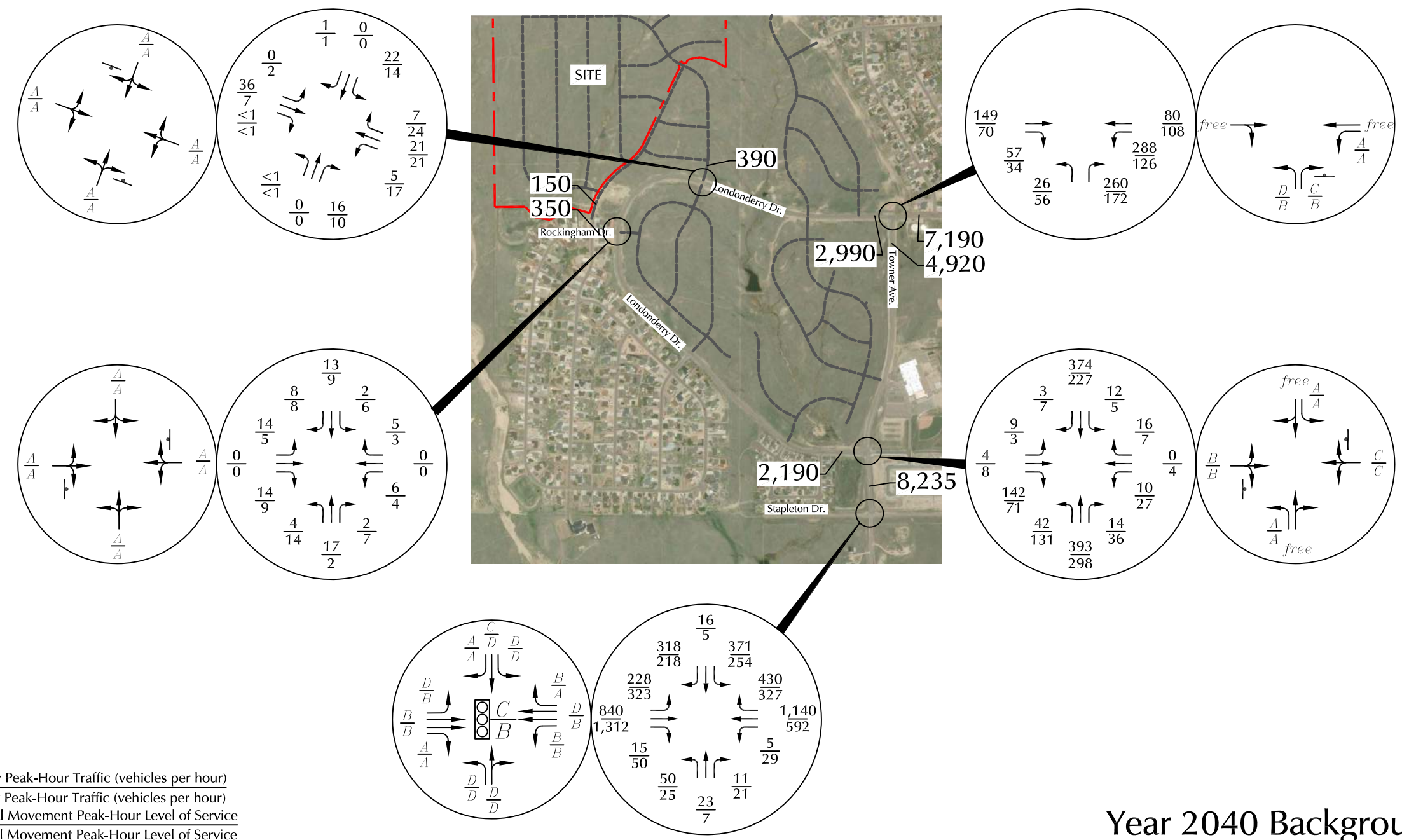
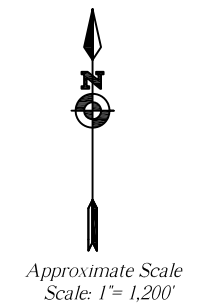


LEGEND:

- = Stop Sign
- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
PM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service
PM Individual Movement Peak-Hour Level of Service
- X,XXX= Average Weekday Traffic (vehicles per day)



Figure 7
Short-Term Background Traffic, Lane Geometry, Traffic Control and Level of Service
Paintbrush Hills Filings 14 and 15 (LSC #184630)

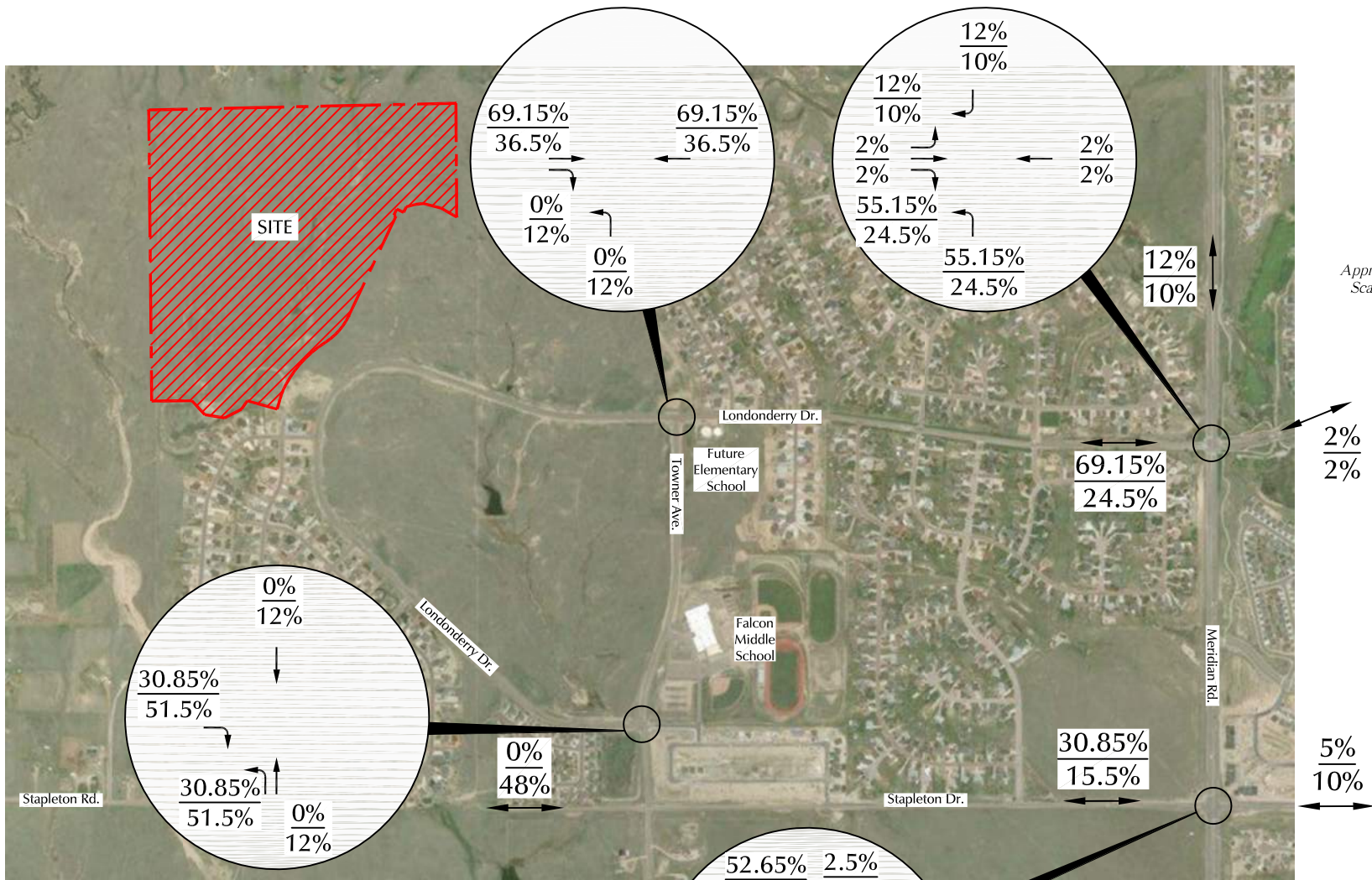


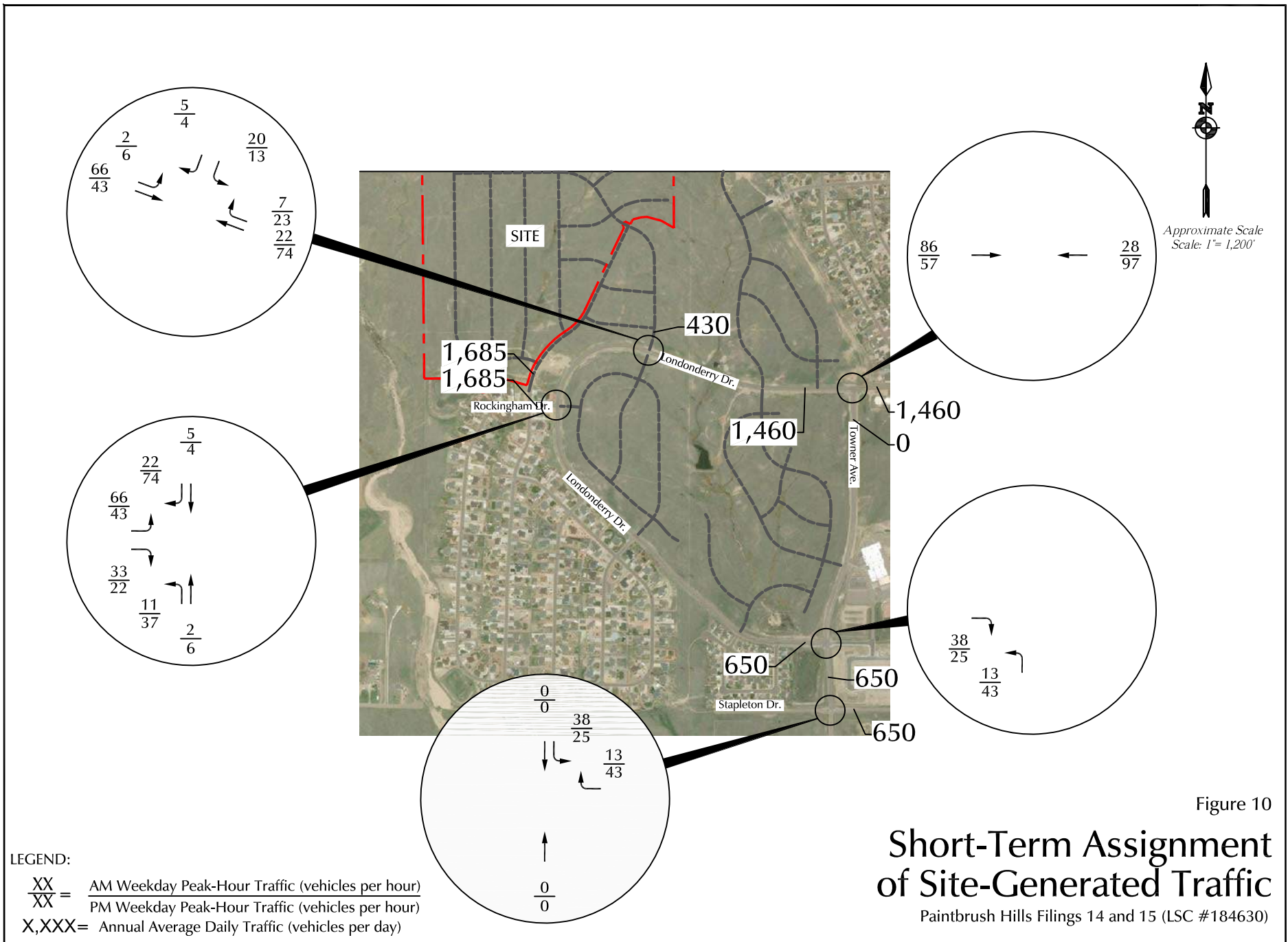
LEGEND:

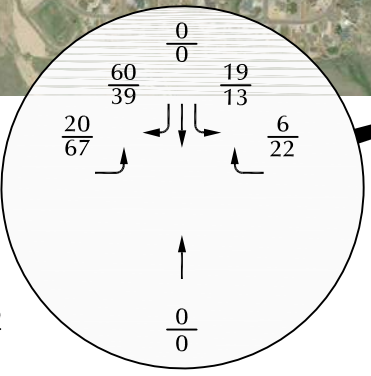
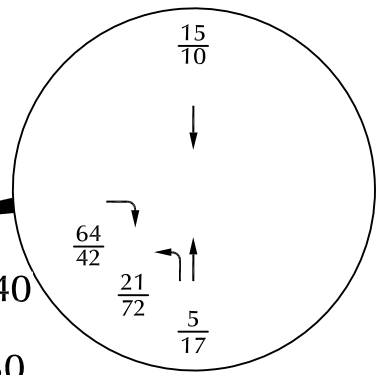
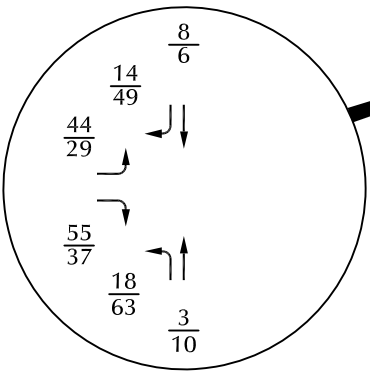
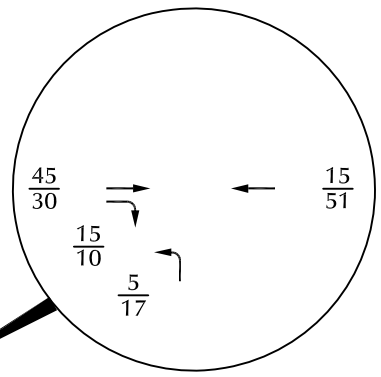
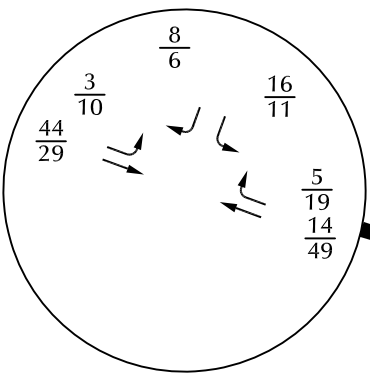
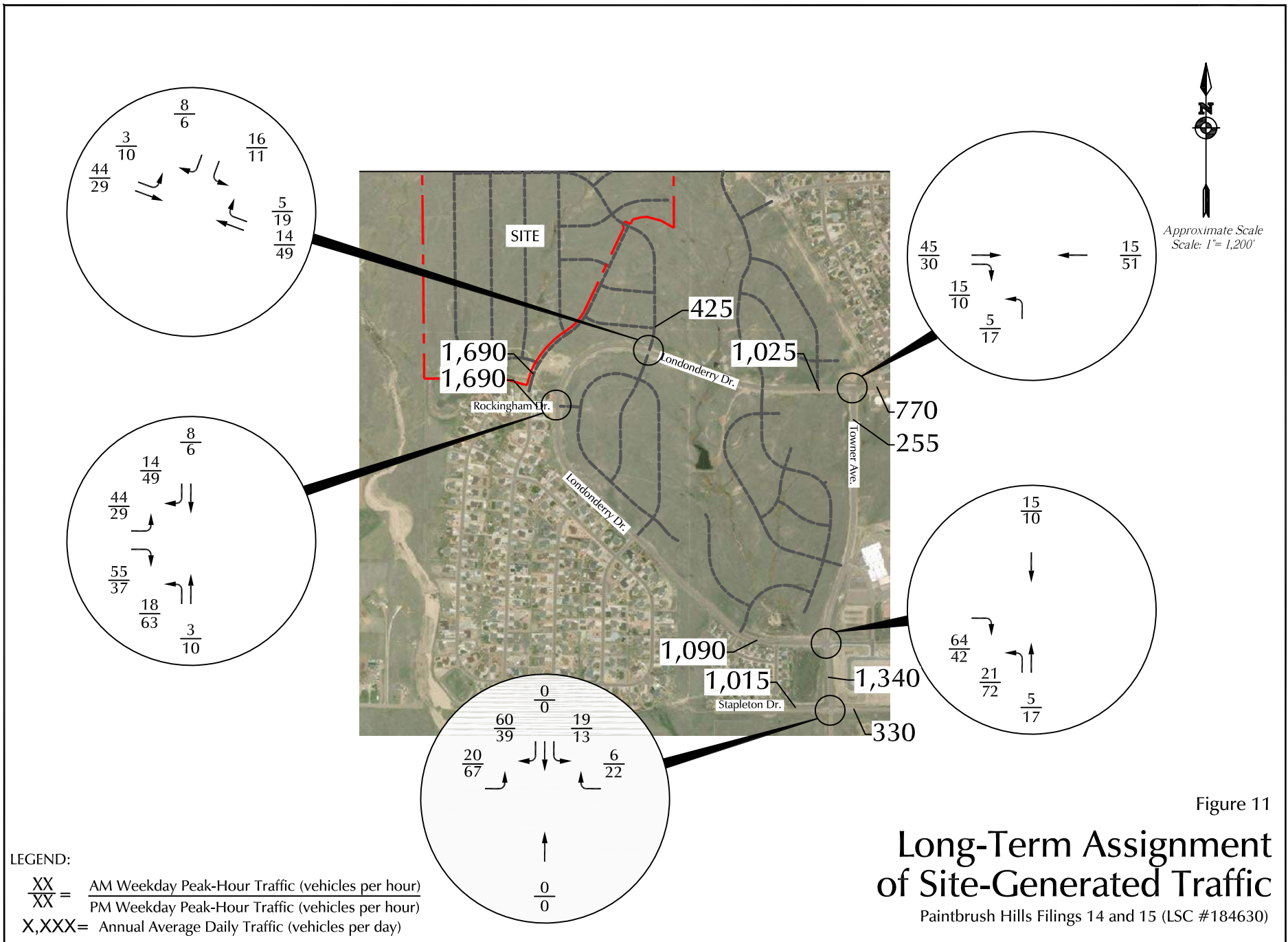
- = Stop Sign
- = Traffic Signal
- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
PM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service
PM Individual Movement Peak-Hour Level of Service
- $\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service
PM Entire Intersection Peak-Hour Level of Service
- X,XXX = Average Weekday Traffic (vehicles per day)



Figure 8
Year 2040 Background Traffic, Lane Geometry, Traffic Control and Level of Service
 Paintbrush Hills Filings 14 and 15 (LSC #184630)

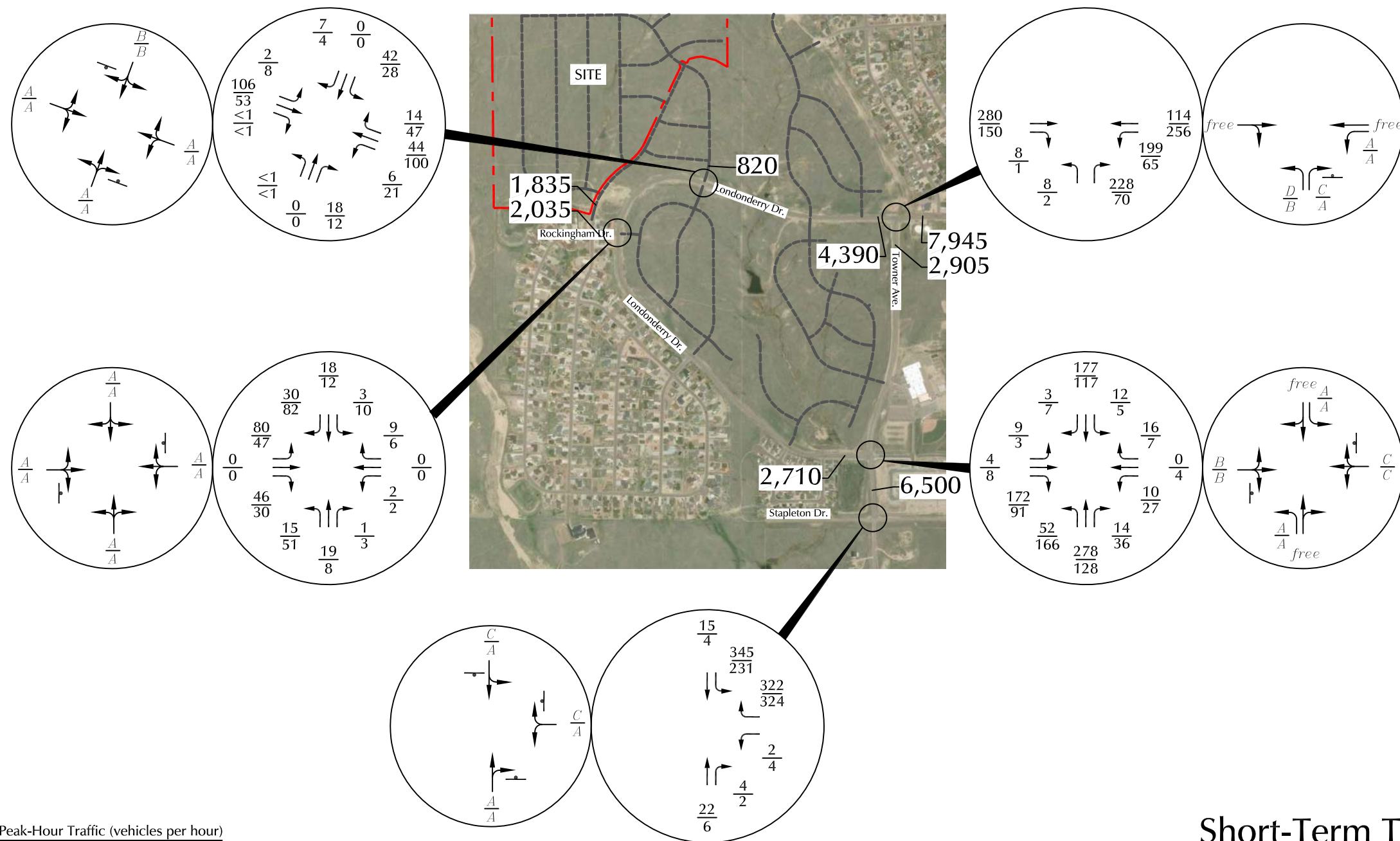








Approximate Scale
Scale: 1"= 1,200'



LEGEND:

⊥ = Stop Sign

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

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

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

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

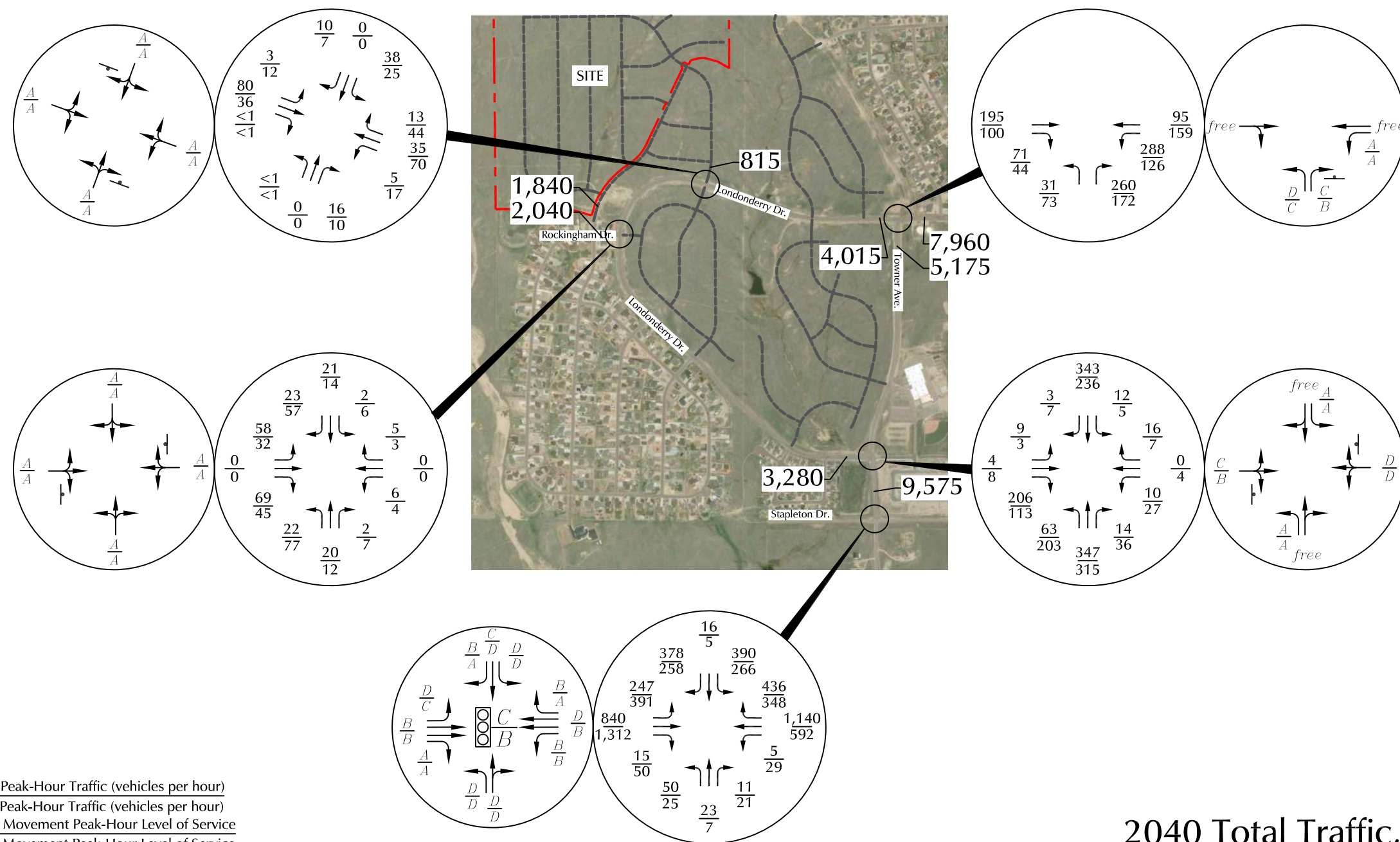
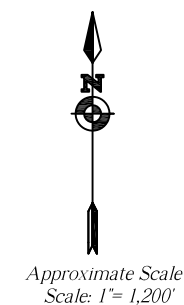
X,XXX = Average Weekday Traffic (vehicles per day)



Figure 12

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

Paintbrush Hills Filings 14 and 15 (LSC #184630)



LEGEND:

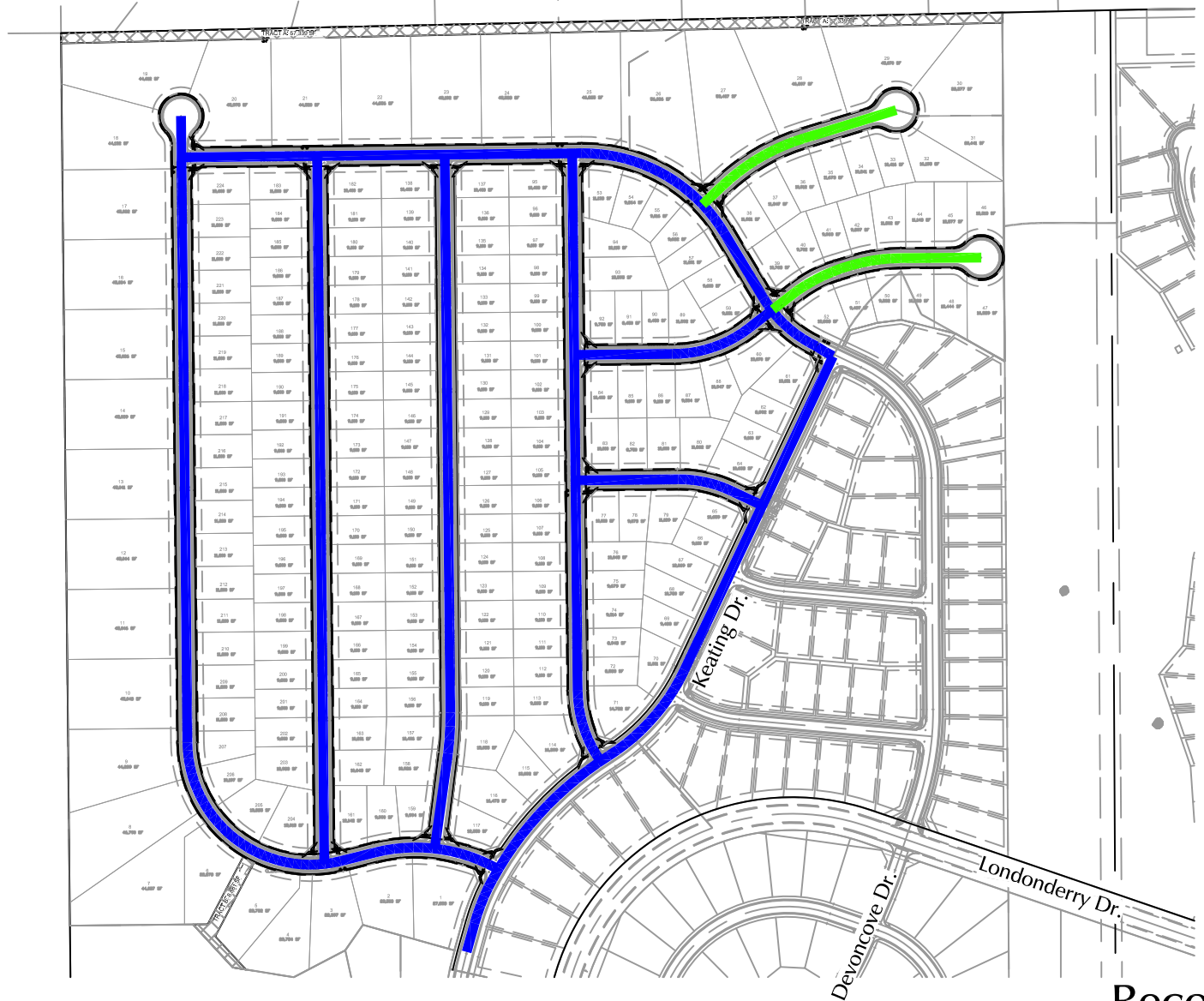
- = Stop Sign
- = Traffic Signal
- $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
PM Weekday Peak-Hour Traffic (vehicles per hour)
- $\frac{A}{B}$ = AM Individual Movement Peak-Hour Level of Service
PM Individual Movement Peak-Hour Level of Service
- $\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service
PM Entire Intersection Peak-Hour Level of Service
- X,XXX = Average Weekday Traffic (vehicles per day)




Figure 13

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

Paintbrush Hills Filings 14 and 15 (LSC #184630)




 Approximate Scale
 Scale: 1" = 400'

- LEGEND:**
- = Urban Residential Collector
 - = Urban Local
 - = Urban Local (Low Volume)

Figure 14
**Recommended
 Street Classifications**
 Paintbrush Hills Filings 14 and 15 (LSC #184630)

LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210

Colorado Springs, CO 80905

719-633-2868

File Name : N Towner Av - Londonderry Dr AM 9-18

Site Code : 184630

Start Date : 9/5/2018

Page No : 1

Groups Printed- Unshifted

Start Time	Southbound				Londonderry Dr Westbound				N Towner Ave Northbound				Londonderry Dr Eastbound				Int. Total
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06:45	0	0	0	0	8	2	0	0	2	0	3	0	0	7	0	0	22
Total	0	0	0	0	8	2	0	0	2	0	3	0	0	7	0	0	22
07:00	0	0	0	0	41	9	0	0	1	0	19	0	0	18	3	0	91
07:15	0	0	0	0	77	15	0	0	1	0	53	0	0	9	2	0	157
07:30	0	0	0	0	68	10	0	0	6	0	115	0	0	36	3	0	238
07:45	0	0	0	0	11	10	0	0	0	0	36	0	0	8	0	0	65
Total	0	0	0	0	197	44	0	0	8	0	223	0	0	71	8	0	551
08:00	0	0	0	0	8	4	0	0	1	0	8	0	0	4	0	0	25
08:15	0	0	0	0	10	2	0	0	0	0	11	0	0	6	1	0	30
08:30	0	0	0	0	2	5	0	0	1	0	2	0	0	6	0	0	16
Grand Total	0	0	0	0	225	57	0	0	12	0	247	0	0	94	9	0	644
Apprch %	0	0	0	0	79.8	20.2	0	0	4.6	0	95.4	0	0	91.3	8.7	0	
Total %	0	0	0	0	34.9	8.9	0	0	1.9	0	38.4	0	0	14.6	1.4	0	

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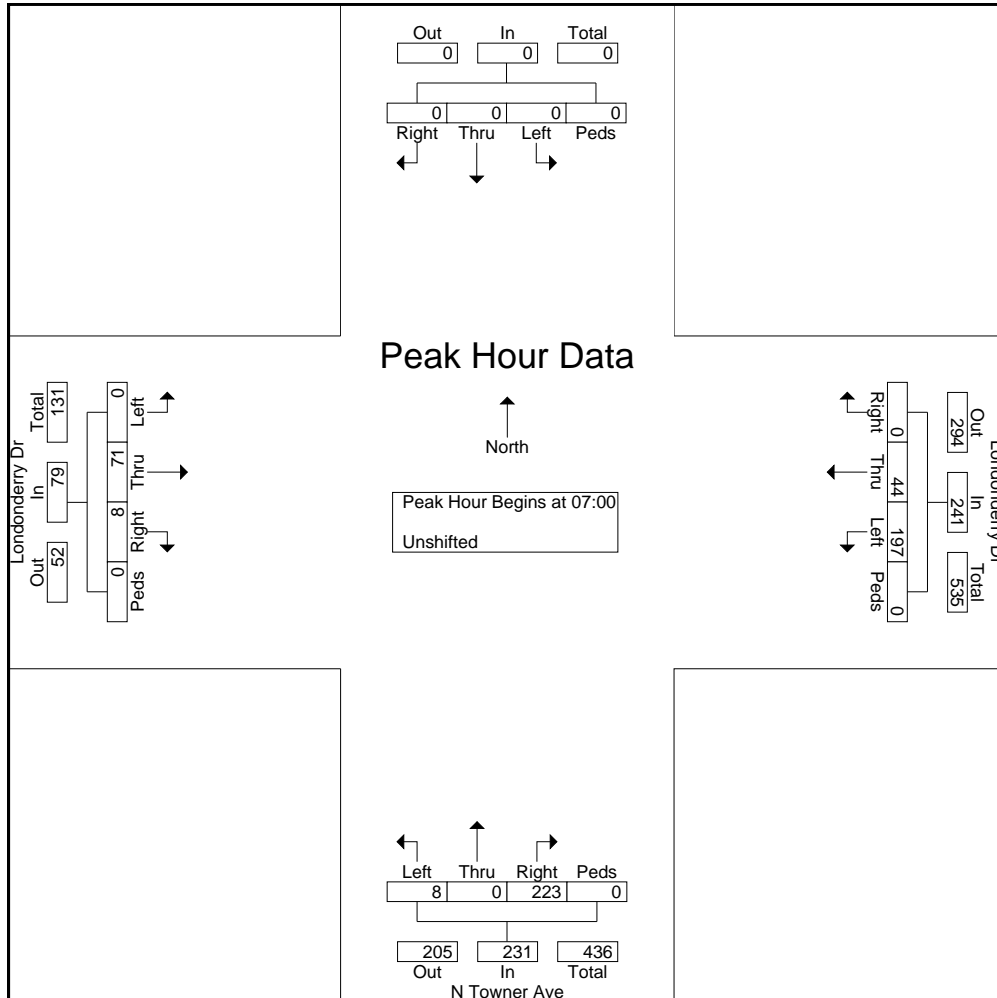
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Start Time	Southbound					Londonderry Dr Westbound					N Towner Ave Northbound					Londonderry Dr Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 6:45:00 AM to 8:30:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:00:00 AM																					
7:00:00 AM	0	0	0	0	0	41	9	0	0	50	1	0	19	0	20	0	18	3	0	21	91
7:15:00 AM	0	0	0	0	0	77	15	0	0	92	1	0	53	0	54	0	9	2	0	11	157
7:30:00 AM	0	0	0	0	0	68	10	0	0	78	6	0	115	0	121	0	36	3	0	39	238
7:45:00 AM	0	0	0	0	0	11	10	0	0	21	0	0	36	0	36	0	8	0	0	8	65
Total Volume	0	0	0	0	0	197	44	0	0	241	8	0	223	0	231	0	71	8	0	79	551
% App. Total	0	0	0	0	0	81.7	18.3	0	0		3.5	0	96.5	0		0	89.9	10.1	0		
PHF	.000	.000	.000	.000	.000	.640	.733	.000	.000	.655	.333	.000	.485	.000	.477	.000	.493	.667	.000	.506	.579



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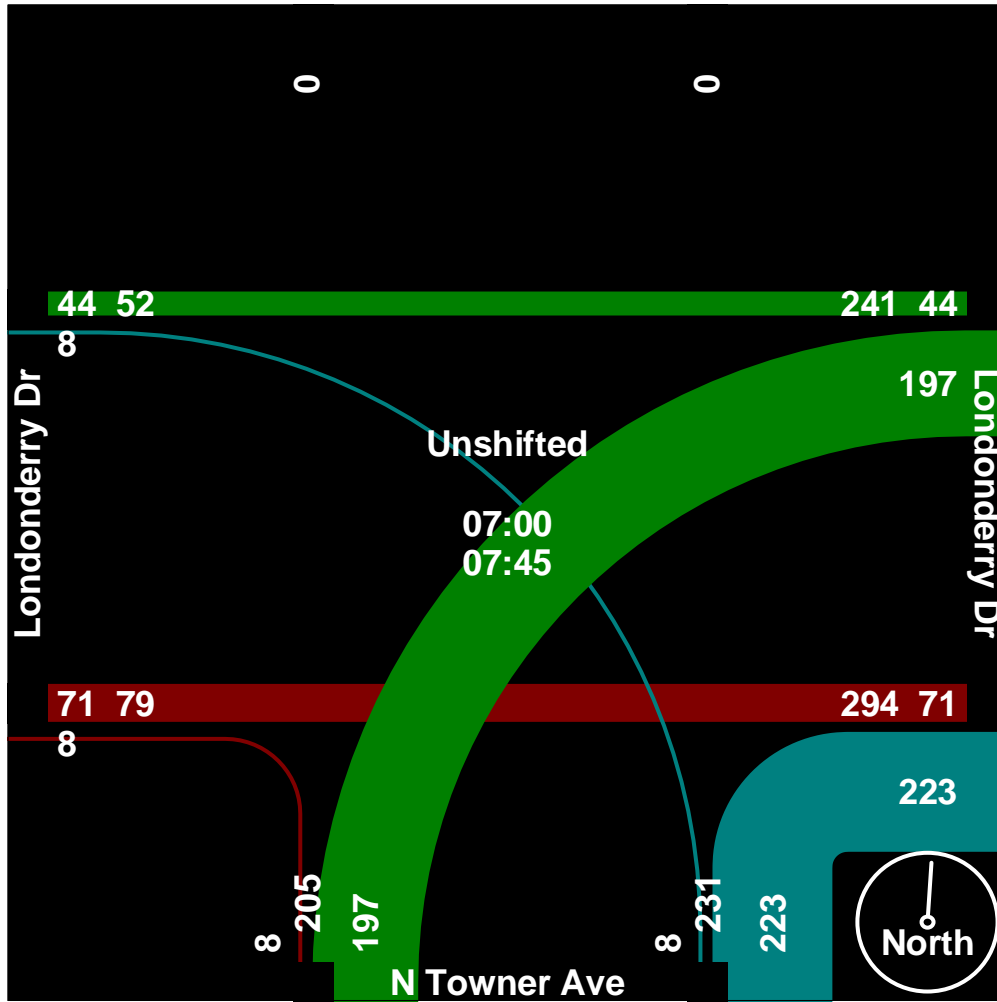
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File Name : N Towner Av - Londonderry Dr Mid 9-18

Site Code : 00184630

Start Date : 9/12/2018

Page No : 1

Groups Printed- Unshifted

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14:15	0	0	0	0	7	3	0	0	0	0	4	0	0	9	0	0	23
14:30	0	0	0	0	17	2	0	0	1	0	11	0	0	14	0	0	45
14:45	0	0	0	0	37	20	0	0	1	0	13	0	0	9	3	0	83
Total	0	0	0	0	61	25	0	0	2	0	28	0	0	32	3	0	151
15:00	0	0	0	0	20	8	0	0	2	0	76	0	0	13	1	0	120
15:15	0	0	0	0	12	12	0	0	2	0	20	0	0	6	1	0	53
15:30	0	0	0	0	4	6	0	0	0	0	12	0	0	10	1	0	33
15:45	0	0	0	0	17	7	0	0	0	0	9	0	0	2	0	0	35
Total	0	0	0	0	53	33	0	0	4	0	117	0	0	31	3	0	241
Grand Total	0	0	0	0	114	58	0	0	6	0	145	0	0	63	6	0	392
Apprch %	0	0	0	0	66.3	33.7	0	0	4	0	96	0	0	91.3	8.7	0	
Total %	0	0	0	0	29.1	14.8	0	0	1.5	0	37	0	0	16.1	1.5	0	

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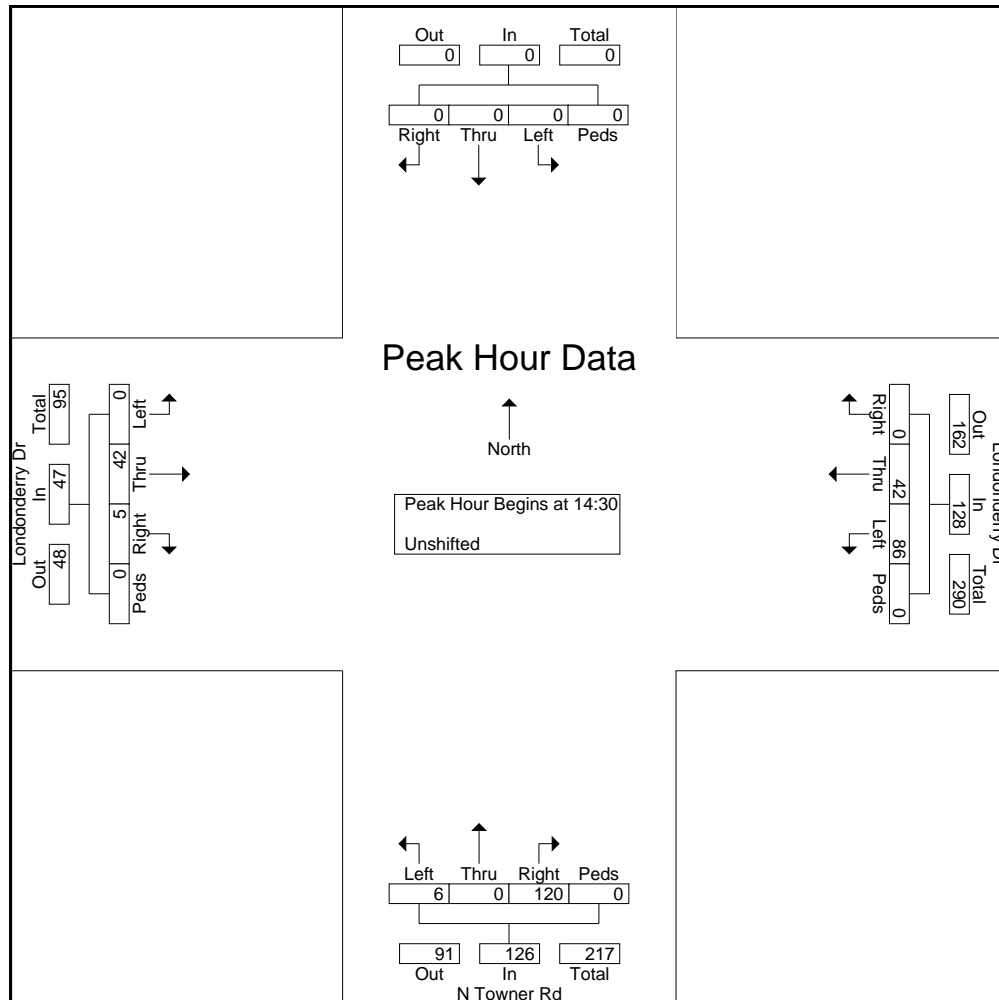
File Name : N Towner Av - Londonderry Dr Mid 9-18

Site Code : 00184630

Start Date : 9/12/2018

Page No : 2

Start Time	Southbound					Londonderry Dr Westbound					N Towner Rd Northbound					Londonderry Dr Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 2:15:00 PM to 3:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 2:30:00 PM																					
2:30:00 PM	0	0	0	0	0	17	2	0	0	19	1	0	11	0	12	0	14	0	0	14	45
2:45:00 PM	0	0	0	0	0	37	20	0	0	57	1	0	13	0	14	0	9	3	0	12	83
3:00:00 PM	0	0	0	0	0	20	8	0	0	28	2	0	76	0	78	0	13	1	0	14	120
3:15:00 PM	0	0	0	0	0	12	12	0	0	24	2	0	20	0	22	0	6	1	0	7	53
Total Volume	0	0	0	0	0	86	42	0	0	128	6	0	120	0	126	0	42	5	0	47	301
% App. Total	0	0	0	0	0	67.2	32.8	0	0		4.8	0	95.2	0		0	89.4	10.6	0		
PHF	.000	.000	.000	.000	.000	.581	.525	.000	.000	.561	.750	.000	.395	.000	.404	.000	.750	.417	.000	.839	.627



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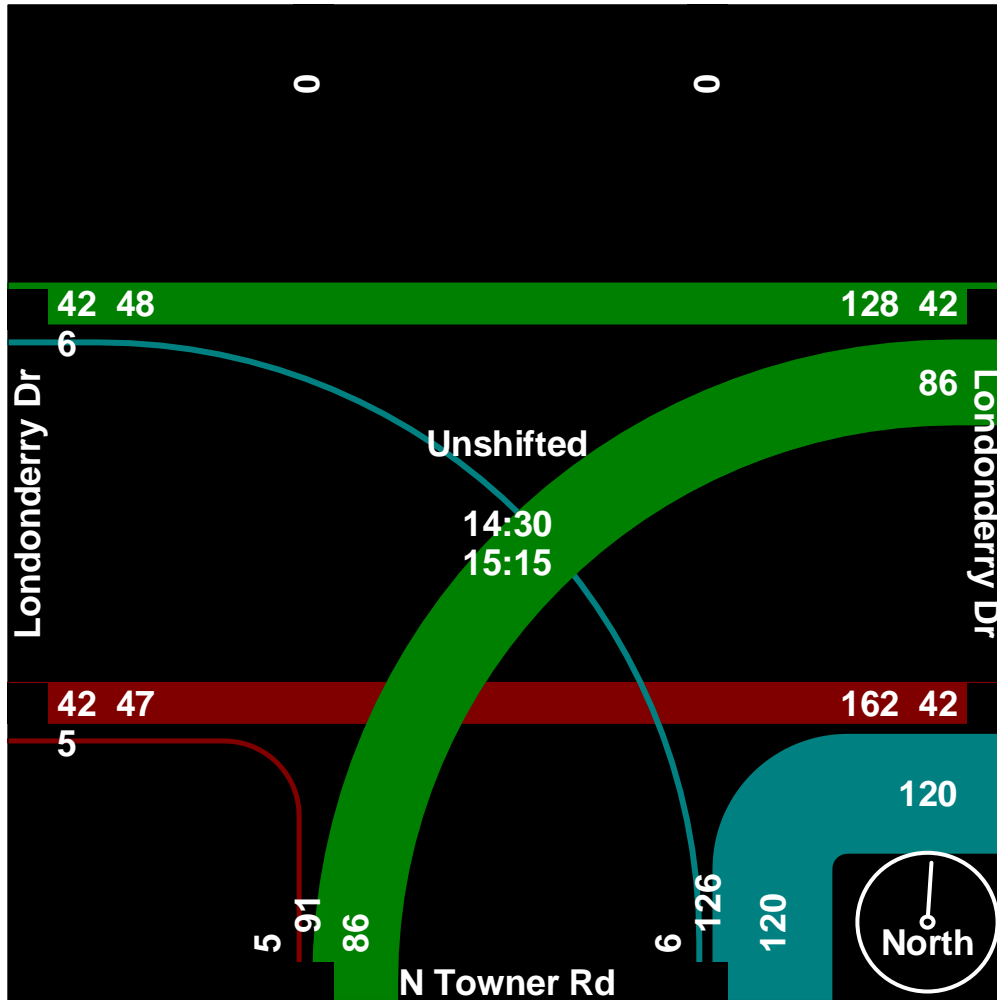
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Start Date : 9/11/2018

Page No : 1

Groups Printed- Unshifted

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16:45	0	0	0	0	12	2	0	0	1	0	7	0	0	4	0	0	26
Total	0	0	0	0	15	5	0	0	1	0	16	0	0	7	0	0	44
17:00	0	0	0	0	10	6	0	0	1	0	19	0	0	4	0	0	40
17:15	0	0	0	0	20	5	0	0	0	0	2	0	0	3	1	0	31
17:30	0	0	0	0	17	6	0	0	1	0	23	0	0	4	0	0	51
17:45	0	0	0	0	13	4	0	0	0	0	23	0	0	1	0	0	41
Total	0	0	0	0	60	21	0	0	2	0	67	0	0	12	1	0	163
18:00	0	0	0	0	4	4	0	0	0	0	4	0	0	1	0	0	13
18:15	0	0	0	0	3	7	0	0	0	0	3	0	0	3	0	0	16
Grand Total	0	0	0	0	82	37	0	0	3	0	90	0	0	23	1	0	236
Apprch %	0	0	0	0	68.9	31.1	0	0	3.2	0	96.8	0	0	95.8	4.2	0	
Total %	0	0	0	0	34.7	15.7	0	0	1.3	0	38.1	0	0	9.7	0.4	0	

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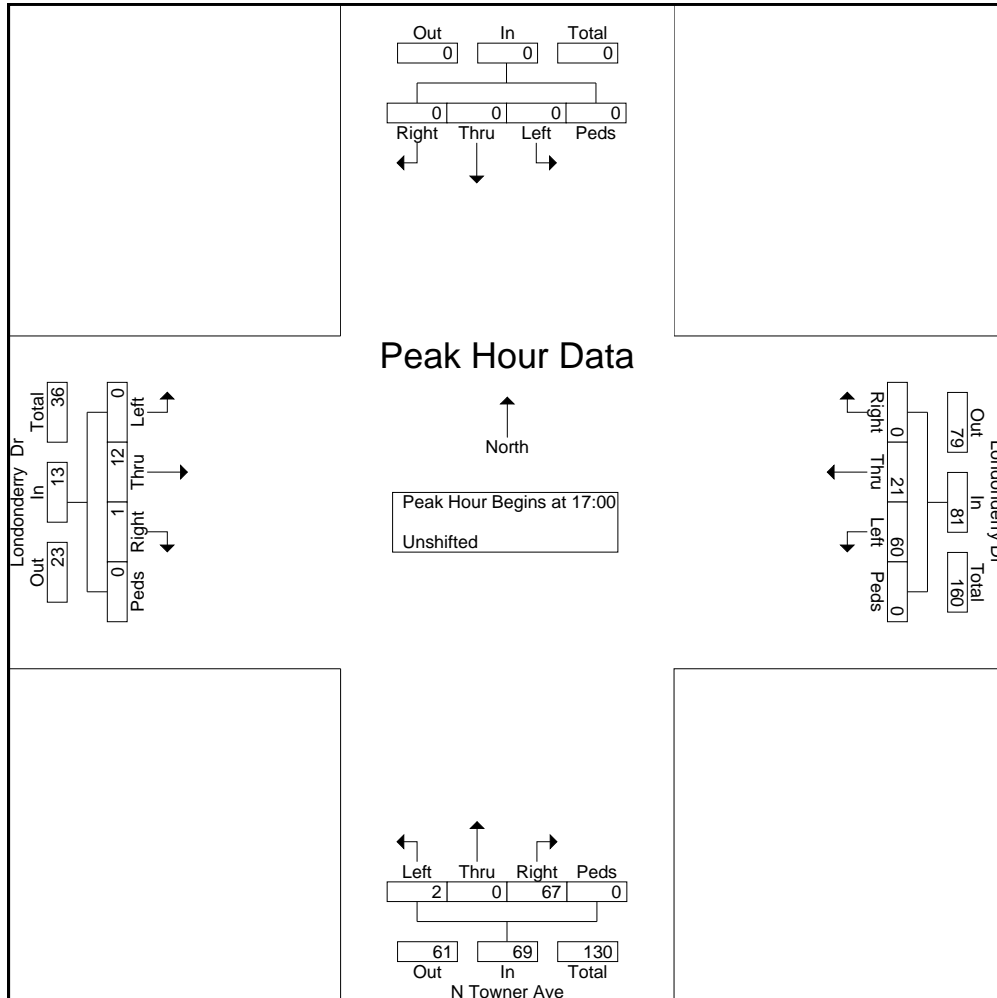
File Name : N Towner Av - Londonderry Dr PM 9-18

Site Code : 00184630

Start Date : 9/11/2018

Page No : 2

Start Time	Southbound					Londonderry Dr Westbound					N Towner Ave Northbound					Londonderry Dr Eastbound					Int. Total
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Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	10	6	0	0	16	1	0	19	0	20	0	4	0	0	4	40
17:15	0	0	0	0	0	20	5	0	0	25	0	0	2	0	2	0	3	1	0	4	31
17:30	0	0	0	0	0	17	6	0	0	23	1	0	23	0	24	0	4	0	0	4	51
17:45	0	0	0	0	0	13	4	0	0	17	0	0	23	0	23	0	1	0	0	1	41
Total Volume	0	0	0	0	0	60	21	0	0	81	2	0	67	0	69	0	12	1	0	13	163
% App. Total	0	0	0	0	0	74.1	25.9	0	0	81.0	2.9	0	97.1	0	69.0	0	92.3	7.7	0	13.0	163.0
PHF	.000	.000	.000	.000	.000	.750	.875	.000	.000	.810	.500	.000	.728	.000	.719	.000	.750	.250	.000	.813	.799



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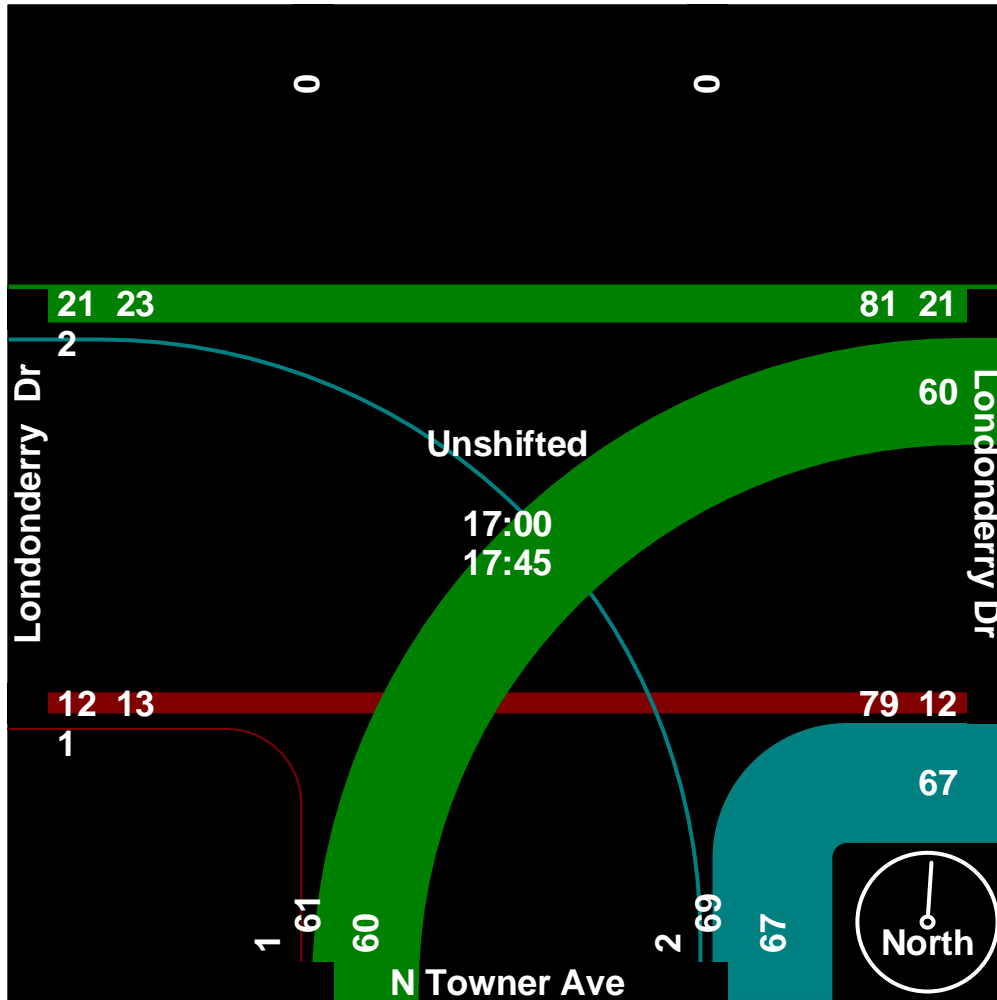
719-633-2868

File Name : N Towner Av - Londonderry Dr PM 9-18

Site Code : 00184630

Start Date : 9/11/2018

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File Name : S Towner Ave - Londonderry Dr AM

Site Code : 00184630

Start Date : 9/25/2018

Page No : 1

Groups Printed- Unshifted

Start Time	S Towner Ave Southbound				Londonderry Dr Westbound				S Towner Ave Northbound				Londonderry Dr Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30	0	3	1	0	1	0	0	0	1	8	1	0	0	1	18	0	34
06:45	1	11	1	0	0	0	3	0	10	26	0	0	0	0	14	0	66
Total	1	14	2	0	1	0	3	0	11	34	1	0	0	1	32	0	100
07:00	4	36	0	0	3	0	1	0	6	50	3	0	2	0	22	0	127
07:15	4	34	2	0	0	0	2	0	7	82	6	0	4	1	22	0	164
07:30	1	34	1	0	6	0	9	0	7	104	4	0	1	2	29	0	198
07:45	3	37	0	0	1	0	4	0	4	30	1	0	2	1	16	0	99
Total	12	141	3	0	10	0	16	0	24	266	14	0	9	4	89	0	588
08:00	3	10	0	0	0	0	1	0	12	18	1	0	0	0	12	0	57
08:15	3	18	2	0	1	0	1	0	4	18	1	0	2	0	11	0	61
Grand Total	19	183	7	0	12	0	21	0	51	336	17	0	11	5	144	0	806
Apprch %	9.1	87.6	3.3	0	36.4	0	63.6	0	12.6	83.2	4.2	0	6.9	3.1	90	0	
Total %	2.4	22.7	0.9	0	1.5	0	2.6	0	6.3	41.7	2.1	0	1.4	0.6	17.9	0	

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719-633-2868

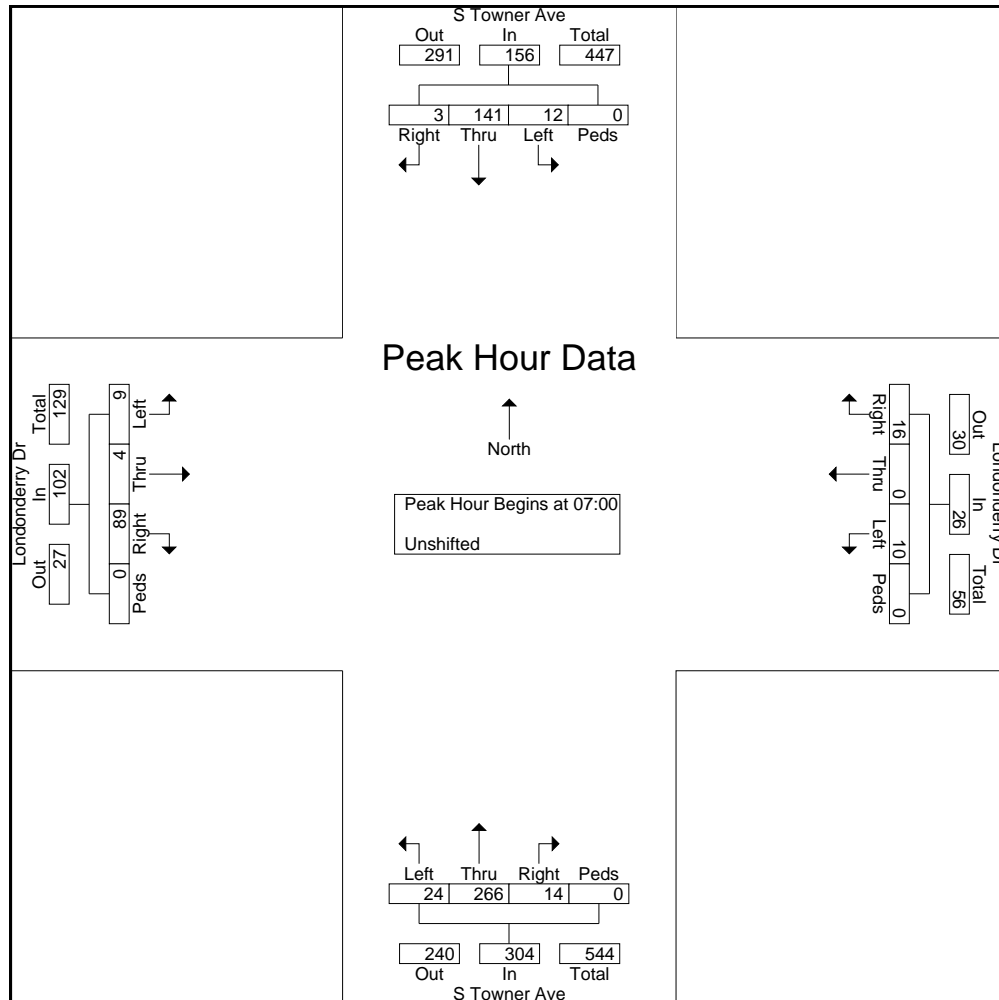
File Name : S Towner Ave - Londonderry Dr AM

Site Code : 00184630

Start Date : 9/25/2018

Page No : 2

Start Time	S Towner Ave Southbound					Londonderry Dr Westbound					S Towner Ave Northbound					Londonderry Dr Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:00:00 AM																					
7:00:00 AM	4	36	0	0	40	3	0	1	0	4	6	50	3	0	59	2	0	22	0	24	127
7:15:00 AM	4	34	2	0	40	0	0	2	0	2	7	82	6	0	95	4	1	22	0	27	164
7:30:00 AM	1	34	1	0	36	6	0	9	0	15	7	104	4	0	115	1	2	29	0	32	198
7:45:00 AM	3	37	0	0	40	1	0	4	0	5	4	30	1	0	35	2	1	16	0	19	99
Total Volume	12	141	3	0	156	10	0	16	0	26	24	266	14	0	304	9	4	89	0	102	588
% App. Total	7.7	90.4	1.9	0		38.5	0	61.5	0		7.9	87.5	4.6	0		8.8	3.9	87.3	0		
PHF	.750	.953	.375	.000	.975	.417	.000	.444	.000	.433	.857	.639	.583	.000	.661	.563	.500	.767	.000	.797	.742



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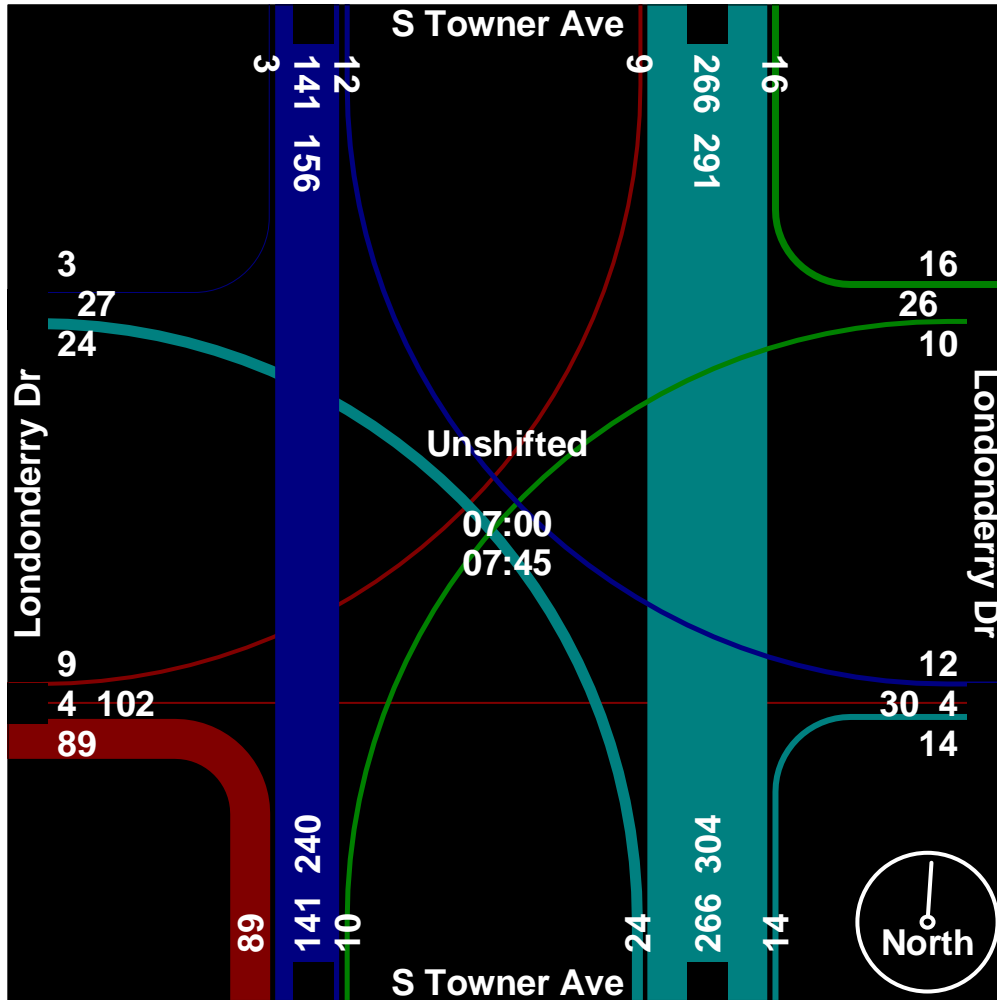
719-633-2868

File Name : S Towner Ave - Londonderry Dr AM

Site Code : 00184630

Start Date : 9/25/2018

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File Name : S Towner Ave - Londonderry Dr PM

Site Code : 00184630

Start Date : 9/25/2018

Page No : 1

Groups Printed- Unshifted

Start Time	S Towner Ave Southbound				Londonderry Dr Westbound				S Towner Ave Northbound				Londonderry Dr Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
16:30	3	7	0	0	0	1	0	0	14	6	1	0	1	0	16	0	49
16:45	0	3	1	0	0	0	0	0	20	25	1	0	1	0	12	0	63
Total	3	10	1	0	0	1	0	0	34	31	2	0	2	0	28	0	112
17:00	1	7	0	0	1	0	0	0	16	44	6	0	2	0	13	0	90
17:15	2	11	2	0	4	0	0	0	18	23	15	0	0	2	5	0	82
17:30	1	23	1	0	10	1	1	0	11	18	11	0	1	2	10	0	90
17:45	2	28	1	0	10	2	4	0	24	23	8	0	1	2	11	0	116
Total	6	69	4	0	25	3	5	0	69	108	40	0	4	6	39	0	378
18:00	0	31	3	0	3	1	2	0	20	24	2	0	1	2	10	0	99
18:15	0	7	1	0	3	1	0	0	13	12	2	0	1	0	4	0	44
Grand Total	9	117	9	0	31	6	7	0	136	175	46	0	8	8	81	0	633
Apprch %	6.7	86.7	6.7	0	70.5	13.6	15.9	0	38.1	49	12.9	0	8.2	8.2	83.5	0	
Total %	1.4	18.5	1.4	0	4.9	0.9	1.1	0	21.5	27.6	7.3	0	1.3	1.3	12.8	0	

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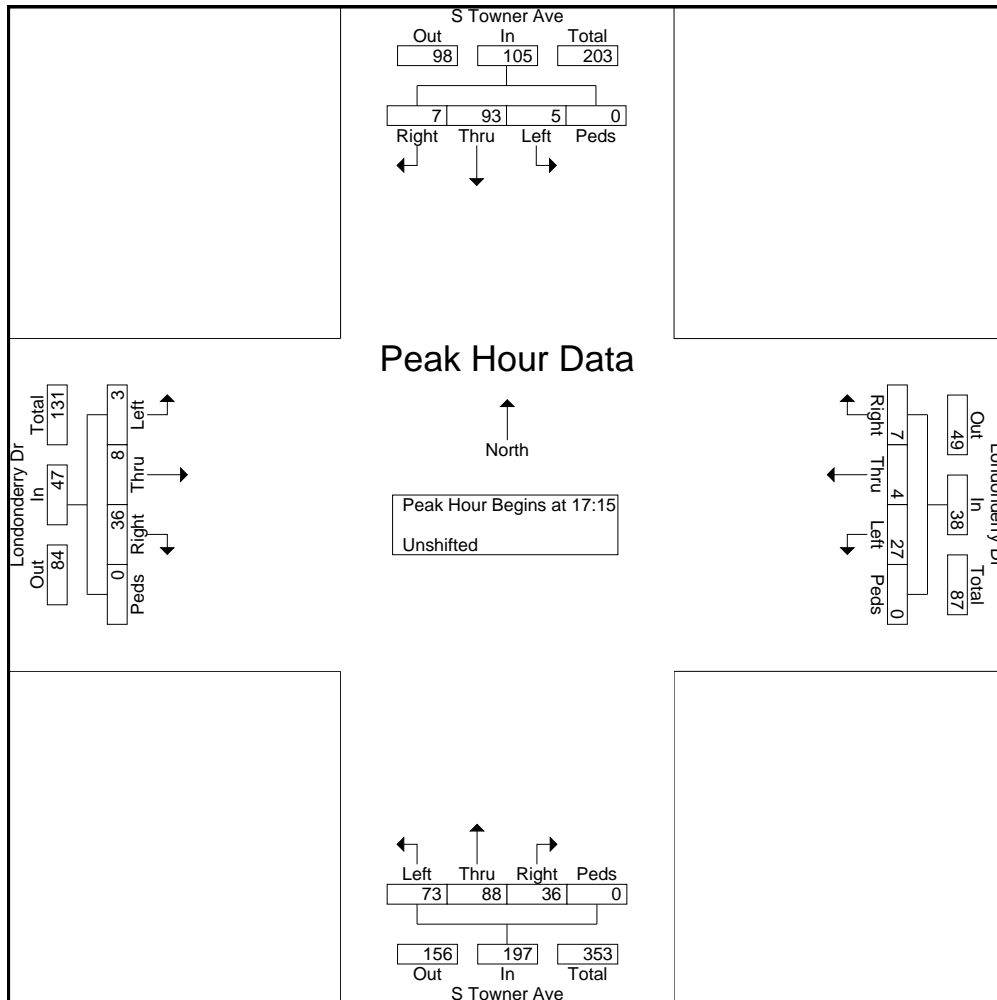
File Name : S Towner Ave - Londonderry Dr PM

Site Code : 00184630

Start Date : 9/25/2018

Page No : 2

Start Time	S Towner Ave Southbound					Londonderry Dr Westbound					S Towner Ave Northbound					Londonderry Dr Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:15																					
17:15	2	11	2	0	15	4	0	0	0	4	18	23	15	0	56	0	2	5	0	7	82
17:30	1	23	1	0	25	10	1	1	0	12	11	18	11	0	40	1	2	10	0	13	90
17:45	2	28	1	0	31	10	2	4	0	16	24	23	8	0	55	1	2	11	0	14	116
18:00	0	31	3	0	34	3	1	2	0	6	20	24	2	0	46	1	2	10	0	13	99
Total Volume	5	93	7	0	105	27	4	7	0	38	73	88	36	0	197	3	8	36	0	47	387
% App. Total	4.8	88.6	6.7	0		71.1	10.5	18.4	0		37.1	44.7	18.3	0		6.4	17	76.6	0		
PHF	.625	.750	.583	.000	.772	.675	.500	.438	.000	.594	.760	.917	.600	.000	.879	.750	1.0	.818	.000	.839	.834



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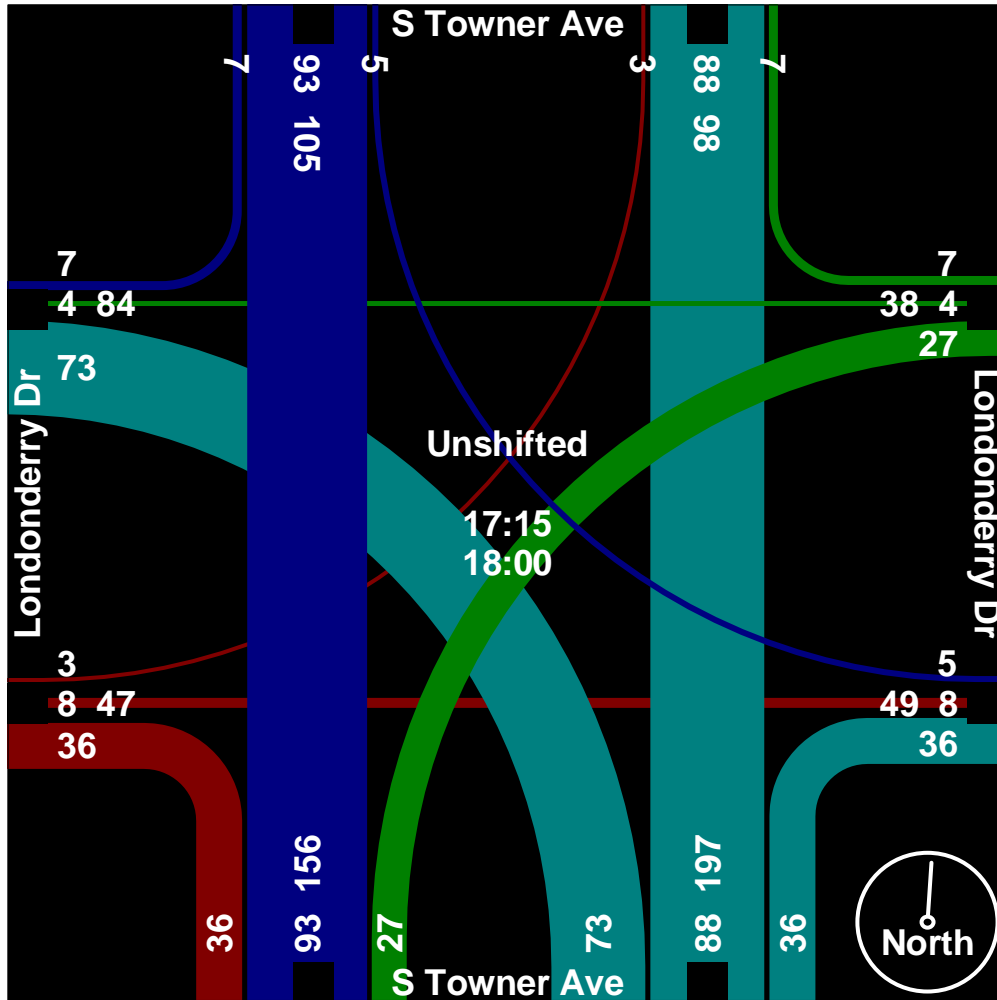
719-633-2868

File Name : S Towner Ave - Londonderry Dr PM

Site Code : 00184630

Start Date : 9/25/2018

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File Name : S Towner Ave - Londonderry Dr Schl

Site Code : 00184630

Start Date : 9/26/2018

Page No : 1

Groups Printed- Unshifted

Start Time	S Towner Ave Southbound				Londonderry Dr Westbound				S Towner Ave Northbound				Londonderry Dr Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
14:00	1	13	0	0	2	0	0	0	17	7	3	0	0	0	12	0	55
14:15	0	14	0	0	0	0	0	0	10	5	2	0	1	1	6	0	39
14:30	0	5	2	0	1	0	1	0	18	24	2	0	0	0	6	0	59
14:45	0	10	1	0	0	0	0	0	21	34	8	0	4	4	14	0	96
Total	1	42	3	0	3	0	1	0	66	70	15	0	5	5	38	0	249
15:00	0	56	2	0	8	0	10	0	10	32	6	0	2	8	34	0	168
15:15	1	28	3	0	2	0	0	0	12	14	1	0	1	0	19	0	81
15:30	1	13	0	0	2	1	1	0	13	5	1	0	1	0	11	0	49
Grand Total	3	139	8	0	15	1	12	0	101	121	23	0	9	13	102	0	547
Apprch %	2	92.7	5.3	0	53.6	3.6	42.9	0	41.2	49.4	9.4	0	7.3	10.5	82.3	0	
Total %	0.5	25.4	1.5	0	2.7	0.2	2.2	0	18.5	22.1	4.2	0	1.6	2.4	18.6	0	

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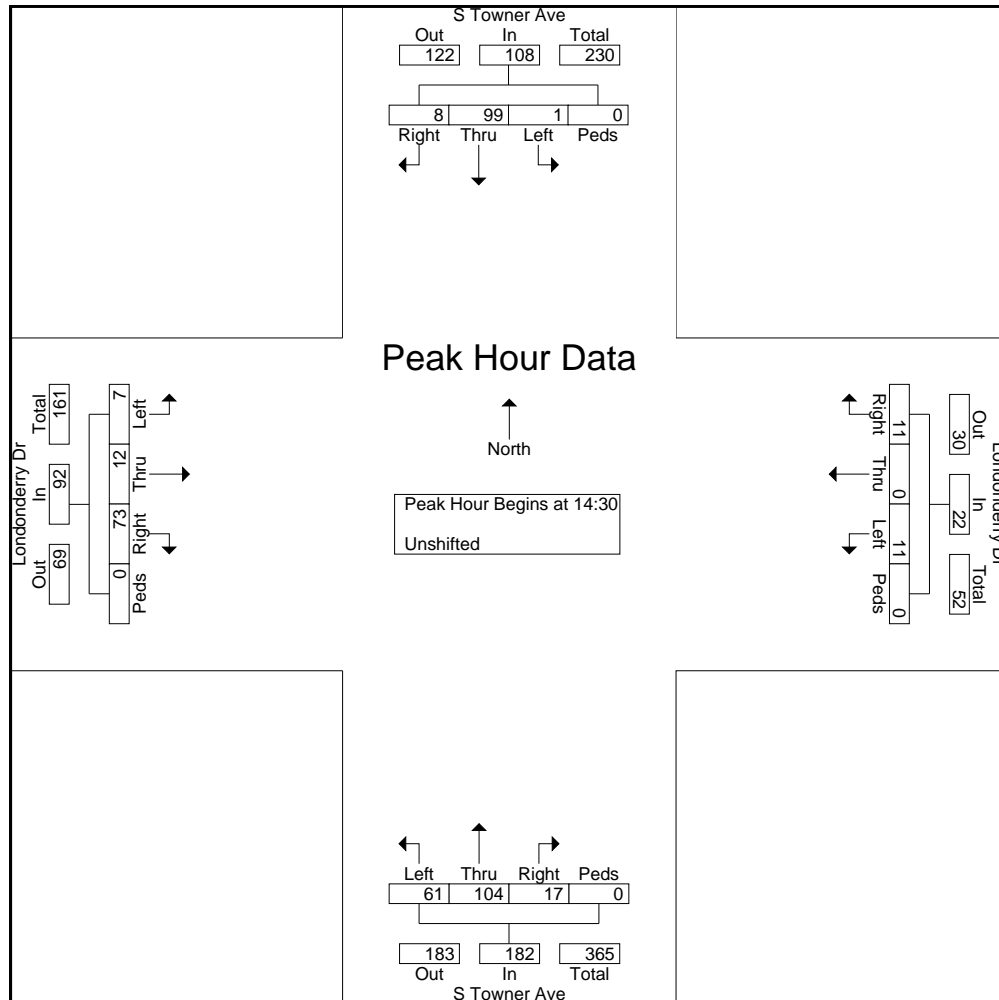
File Name : S Towner Ave - Londonderry Dr Schl

Site Code : 00184630

Start Date : 9/26/2018

Page No : 2

Start Time	S Towner Ave Southbound					Londonderry Dr Westbound					S Towner Ave Northbound					Londonderry Dr Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 2:00:00 PM to 3:30:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 2:30:00 PM																					
2:30:00 PM	0	5	2	0	7	1	0	1	0	2	18	24	2	0	44	0	0	6	0	6	59
2:45:00 PM	0	10	1	0	11	0	0	0	0	0	21	34	8	0	63	4	4	14	0	22	96
3:00:00 PM	0	56	2	0	58	8	0	10	0	18	10	32	6	0	48	2	8	34	0	44	168
3:15:00 PM	1	28	3	0	32	2	0	0	0	2	12	14	1	0	27	1	0	19	0	20	81
Total Volume	1	99	8	0	108	11	0	11	0	22	61	104	17	0	182	7	12	73	0	92	404
% App. Total	0.9	91.7	7.4	0		50	0	50	0		33.5	57.1	9.3	0		7.6	13	79.3	0		
PHF	.250	.442	.667	.000	.466	.344	.000	.275	.000	.306	.726	.765	.531	.000	.722	.438	.375	.537	.000	.523	.601



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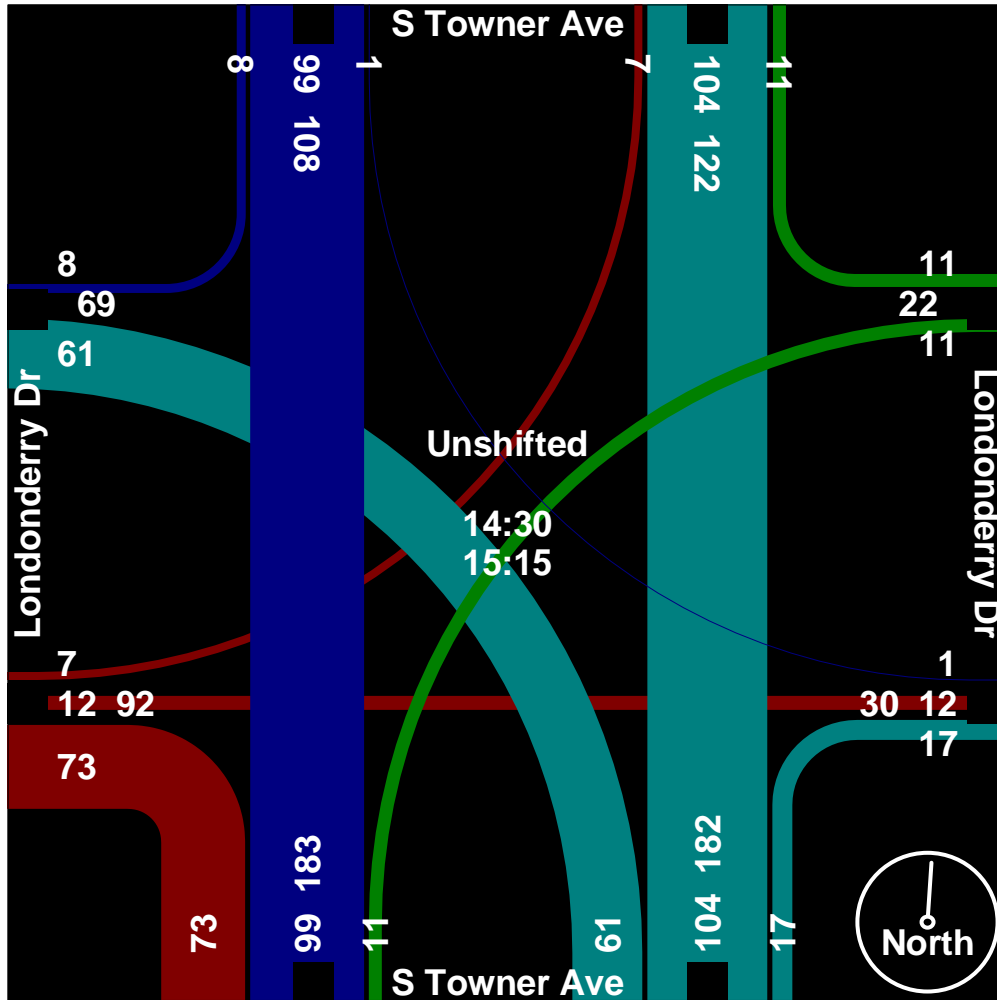
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File Name : S Towner Ave - Londonderry Dr Schl

Site Code : 00184630

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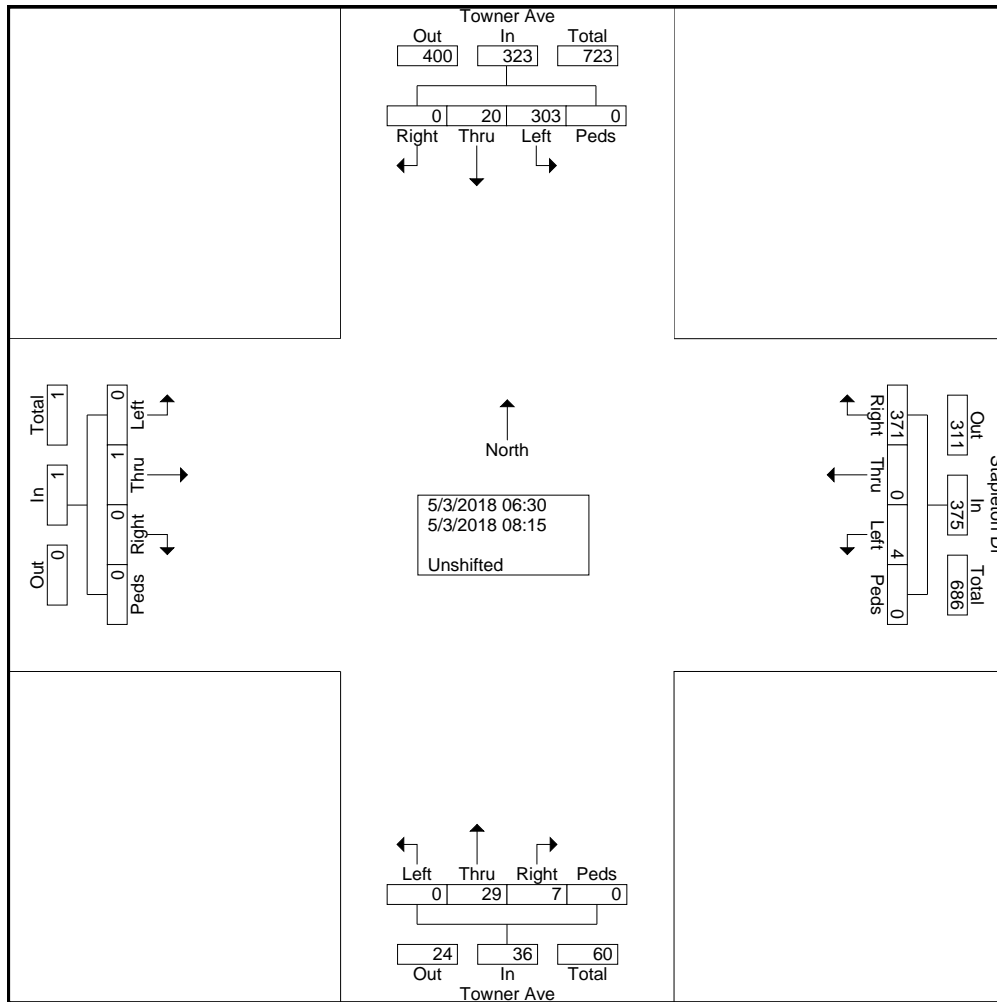
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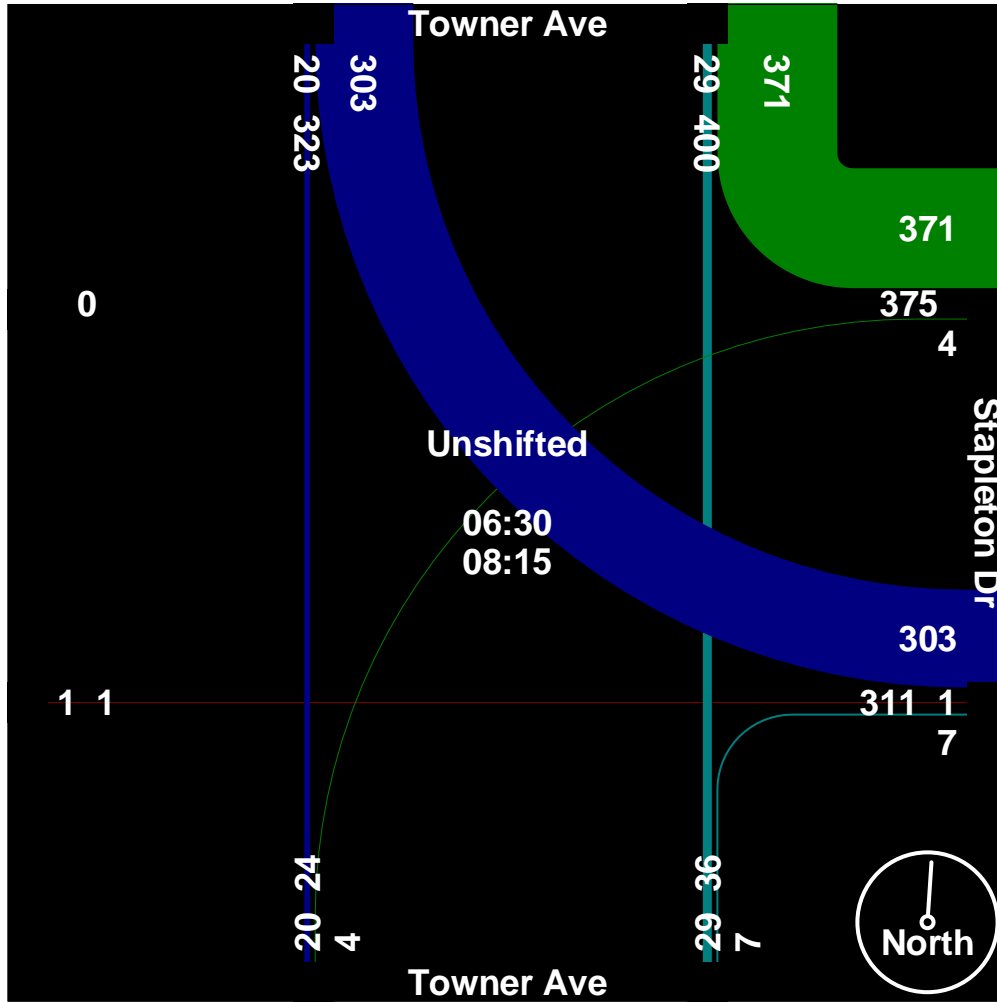
Start Time	Towner Ave Southbound					Stapleton Dr Westbound					Towner Ave Northbound					Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
06:30	22	1	0	0	23	1	0	16	0	17	0	2	1	0	3	0	0	0	0	0	43
06:45	26	1	0	0	27	0	0	33	0	33	0	2	1	0	3	0	1	0	0	1	64
Total	48	2	0	0	50	1	0	49	0	50	0	4	2	0	6	0	1	0	0	1	107
07:00	48	5	0	0	53	0	0	47	0	47	0	5	0	0	5	0	0	0	0	0	105
07:15	65	4	0	0	69	0	0	93	0	93	0	6	2	0	8	0	0	0	0	0	170
07:30	59	4	0	0	63	1	0	119	0	120	0	8	1	0	9	0	0	0	0	0	192
07:45	45	2	0	0	47	1	0	31	0	32	0	3	1	0	4	0	0	0	0	0	83
Total	217	15	0	0	232	2	0	290	0	292	0	22	4	0	26	0	0	0	0	0	550
08:00	22	1	0	0	23	1	0	20	0	21	0	2	1	0	3	0	0	0	0	0	47
08:15	16	2	0	0	18	0	0	12	0	12	0	1	0	0	1	0	0	0	0	0	31

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Groups Printed- Unshifted

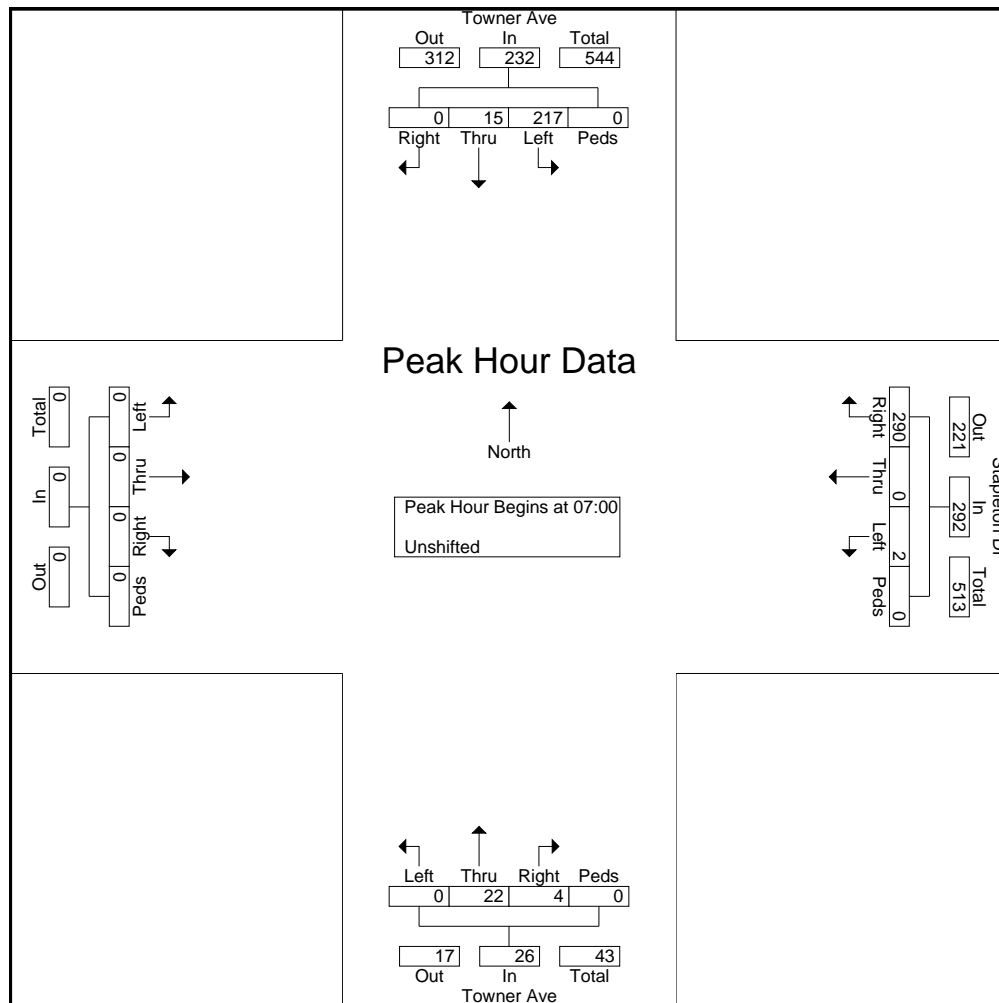
	Towner Ave Southbound					Stapleton Dr Westbound					Towner Ave Northbound					Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Grand Total	303	20	0	0	323	4	0	371	0	375	0	29	7	0	36	0	1	0	0	1	735
Apprch %	93.8	6.2	0	0		1.1	0	98.9	0		0	80.6	19.4	0		0	100	0	0		
Total %	41.2	2.7	0	0	43.9	0.5	0	50.5	0	51	0	3.9	1	4.9	0	0.1	0	0	0	0.1	

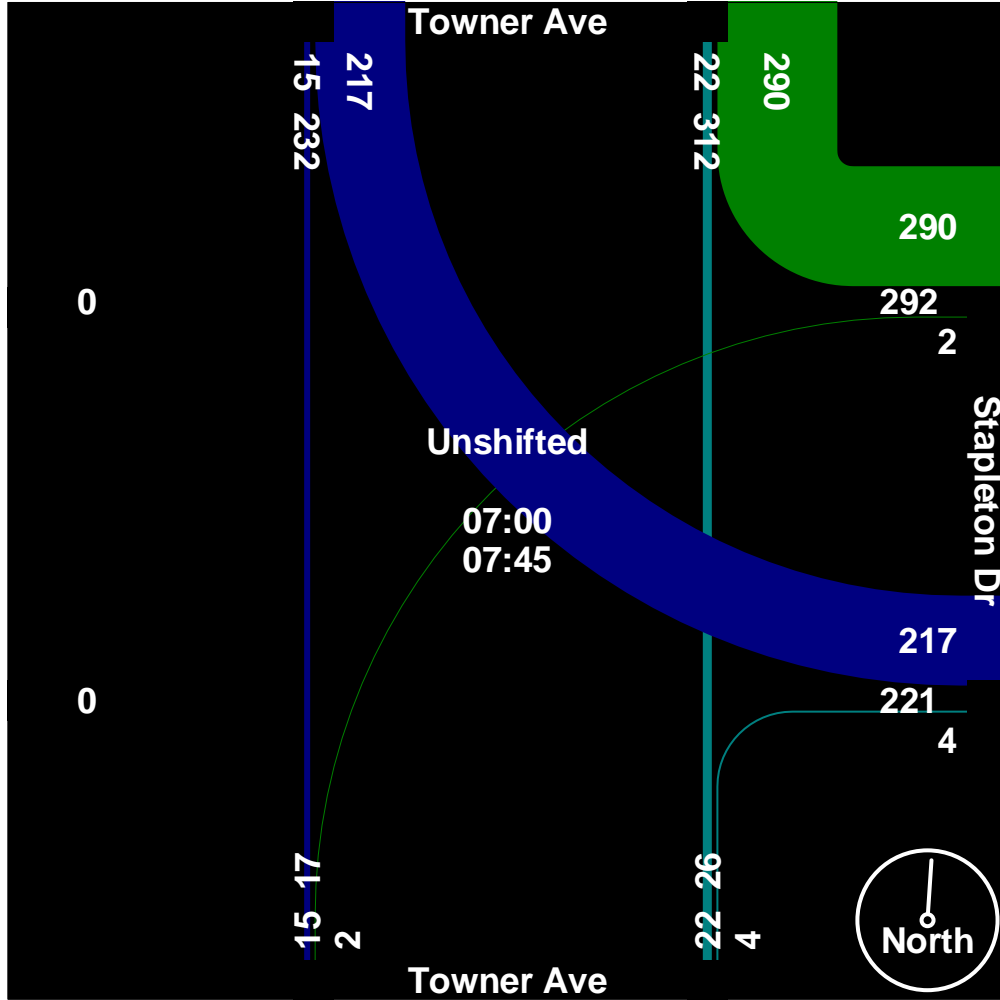


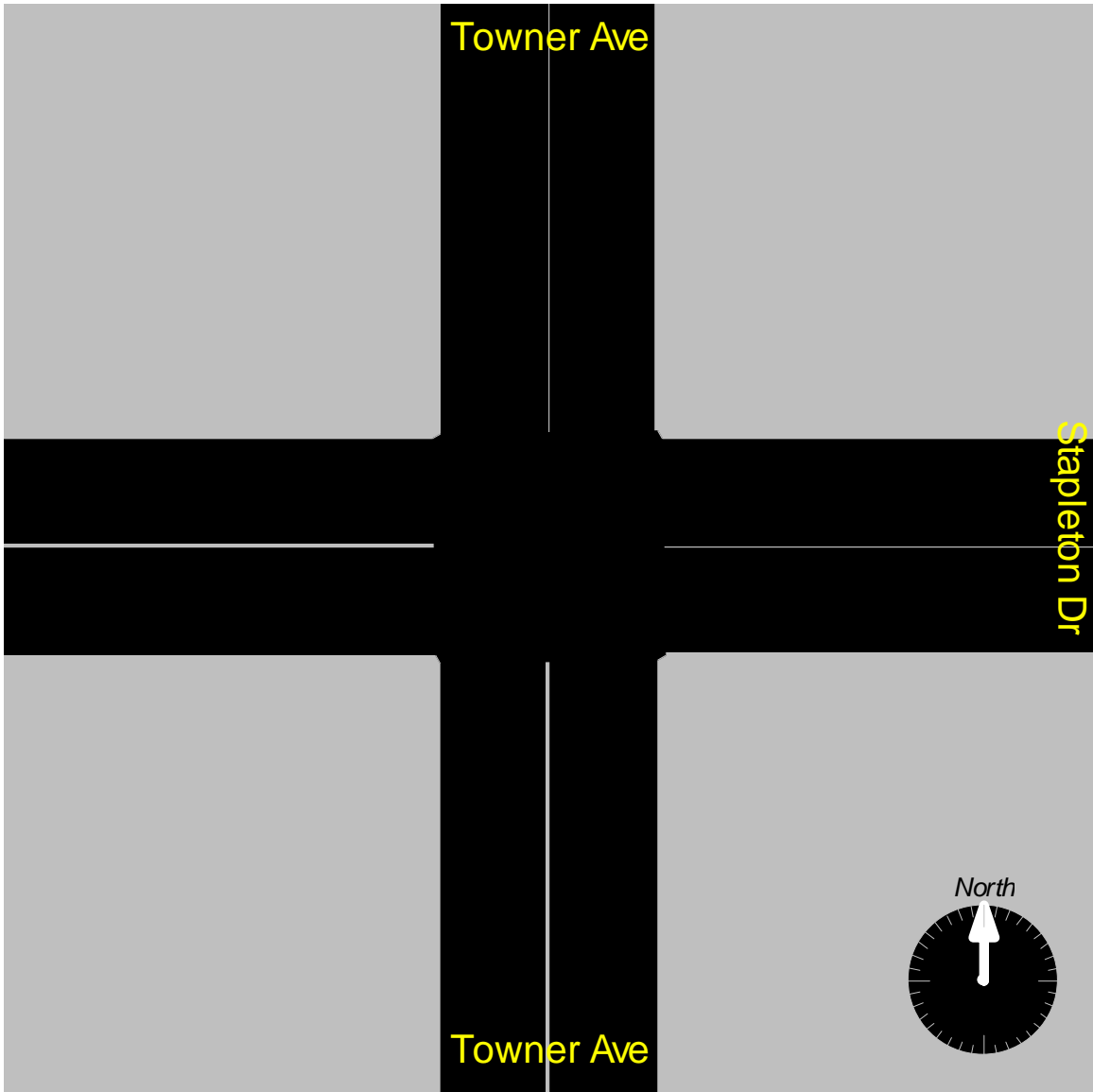


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Start Time	Towner Ave Southbound					Stapleton Dr Westbound					Towner Ave Northbound					Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 06:30 to 08:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00																					
07:00	48	5	0	0	53	0	0	47	0	47	0	5	0	0	5	0	0	0	0	0	105
07:15	65	4	0	0	69	0	0	93	0	93	0	6	2	0	8	0	0	0	0	0	170
07:30	59	4	0	0	63	1	0	119	0	120	0	8	1	0	9	0	0	0	0	0	192
07:45	45	2	0	0	47	1	0	31	0	32	0	3	1	0	4	0	0	0	0	0	83
Total Volume	217	15	0	0	232	2	0	290	0	292	0	22	4	0	26	0	0	0	0	0	550
% App. Total	93.5	6.5	0	0		0.7	0	99.3	0		0	84.6	15.4	0		0	0	0	0		
PHF	.835	.750	.000	.000	.841	.500	.000	.609	.000	.608	.000	.688	.500	.000	.722	.000	.000	.000	.000	.000	.716







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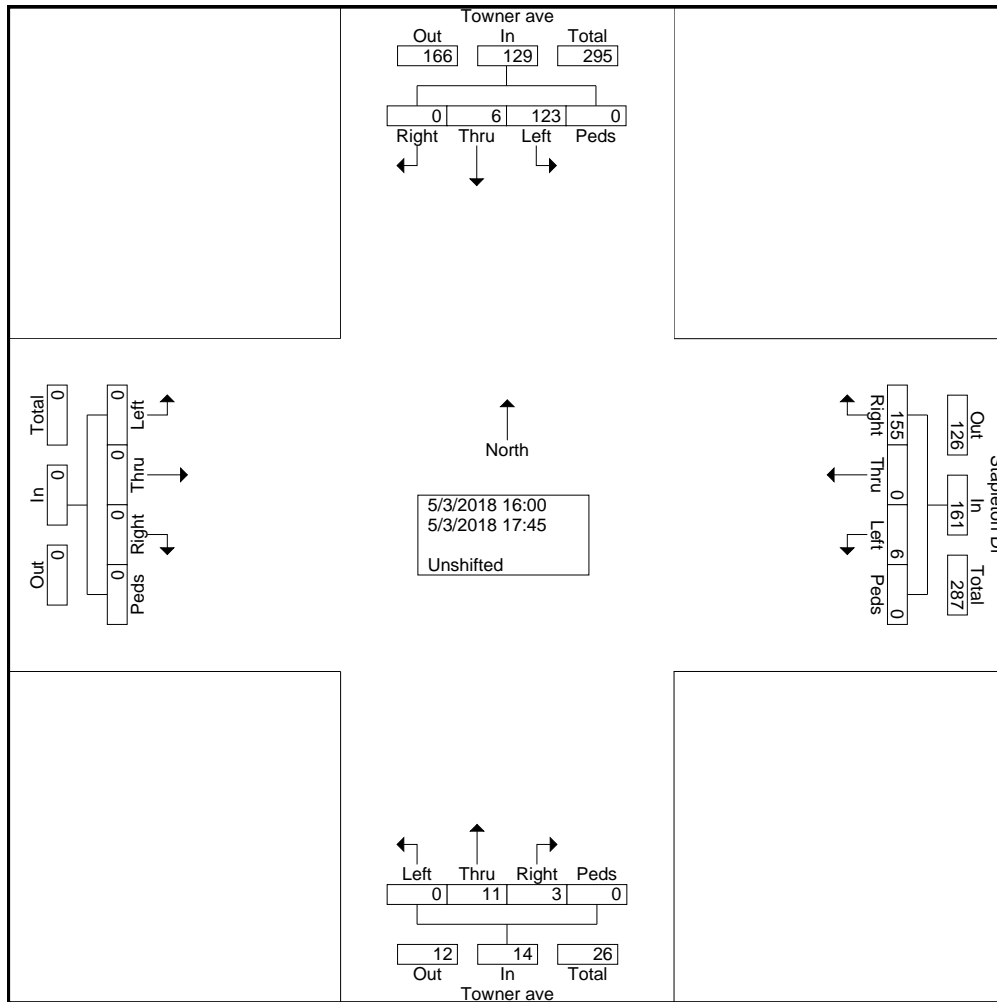
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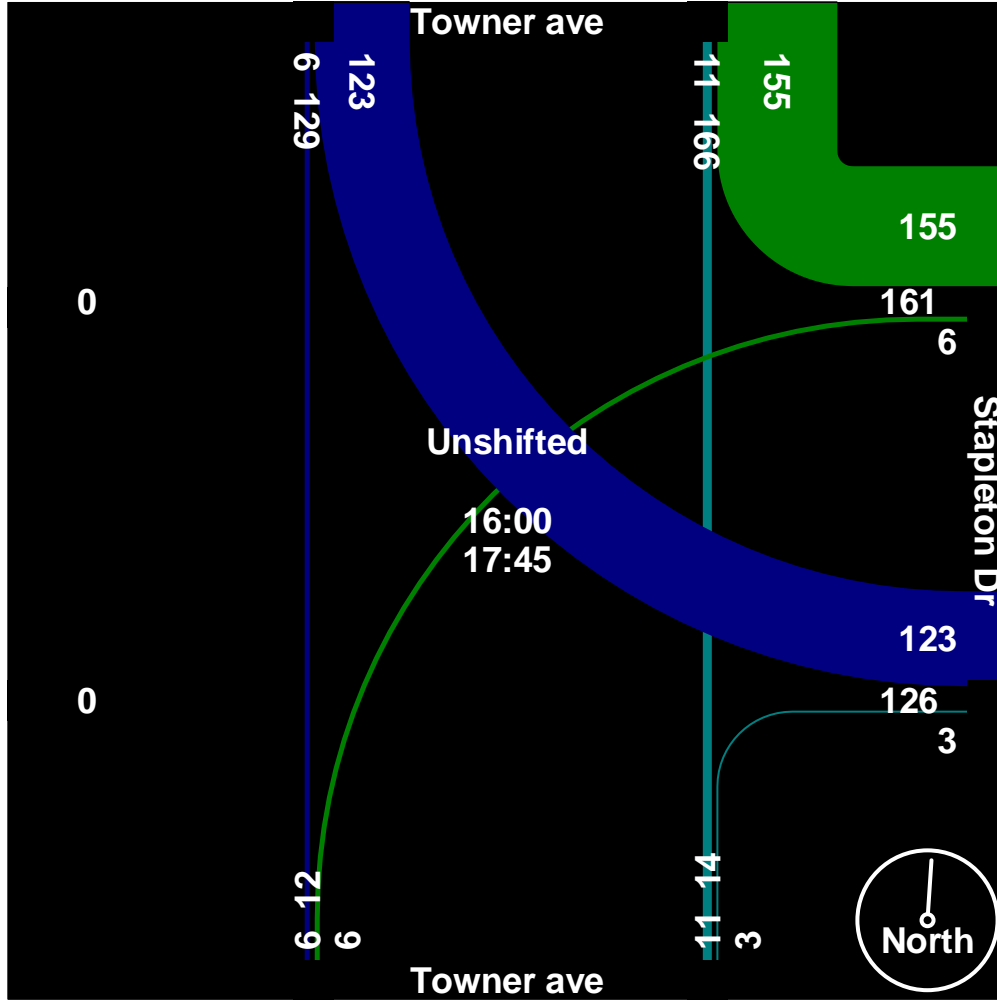
Start Time	Towner ave Southbound					Stapleton Dr Westbound					Towner ave Northbound					Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
16:00	16	0	0	0	16	0	0	10	0	10	0	1	0	0	1	0	0	0	0	0	0	27
16:15	16	2	0	0	18	0	0	34	0	34	0	1	1	0	2	0	0	0	0	0	0	54
16:30	12	0	0	0	12	1	0	26	0	27	0	3	0	0	3	0	0	0	0	0	0	42
16:45	17	0	0	0	17	2	0	25	0	27	0	1	0	0	1	0	0	0	0	0	0	45
Total	61	2	0	0	63	3	0	95	0	98	0	6	1	0	7	0	0	0	0	0	0	168
17:00	29	2	0	0	31	1	0	18	0	19	0	1	1	0	2	0	0	0	0	0	0	52
17:15	13	1	0	0	14	0	0	14	0	14	0	3	1	0	4	0	0	0	0	0	0	32
17:30	11	1	0	0	12	1	0	16	0	17	0	0	0	0	0	0	0	0	0	0	0	29
17:45	9	0	0	0	9	1	0	12	0	13	0	1	0	0	1	0	0	0	0	0	0	23
Total	62	4	0	0	66	3	0	60	0	63	0	5	2	0	7	0	0	0	0	0	0	136

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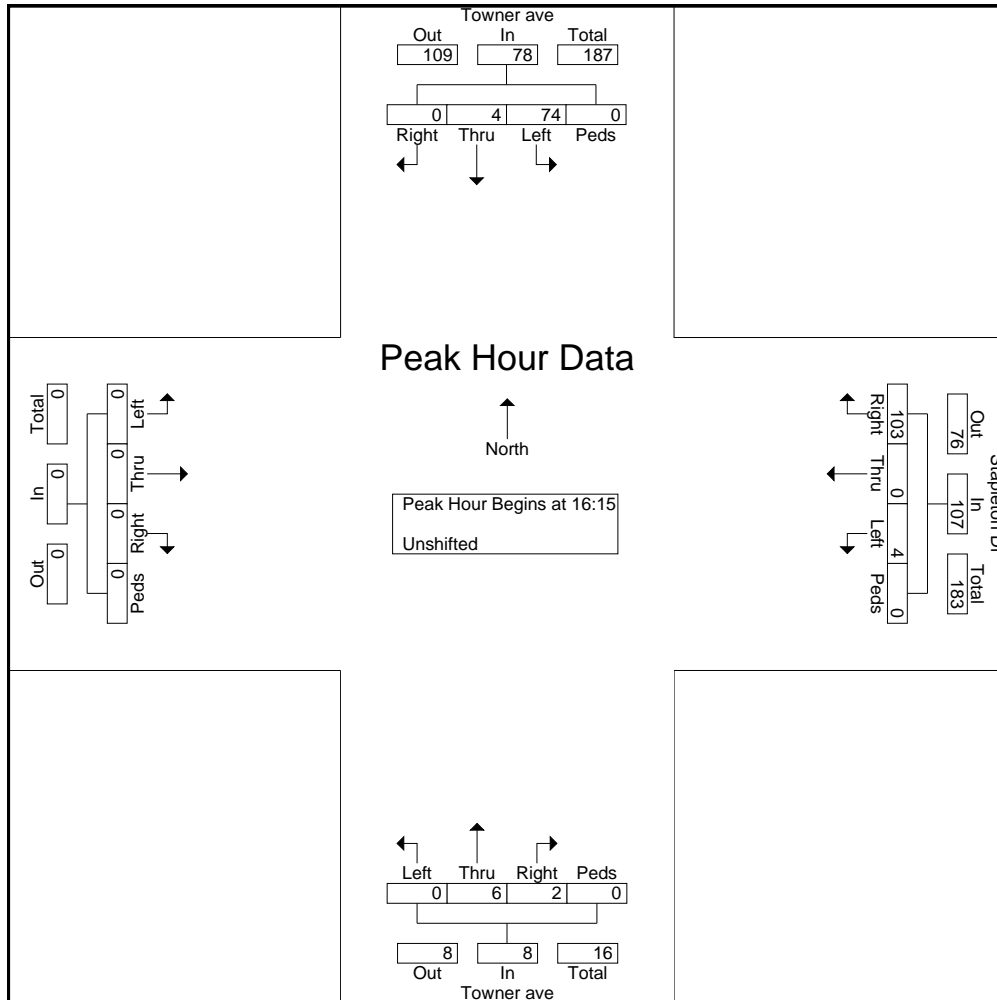
	Towner ave Southbound					Stapleton Dr Westbound					Towner ave Northbound					Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Grand Total	123	6	0	0	129	6	0	155	0	161	0	11	3	0	14	0	0	0	0	0	0	304
Apprch %	95.3	4.7	0	0		3.7	0	96.3	0		0	78.6	21.4	0		0	0	0	0			
Total %	40.5	2	0	0	42.4	2	0	51	0	53	0	3.6	1	0	4.6	0	0	0	0			

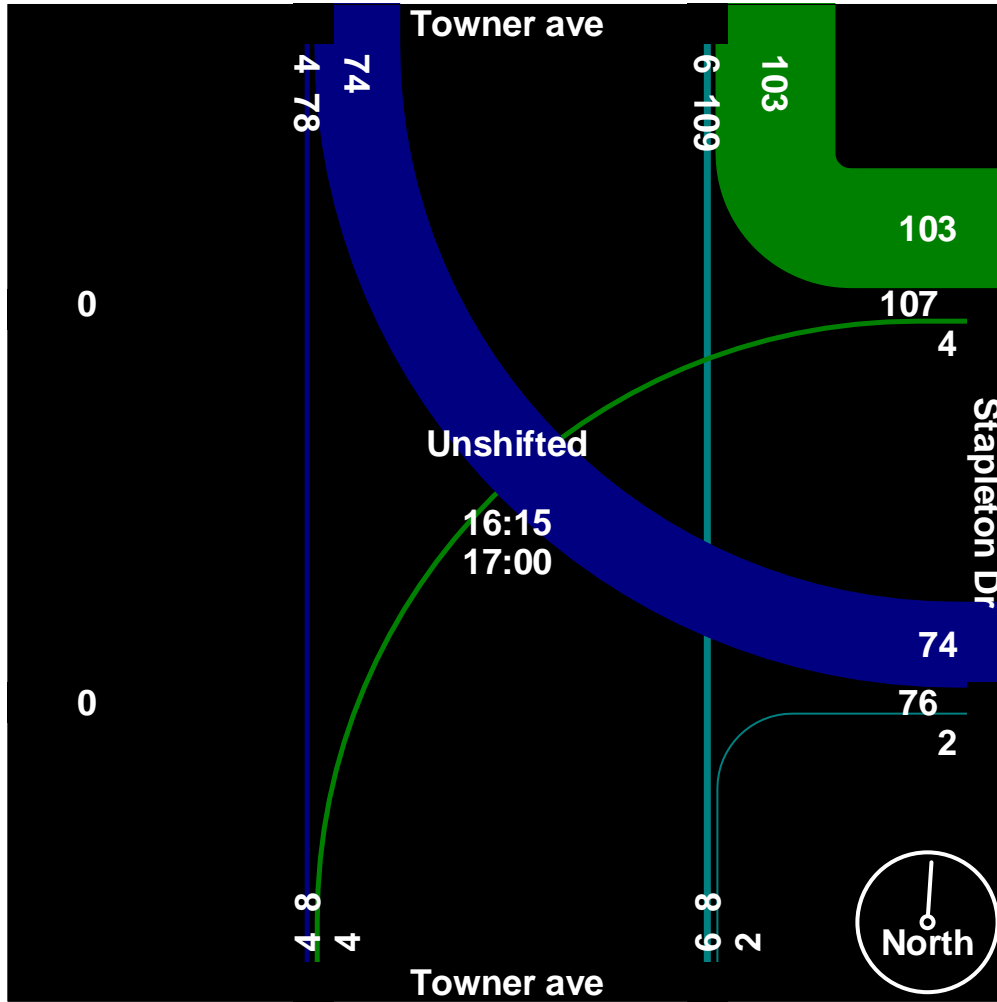


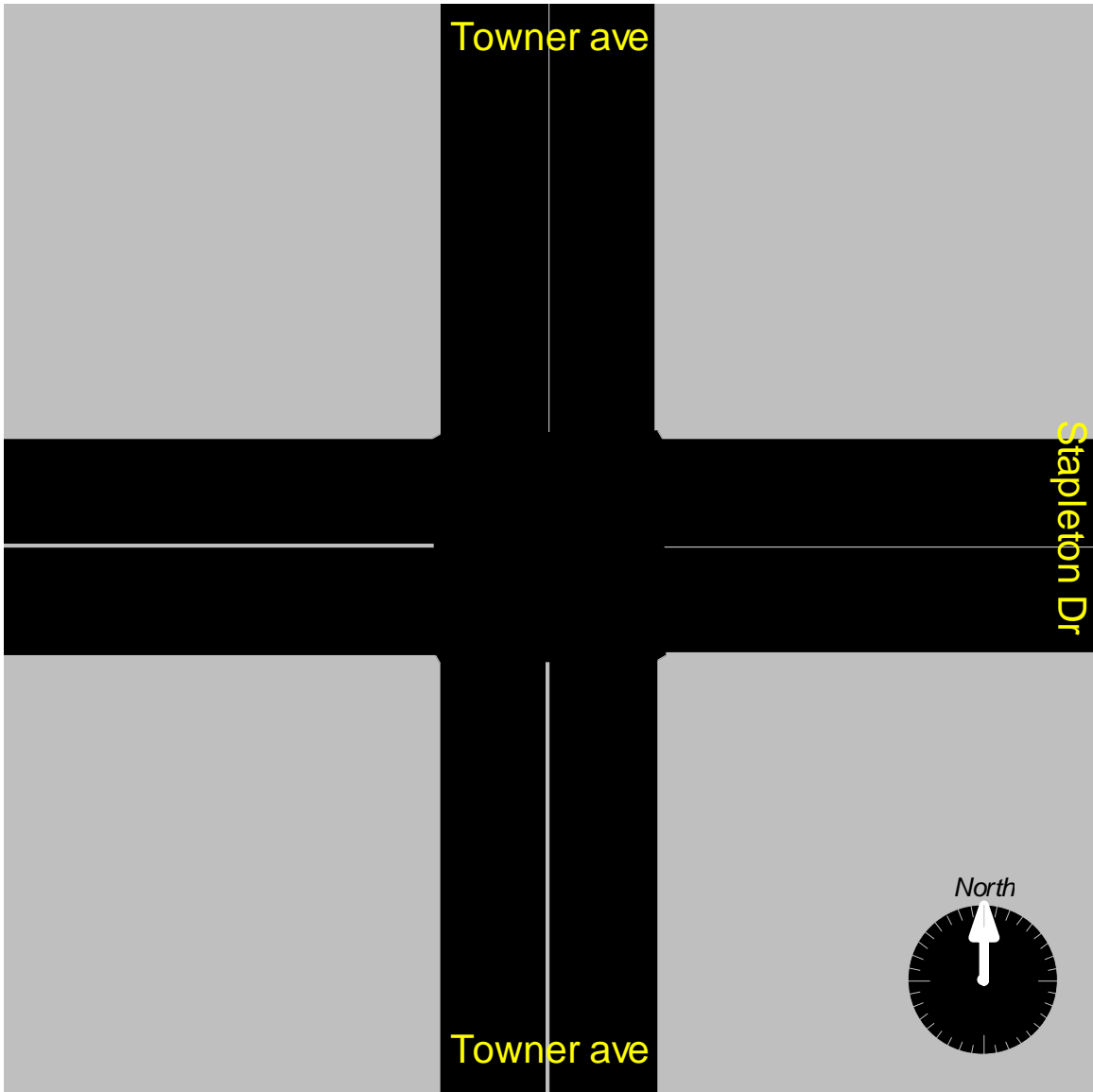


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Start Time	Towner ave Southbound					Stapleton Dr Westbound					Towner ave Northbound					Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:15																					
16:15	16	2	0	0	18	0	0	34	0	34	0	1	1	0	2	0	0	0	0	0	54
16:30	12	0	0	0	12	1	0	26	0	27	0	3	0	0	3	0	0	0	0	0	42
16:45	17	0	0	0	17	2	0	25	0	27	0	1	0	0	1	0	0	0	0	0	45
17:00	29	2	0	0	31	1	0	18	0	19	0	1	1	0	2	0	0	0	0	0	52
Total Volume	74	4	0	0	78	4	0	103	0	107	0	6	2	0	8	0	0	0	0	0	193
% App. Total	94.9	5.1	0	0		3.7	0	96.3	0		0	75	25	0		0	0	0	0		
PHF	.638	.500	.000	.000	.629	.500	.000	.757	.000	.787	.000	.500	.500	.000	.667	.000	.000	.000	.000	.000	.894







HCM 6th TWSC
5: Towner Ave & Londonderry Dr/Londonderry Dr (North)

Existing Traffic
AM Peak Hour

Intersection

Int Delay, s/veh 8.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	↷
Traffic Vol, veh/h	71	8	197	44	8	223
Future Vol, veh/h	71	8	197	44	8	223
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	51	51	77	77	48	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	139	16	256	57	17	465

Major/Minor

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	155	0	716 147
Stage 1	-	-	-	-	147 -
Stage 2	-	-	-	-	569 -
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	-	-	1425	-	397 900
Stage 1	-	-	-	-	880 -
Stage 2	-	-	-	-	566 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1425	-	326 900
Mov Cap-2 Maneuver	-	-	-	-	326 -
Stage 1	-	-	-	-	722 -
Stage 2	-	-	-	-	566 -

Approach

	EB	WB	NB
HCM Control Delay, s	0	6.6	13.3
HCM LOS			B

Minor Lane/Major Mvmt

	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	326	900	-	-	1425	-
HCM Lane V/C Ratio	0.051	0.516	-	-	0.18	-
HCM Control Delay (s)	16.6	13.2	-	-	8.1	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	3	-	-	0.7	-

HCM 6th TWSC
 6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

Existing Traffic
 AM Peak Hour




Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	9	4	89	11	0	16	24	266	14	12	141	3
Future Vol, veh/h	9	4	89	11	0	16	24	266	14	12	141	3
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	43	43	43	66	66	66	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	5	111	26	0	37	36	403	21	12	141	3

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	671	663	143	711	654	414	144	0	0	424	0	0
Stage 1	167	167	-	486	486	-	-	-	-	-	-	-
Stage 2	504	496	-	225	168	-	-	-	-	-	-	-
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	370	382	905	348	386	638	1438	-	-	1135	-	-
Stage 1	835	760	-	563	551	-	-	-	-	-	-	-
Stage 2	550	545	-	778	759	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	339	368	905	294	372	638	1438	-	-	1135	-	-
Mov Cap-2 Maneuver	339	368	-	294	372	-	-	-	-	-	-	-
Stage 1	814	752	-	549	537	-	-	-	-	-	-	-
Stage 2	505	531	-	671	751	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.8		14.7		0.6		0.6	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1438	-	-	751	432	1135	-	-
HCM Lane V/C Ratio	0.025	-	-	0.17	0.145	0.011	-	-
HCM Control Delay (s)	7.6	-	-	10.8	14.7	8.2	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.5	0	-	-

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	290	22	4	217	15
Future Vol, veh/h	2	290	22	4	217	15
Peak Hour Factor	0.61	0.61	0.72	0.72	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	475	31	6	236	16
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	12	8.6	11.2
HCM LOS	B	A	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	1%	94%
Vol Thru, %	85%	0%	6%
Vol Right, %	15%	99%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	26	292	232
LT Vol	0	2	217
Through Vol	22	0	15
RT Vol	4	290	0
Lane Flow Rate	36	479	252
Geometry Grp	1	1	1
Degree of Util (X)	0.052	0.546	0.363
Departure Headway (Hd)	5.214	4.104	5.181
Convergence, Y/N	Yes	Yes	Yes
Cap	679	876	688
Service Time	3.304	2.133	3.256
HCM Lane V/C Ratio	0.053	0.547	0.366
HCM Control Delay	8.6	12	11.2
HCM Lane LOS	A	B	B
HCM 95th-tile Q	0.2	3.4	1.7

Intersection

Int Delay, s/veh 7.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	42	5	86	42	6	120
Future Vol, veh/h	42	5	86	42	6	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	100	100	40	40
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	6	86	42	15	300

Major/Minor

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	56	0	267 53
Stage 1	-	-	-	-	53 -
Stage 2	-	-	-	-	214 -
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	-	-	1549	-	722 1014
Stage 1	-	-	-	-	970 -
Stage 2	-	-	-	-	822 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1549	-	682 1014
Mov Cap-2 Maneuver	-	-	-	-	682 -
Stage 1	-	-	-	-	916 -
Stage 2	-	-	-	-	822 -

Approach

	EB	WB	NB
HCM Control Delay, s	0	5	10
HCM LOS			B

Minor Lane/Major Mvmt

	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	682	1014	-	-	1549	-
HCM Lane V/C Ratio	0.022	0.296	-	-	0.056	-
HCM Control Delay (s)	10.4	10	-	-	7.5	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	1.2	-	-	0.2	-

HCM 6th TWSC
 6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

Existing Traffic
 School PM Peak Hour

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	7	12	73	11	0	11	61	104	17	1	99	8
Future Vol, veh/h	7	12	73	11	0	11	61	104	17	1	99	8
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	52	52	52	31	31	31	95	95	95	47	47	47
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	23	140	35	0	35	64	109	18	2	211	17

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	488	479	220	551	478	118	228	0	0	127	0	0
Stage 1	224	224	-	246	246	-	-	-	-	-	-	-
Stage 2	264	255	-	305	232	-	-	-	-	-	-	-
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	490	486	820	445	486	934	1340	-	-	1459	-	-
Stage 1	779	718	-	758	703	-	-	-	-	-	-	-
Stage 2	741	696	-	705	713	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	454	462	820	342	462	934	1340	-	-	1459	-	-
Mov Cap-2 Maneuver	454	462	-	342	462	-	-	-	-	-	-	-
Stage 1	742	717	-	722	669	-	-	-	-	-	-	-
Stage 2	679	663	-	565	712	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.8		13.4		2.6		0.1	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1340	-	-	705	501	1459	-	-
HCM Lane V/C Ratio	0.048	-	-	0.251	0.142	0.001	-	-
HCM Control Delay (s)	7.8	-	-	11.8	13.4	7.5	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1	0.5	0	-	-

HCM 6th TWSC
5: Towner Ave & Londonderry Dr/Londonderry Dr (North)

Existing Traffic
PM Peak Hour

Intersection

Int Delay, s/veh 6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	12	1	60	21	2	67
Future Vol, veh/h	12	1	60	21	2	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	88	88	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	1	68	24	3	93

Major/Minor

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	16	0	176
Stage 1	-	-	-	-	16
Stage 2	-	-	-	-	160
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1602	-	814
Stage 1	-	-	-	-	1007
Stage 2	-	-	-	-	869
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1602	-	780
Mov Cap-2 Maneuver	-	-	-	-	780
Stage 1	-	-	-	-	965
Stage 2	-	-	-	-	869

Approach

	EB	WB	NB
HCM Control Delay, s	0	5.4	8.7
HCM LOS			A

Minor Lane/Major Mvmt

	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	780	1063	-	-	1602	-
HCM Lane V/C Ratio	0.004	0.088	-	-	0.043	-
HCM Control Delay (s)	9.6	8.7	-	-	7.3	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0.3	-	-	0.1	-

HCM 6th TWSC
 6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

Existing Traffic
 PM Peak Hour




Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	3	8	36	27	4	7	73	88	36	5	93	7
Future Vol, veh/h	3	8	36	27	4	7	73	88	36	5	93	7
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	59	59	59	90	90	90	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	10	43	46	7	12	81	98	40	6	109	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	415	425	113	432	409	118	117	0	0	138	0	0
Stage 1	125	125	-	280	280	-	-	-	-	-	-	-
Stage 2	290	300	-	152	129	-	-	-	-	-	-	-
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	548	521	940	534	532	934	1471	-	-	1446	-	-
Stage 1	879	792	-	727	679	-	-	-	-	-	-	-
Stage 2	718	666	-	850	789	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	511	490	940	480	501	934	1471	-	-	1446	-	-
Mov Cap-2 Maneuver	511	490	-	480	501	-	-	-	-	-	-	-
Stage 1	831	789	-	687	642	-	-	-	-	-	-	-
Stage 2	663	629	-	798	786	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10		12.7		2.8		0.4	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1471	-	-	777	530	1446	-
HCM Lane V/C Ratio	0.055	-	-	0.072	0.122	0.004	-
HCM Control Delay (s)	7.6	-	-	10	12.7	7.5	-
HCM Lane LOS	A	-	-	B	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.4	0	-

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	103	6	2	74	4
Future Vol, veh/h	4	103	6	2	74	4
Peak Hour Factor	0.79	0.79	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	130	6	2	74	4
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.1	7.2	7.9
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	4%	95%
Vol Thru, %	75%	0%	5%
Vol Right, %	25%	96%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	8	107	78
LT Vol	0	4	74
Through Vol	6	0	4
RT Vol	2	103	0
Lane Flow Rate	8	135	78
Geometry Grp	1	1	1
Degree of Util (X)	0.009	0.132	0.095
Departure Headway (Hd)	4.081	3.511	4.367
Convergence, Y/N	Yes	Yes	Yes
Cap	872	1012	821
Service Time	2.128	1.566	2.393
HCM Lane V/C Ratio	0.009	0.133	0.095
HCM Control Delay	7.2	7.1	7.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.5	0.3

Intersection						
Int Delay, s/veh	10.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	195	8	199	86	8	228
Future Vol, veh/h	195	8	199	86	8	228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	51	51	77	77	48	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	382	16	258	112	17	475

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	398	0	1018
Stage 1	-	-	-	-	390
Stage 2	-	-	-	-	628
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1161	-	263
Stage 1	-	-	-	-	684
Stage 2	-	-	-	-	532
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1161	-	205
Mov Cap-2 Maneuver	-	-	-	-	205
Stage 1	-	-	-	-	532
Stage 2	-	-	-	-	532

Approach	EB	WB	NB
HCM Control Delay, s	0	6.3	23.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	205	658	-	-	1161	-
HCM Lane V/C Ratio	0.081	0.722	-	-	0.223	-
HCM Control Delay (s)	24.1	23.3	-	-	9	-
HCM Lane LOS	C	C	-	-	A	-
HCM 95th %tile Q(veh)	0.3	6.1	-	-	0.9	-




Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	9	4	134	10	0	16	39	278	14	12	177	3
Future Vol, veh/h	9	4	134	10	0	16	39	278	14	12	177	3
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	43	43	43	66	66	66	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	5	168	23	0	37	59	421	21	12	177	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	771	763	179	839	754	432	180	0	0	442	0	0
Stage 1	203	203	-	550	550	-	-	-	-	-	-	-
Stage 2	568	560	-	289	204	-	-	-	-	-	-	-
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	317	334	864	285	338	624	1396	-	-	1118	-	-
Stage 1	799	733	-	519	516	-	-	-	-	-	-	-
Stage 2	508	511	-	719	733	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	286	316	864	218	320	624	1396	-	-	1118	-	-
Mov Cap-2 Maneuver	286	316	-	218	320	-	-	-	-	-	-	-
Stage 1	765	725	-	497	494	-	-	-	-	-	-	-
Stage 2	458	490	-	569	725	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.5		16.9		0.9		0.5	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1396	-	-	738	364	1118	-	-
HCM Lane V/C Ratio	0.042	-	-	0.249	0.166	0.011	-	-
HCM Control Delay (s)	7.7	-	-	11.5	16.9	8.3	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.6	0	-	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	309	22	4	307	15
Future Vol, veh/h	2	309	22	4	307	15
Peak Hour Factor	0.61	0.61	0.72	0.72	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	507	31	6	334	16
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	14.4	9	14.3
HCM LOS	B	A	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	1%	95%
Vol Thru, %	85%	0%	5%
Vol Right, %	15%	99%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	26	311	322
LT Vol	0	2	307
Through Vol	22	0	15
RT Vol	4	309	0
Lane Flow Rate	36	510	350
Geometry Grp	1	1	1
Degree of Util (X)	0.056	0.62	0.526
Departure Headway (Hd)	5.628	4.376	5.411
Convergence, Y/N	Yes	Yes	Yes
Cap	639	816	672
Service Time	3.641	2.451	3.412
HCM Lane V/C Ratio	0.056	0.625	0.521
HCM Control Delay	9	14.4	14.3
HCM Lane LOS	A	B	B
HCM 95th-tile Q	0.2	4.4	3.1

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	40	0	6	22	8	0	0	18	22	0	1
Future Vol, veh/h	0	40	0	6	22	8	0	0	18	22	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	43	0	7	24	9	0	0	20	24	0	1

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	33	0	0	43	0	0	86	90	43	96	86	29
Stage 1	-	-	-	-	-	-	43	43	-	43	43	-
Stage 2	-	-	-	-	-	-	43	47	-	53	43	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1579	-	-	1566	-	-	900	800	1027	887	804	1046
Stage 1	-	-	-	-	-	-	971	859	-	971	859	-
Stage 2	-	-	-	-	-	-	971	856	-	960	859	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1579	-	-	1566	-	-	896	796	1027	867	800	1046
Mov Cap-2 Maneuver	-	-	-	-	-	-	896	796	-	867	800	-
Stage 1	-	-	-	-	-	-	971	859	-	971	855	-
Stage 2	-	-	-	-	-	-	965	852	-	942	859	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		1.2		8.6		9.2	
HCM LOS					A		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1027	1579	-	-	1566	-	-	873
HCM Lane V/C Ratio	0.019	-	-	-	0.004	-	-	0.029
HCM Control Delay (s)	8.6	0	-	-	7.3	0	-	9.2
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	0	14	2	0	9	4	17	1	3	13	8
Future Vol, veh/h	14	0	14	2	0	9	4	17	1	3	13	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	0	15	2	0	10	4	18	1	3	14	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	57	52	19	59	56	19	23	0	0	19	0	0
Stage 1	25	25	-	27	27	-	-	-	-	-	-	-
Stage 2	32	27	-	32	29	-	-	-	-	-	-	-
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	940	839	1059	937	835	1059	1592	-	-	1597	-	-
Stage 1	993	874	-	990	873	-	-	-	-	-	-	-
Stage 2	984	873	-	984	871	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	928	835	1059	920	831	1059	1592	-	-	1597	-	-
Mov Cap-2 Maneuver	928	835	-	920	831	-	-	-	-	-	-	-
Stage 1	990	872	-	987	870	-	-	-	-	-	-	-
Stage 2	972	870	-	968	869	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	8.8		8.5		1.3		0.9	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1592	-	-	989	1031	1597	-	-
HCM Lane V/C Ratio	0.003	-	-	0.031	0.012	0.002	-	-
HCM Control Delay (s)	7.3	0	-	8.8	8.5	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection						
Int Delay, s/veh	3.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	1	65	159	2	70
Future Vol, veh/h	94	1	65	159	2	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	88	88	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	1	74	181	3	97

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	117	0	446 117
Stage 1	-	-	-	-	117 -
Stage 2	-	-	-	-	329 -
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	-	-	1471	-	570 935
Stage 1	-	-	-	-	908 -
Stage 2	-	-	-	-	729 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1471	-	542 935
Mov Cap-2 Maneuver	-	-	-	-	542 -
Stage 1	-	-	-	-	863 -
Stage 2	-	-	-	-	729 -

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	542	935	-	-	1471	-
HCM Lane V/C Ratio	0.005	0.104	-	-	0.05	-
HCM Control Delay (s)	11.7	9.3	-	-	7.6	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0.3	-	-	0.2	-

HCM 6th TWSC
6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

Short-Term Background Traffic
PM Peak Hour




Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Vol, veh/h	3	8	66	27	4	7	123	128	36	5	117	7
Future Vol, veh/h	3	8	66	27	4	7	123	128	36	5	117	7
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	59	59	59	90	90	90	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	10	79	46	7	12	137	142	40	6	138	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	600	610	142	635	594	162	146	0	0	182	0	0
Stage 1	154	154	-	436	436	-	-	-	-	-	-	-
Stage 2	446	456	-	199	158	-	-	-	-	-	-	-
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	413	409	906	391	418	883	1436	-	-	1393	-	-
Stage 1	848	770	-	599	580	-	-	-	-	-	-	-
Stage 2	591	568	-	803	767	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	371	369	906	324	377	883	1436	-	-	1393	-	-
Mov Cap-2 Maneuver	371	369	-	324	377	-	-	-	-	-	-	-
Stage 1	767	767	-	542	525	-	-	-	-	-	-	-
Stage 2	521	514	-	721	764	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	16.7	3.3	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1436	-	-	750	373	1393	-	-
HCM Lane V/C Ratio	0.095	-	-	0.122	0.173	0.004	-	-
HCM Control Delay (s)	7.8	-	-	10.5	16.7	7.6	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.4	0.6	0	-	-

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	281	6	2	206	4
Future Vol, veh/h	4	281	6	2	206	4
Peak Hour Factor	0.79	0.79	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	356	6	2	206	4
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.4	7.9	9.9
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	1%	98%
Vol Thru, %	75%	0%	2%
Vol Right, %	25%	99%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	8	285	210
LT Vol	0	4	206
Through Vol	6	0	4
RT Vol	2	281	0
Lane Flow Rate	8	361	210
Geometry Grp	1	1	1
Degree of Util (X)	0.011	0.391	0.284
Departure Headway (Hd)	4.794	3.903	4.877
Convergence, Y/N	Yes	Yes	Yes
Cap	744	924	735
Service Time	2.838	1.917	2.914
HCM Lane V/C Ratio	0.011	0.391	0.286
HCM Control Delay	7.9	9.4	9.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	1.9	1.2

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	10	0	21	26	25	0	0	12	14	0	1
Future Vol, veh/h	2	10	0	21	26	25	0	0	12	14	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	11	0	23	28	27	0	0	13	15	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	55	0	0	11	0	0	103	116	11	110	103	42
Stage 1	-	-	-	-	-	-	15	15	-	88	88	-
Stage 2	-	-	-	-	-	-	88	101	-	22	15	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1550	-	-	1608	-	-	877	774	1070	868	787	1029
Stage 1	-	-	-	-	-	-	1005	883	-	920	822	-
Stage 2	-	-	-	-	-	-	920	811	-	996	883	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1550	-	-	1608	-	-	866	762	1070	847	774	1029
Mov Cap-2 Maneuver	-	-	-	-	-	-	866	762	-	847	774	-
Stage 1	-	-	-	-	-	-	1004	882	-	919	810	-
Stage 2	-	-	-	-	-	-	905	799	-	983	882	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.2			2.1			8.4			9.3		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1070	1550	-	-	1608	-	-	857
HCM Lane V/C Ratio	0.012	0.001	-	-	0.014	-	-	0.019
HCM Control Delay (s)	8.4	7.3	0	-	7.3	0	-	9.3
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	0	9	2	0	6	14	2	3	10	9	8
Future Vol, veh/h	3	0	9	2	0	6	14	2	3	10	9	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	10	2	0	7	15	2	3	11	10	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	74	72	15	76	75	4	19	0	0	5	0	0
Stage 1	37	37	-	34	34	-	-	-	-	-	-	-
Stage 2	37	35	-	42	41	-	-	-	-	-	-	-
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	916	818	1065	914	815	1080	1597	-	-	1616	-	-
Stage 1	978	864	-	982	867	-	-	-	-	-	-	-
Stage 2	978	866	-	972	861	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	900	805	1065	895	802	1080	1597	-	-	1616	-	-
Mov Cap-2 Maneuver	900	805	-	895	802	-	-	-	-	-	-	-
Stage 1	969	858	-	973	859	-	-	-	-	-	-	-
Stage 2	963	858	-	956	855	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	8.6		8.5		5.4		2.7	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1597	-	-	1018	1027	1616	-	-
HCM Lane V/C Ratio	0.01	-	-	0.013	0.008	0.007	-	-
HCM Control Delay (s)	7.3	0	-	8.6	8.5	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection						
Int Delay, s/veh	10.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	280	8	199	114	8	228
Future Vol, veh/h	280	8	199	114	8	228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	51	77	77	48	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	373	16	258	148	17	475

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	389	0	1045 381
Stage 1	-	-	-	-	381 -
Stage 2	-	-	-	-	664 -
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	-	-	1170	-	253 666
Stage 1	-	-	-	-	691 -
Stage 2	-	-	-	-	512 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1170	-	197 666
Mov Cap-2 Maneuver	-	-	-	-	197 -
Stage 1	-	-	-	-	538 -
Stage 2	-	-	-	-	512 -

Approach	EB	WB	NB
HCM Control Delay, s	0	5.7	22.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	197	666	-	-	1170	-
HCM Lane V/C Ratio	0.085	0.713	-	-	0.221	-
HCM Control Delay (s)	25	22.7	-	-	8.9	-
HCM Lane LOS	D	C	-	-	A	-
HCM 95th %tile Q(veh)	0.3	6	-	-	0.8	-




Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	9	4	172	10	0	16	52	278	14	12	177	3
Future Vol, veh/h	9	4	172	10	0	16	52	278	14	12	177	3
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	43	43	43	66	66	66	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	5	215	23	0	37	79	421	21	12	177	3

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	811	803	179	903	794	432	180	0	0	442	0	0
Stage 1	203	203	-	590	590	-	-	-	-	-	-	-
Stage 2	608	600	-	313	204	-	-	-	-	-	-	-
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	298	317	864	258	321	624	1396	-	-	1118	-	-
Stage 1	799	733	-	494	495	-	-	-	-	-	-	-
Stage 2	483	490	-	698	733	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	266	296	864	182	299	624	1396	-	-	1118	-	-
Mov Cap-2 Maneuver	266	296	-	182	299	-	-	-	-	-	-	-
Stage 1	753	725	-	466	467	-	-	-	-	-	-	-
Stage 2	428	462	-	515	725	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.9		18.7		1.2		0.5	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1396	-	-	751	323	1118	-	-
HCM Lane V/C Ratio	0.056	-	-	0.308	0.187	0.011	-	-
HCM Control Delay (s)	7.7	-	-	11.9	18.7	8.3	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.3	0.7	0	-	-

Intersection	
Intersection Delay, s/veh	15.9
Intersection LOS	C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	322	22	4	345	15
Future Vol, veh/h	2	322	22	4	345	15
Peak Hour Factor	0.61	0.61	0.72	0.72	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	528	31	6	375	16
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	16.1	9.2	16.3
HCM LOS	C	A	C

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	1%	96%
Vol Thru, %	85%	0%	4%
Vol Right, %	15%	99%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	26	324	360
LT Vol	0	2	345
Through Vol	22	0	15
RT Vol	4	322	0
Lane Flow Rate	36	531	391
Geometry Grp	1	1	1
Degree of Util (X)	0.058	0.663	0.598
Departure Headway (Hd)	5.798	4.494	5.499
Convergence, Y/N	Yes	Yes	Yes
Cap	620	791	661
Service Time	3.815	2.591	3.501
HCM Lane V/C Ratio	0.058	0.671	0.592
HCM Control Delay	9.2	16.1	16.3
HCM Lane LOS	A	C	C
HCM 95th-tile Q	0.2	5.1	4

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	106	0	6	44	14	0	0	18	42	0	7
Future Vol, veh/h	2	106	0	6	44	14	0	0	18	42	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	115	0	7	48	15	0	0	20	46	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	115	0	0	193	196	115	199	189	56
Stage 1	-	-	-	-	-	-	119	119	-	70	70	-
Stage 2	-	-	-	-	-	-	74	77	-	129	119	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1540	-	-	1474	-	-	767	699	937	760	706	1011
Stage 1	-	-	-	-	-	-	885	797	-	940	837	-
Stage 2	-	-	-	-	-	-	935	831	-	875	797	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1540	-	-	1474	-	-	758	695	937	741	702	1011
Mov Cap-2 Maneuver	-	-	-	-	-	-	758	695	-	741	702	-
Stage 1	-	-	-	-	-	-	884	796	-	939	833	-
Stage 2	-	-	-	-	-	-	923	827	-	856	796	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.7			8.9			10		
HCM LOS							A			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	937	1540	-	-	1474	-	-	770
HCM Lane V/C Ratio	0.021	0.001	-	-	0.004	-	-	0.069
HCM Control Delay (s)	8.9	7.3	0	-	7.5	0	-	10
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

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	80	0	46	2	0	9	15	19	1	3	18	30
Future Vol, veh/h	80	0	46	2	0	9	15	19	1	3	18	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	0	50	2	0	10	16	21	1	3	20	33

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	102	97	37	122	113	22	53	0	0	22	0	0
Stage 1	43	43	-	54	54	-	-	-	-	-	-	-
Stage 2	59	54	-	68	59	-	-	-	-	-	-	-
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	879	793	1035	853	777	1055	1553	-	-	1593	-	-
Stage 1	971	859	-	958	850	-	-	-	-	-	-	-
Stage 2	953	850	-	942	846	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	863	783	1035	804	768	1055	1553	-	-	1593	-	-
Mov Cap-2 Maneuver	863	783	-	804	768	-	-	-	-	-	-	-
Stage 1	961	857	-	948	842	-	-	-	-	-	-	-
Stage 2	935	842	-	895	844	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.6		8.7		3.1		0.4	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1553	-	-	919	998	1593	-	-
HCM Lane V/C Ratio	0.01	-	-	0.149	0.012	0.002	-	-
HCM Control Delay (s)	7.3	0	-	9.6	8.7	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-	-

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	150	1	65	256	2	70
Future Vol, veh/h	150	1	65	256	2	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	88	88	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	185	1	74	291	3	97

Major/Minor

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	186	0	625
Stage 1	-	-	-	-	186
Stage 2	-	-	-	-	439
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1388	-	449
Stage 1	-	-	-	-	846
Stage 2	-	-	-	-	650
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1388	-	425
Mov Cap-2 Maneuver	-	-	-	-	425
Stage 1	-	-	-	-	801
Stage 2	-	-	-	-	650

Approach

	EB	WB	NB
HCM Control Delay, s	0	1.6	9.8
HCM LOS			A

Minor Lane/Major Mvmt

	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	425	856	-	-	1388	-
HCM Lane V/C Ratio	0.007	0.114	-	-	0.053	-
HCM Control Delay (s)	13.5	9.7	-	-	7.7	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0.4	-	-	0.2	-

HCM 6th TWSC
 6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

Short-Term Total Traffic
 PM Peak Hour

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	3	8	91	27	4	7	166	128	36	5	117	7
Future Vol, veh/h	3	8	91	27	4	7	166	128	36	5	117	7
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	59	59	59	90	90	90	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	10	108	46	7	12	184	142	40	6	138	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	694	704	142	743	688	162	146	0	0	182	0	0
Stage 1	154	154	-	530	530	-	-	-	-	-	-	-
Stage 2	540	550	-	213	158	-	-	-	-	-	-	-
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	357	361	906	331	369	883	1436	-	-	1393	-	-
Stage 1	848	770	-	533	527	-	-	-	-	-	-	-
Stage 2	526	516	-	789	767	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	312	314	906	256	321	883	1436	-	-	1393	-	-
Mov Cap-2 Maneuver	312	314	-	256	321	-	-	-	-	-	-	-
Stage 1	739	767	-	465	460	-	-	-	-	-	-	-
Stage 2	446	450	-	683	764	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	20.1	4	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1436	-	-	753	302	1393	-
HCM Lane V/C Ratio	0.128	-	-	0.161	0.213	0.004	-
HCM Control Delay (s)	7.9	-	-	10.7	20.1	7.6	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.6	0.8	0	-

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	53	0	21	100	47	0	0	12	28	0	4
Future Vol, veh/h	8	53	0	21	100	47	0	0	12	28	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	58	0	23	109	51	0	0	13	30	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	160	0	0	58	0	0	259	282	58	264	257	135
Stage 1	-	-	-	-	-	-	76	76	-	181	181	-
Stage 2	-	-	-	-	-	-	183	206	-	83	76	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1419	-	-	1546	-	-	694	627	1008	689	647	914
Stage 1	-	-	-	-	-	-	933	832	-	821	750	-
Stage 2	-	-	-	-	-	-	819	731	-	925	832	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1419	-	-	1546	-	-	679	613	1008	668	632	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	679	613	-	668	632	-
Stage 1	-	-	-	-	-	-	926	826	-	815	738	-
Stage 2	-	-	-	-	-	-	802	719	-	907	826	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1			0.9			8.6			10.5		
HCM LOS							A			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1008	1419	-	-	1546	-	-	691
HCM Lane V/C Ratio	0.013	0.006	-	-	0.015	-	-	0.05
HCM Control Delay (s)	8.6	7.6	0	-	7.4	0	-	10.5
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	47	0	30	2	0	6	51	8	3	10	12	82
Future Vol, veh/h	47	0	30	2	0	6	51	8	3	10	12	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	51	0	33	2	0	7	55	9	3	11	13	89

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	204	202	58	217	245	11	102	0	0	12	0	0
Stage 1	80	80	-	121	121	-	-	-	-	-	-	-
Stage 2	124	122	-	96	124	-	-	-	-	-	-	-
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	754	694	1008	739	657	1070	1490	-	-	1607	-	-
Stage 1	929	828	-	883	796	-	-	-	-	-	-	-
Stage 2	880	795	-	911	793	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	725	663	1008	691	628	1070	1490	-	-	1607	-	-
Mov Cap-2 Maneuver	725	663	-	691	628	-	-	-	-	-	-	-
Stage 1	895	822	-	850	767	-	-	-	-	-	-	-
Stage 2	842	766	-	875	787	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	8.9	6.2	0.7
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1490	-	-	814	941	1607	-	-
HCM Lane V/C Ratio	0.037	-	-	0.103	0.009	0.007	-	-
HCM Control Delay (s)	7.5	0	-	9.9	8.9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0	0	-	-

Intersection						
Int Delay, s/veh	10.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	149	57	288	80	26	260
Future Vol, veh/h	149	57	288	80	26	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	51	77	92	92	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	162	112	374	87	28	542

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	274	0	1053 218
Stage 1	-	-	-	-	218 -
Stage 2	-	-	-	-	835 -
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	-	-	1289	-	251 822
Stage 1	-	-	-	-	818 -
Stage 2	-	-	-	-	426 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1289	-	178 822
Mov Cap-2 Maneuver	-	-	-	-	178 -
Stage 1	-	-	-	-	581 -
Stage 2	-	-	-	-	426 -

Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	178	822	-	-	1289	-
HCM Lane V/C Ratio	0.159	0.659	-	-	0.29	-
HCM Control Delay (s)	29	17.4	-	-	8.9	-
HCM Lane LOS	D	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	5.1	-	-	1.2	-

HCM 6th TWSC
6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

2040 Background Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Vol, veh/h	9	4	142	10	0	16	42	342	14	12	328	3
Future Vol, veh/h	9	4	142	10	0	16	42	342	14	12	328	3
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	43	43	43	66	66	66	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	5	178	23	0	37	64	518	21	12	328	3

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1029	1021	330	1102	1012	529	331	0	0	539	0	0
Stage 1	354	354	-	657	657	-	-	-	-	-	-	-
Stage 2	675	667	-	445	355	-	-	-	-	-	-	-
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	212	236	712	189	239	550	1228	-	-	1029	-	-
Stage 1	663	630	-	454	462	-	-	-	-	-	-	-
Stage 2	444	457	-	592	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	188	221	712	133	224	550	1228	-	-	1029	-	-
Mov Cap-2 Maneuver	188	221	-	133	224	-	-	-	-	-	-	-
Stage 1	629	622	-	430	438	-	-	-	-	-	-	-
Stage 2	392	433	-	436	622	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.2		24		0.9		0.3	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1228	-	-	584	249	1029	-	-
HCM Lane V/C Ratio	0.052	-	-	0.332	0.243	0.012	-	-
HCM Control Delay (s)	8.1	-	-	14.2	24	8.5	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.4	0.9	0	-	-

Timings
7: Towner Ave & Briargate Pkwy/Stapleton Dr

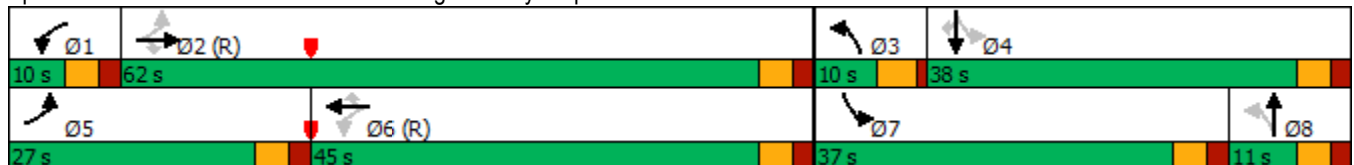
2040 Background Traffic
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations												
Traffic Volume (vph)	228	840	15	5	1140	430	50	23	371	16	318	
Future Volume (vph)	228	840	15	5	1140	430	50	23	371	16	318	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	
Protected Phases	5	2		1	6		3	8	7	4		
Permitted Phases	2		2	6		6	8		4		4	
Detector Phase	5	2	2	1	6	6	3	8	7	4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	9.5	10.0	10.0	10.0	10.0	
Total Split (s)	27.0	62.0	62.0	10.0	45.0	45.0	10.0	11.0	37.0	38.0	38.0	
Total Split (%)	22.5%	51.7%	51.7%	8.3%	37.5%	37.5%	8.3%	9.2%	30.8%	31.7%	31.7%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	73.8	71.8	71.8	58.4	53.2	53.2	9.4	5.9	36.2	28.2	28.2	
Actuated g/C Ratio	0.62	0.60	0.60	0.49	0.44	0.44	0.08	0.05	0.30	0.24	0.24	
v/c Ratio	0.81	0.42	0.02	0.01	0.77	0.72	0.37	0.37	0.82	0.04	0.54	
Control Delay	48.6	15.6	0.0	13.8	35.4	14.3	40.6	51.8	51.0	32.9	7.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.6	15.6	0.0	13.8	35.4	14.3	40.6	51.8	51.0	32.9	7.0	
LOS	D	B	A	B	D	B	D	D	D	C	A	
Approach Delay		22.3			27.6			45.1		30.8		
Approach LOS		C			C			D		C		

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 27.1
 Intersection LOS: C
 Intersection Capacity Utilization 83.9%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 7: Towner Ave & Briargate Pkwy/Stapleton Dr



Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	36	0	5	21	7	0	0	16	22	0	1
Future Vol, veh/h	0	36	0	5	21	7	0	0	16	22	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	39	0	5	23	8	0	0	17	24	0	1

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	31	0	0	39	0	0	77	80	39	85	76	27
Stage 1	-	-	-	-	-	-	39	39	-	37	37	-
Stage 2	-	-	-	-	-	-	38	41	-	48	39	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1582	-	-	1571	-	-	912	810	1033	901	814	1048
Stage 1	-	-	-	-	-	-	976	862	-	978	864	-
Stage 2	-	-	-	-	-	-	977	861	-	965	862	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1582	-	-	1571	-	-	909	808	1033	884	812	1048
Mov Cap-2 Maneuver	-	-	-	-	-	-	909	808	-	884	812	-
Stage 1	-	-	-	-	-	-	976	862	-	978	861	-
Stage 2	-	-	-	-	-	-	973	858	-	949	862	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.1	8.5	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1033	1582	-	-	1571	-	-	890
HCM Lane V/C Ratio	0.017	-	-	-	0.003	-	-	0.028
HCM Control Delay (s)	8.5	0	-	-	7.3	0	-	9.2
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	0	14	6	0	5	4	17	2	2	13	8
Future Vol, veh/h	14	0	14	6	0	5	4	17	2	2	13	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	0	15	7	0	5	4	18	2	2	14	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	53	51	19	57	54	19	23	0	0	20	0	0
Stage 1	23	23	-	27	27	-	-	-	-	-	-	-
Stage 2	30	28	-	30	27	-	-	-	-	-	-	-
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	946	840	1059	940	837	1059	1592	-	-	1596	-	-
Stage 1	995	876	-	990	873	-	-	-	-	-	-	-
Stage 2	987	872	-	987	873	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	938	837	1059	924	834	1059	1592	-	-	1596	-	-
Mov Cap-2 Maneuver	938	837	-	924	834	-	-	-	-	-	-	-
Stage 1	992	875	-	987	870	-	-	-	-	-	-	-
Stage 2	979	869	-	972	872	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	8.7	1.3	0.6
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1592	-	-	995	981	1596	-	-
HCM Lane V/C Ratio	0.003	-	-	0.031	0.012	0.001	-	-
HCM Control Delay (s)	7.3	0	-	8.7	8.7	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection						
Int Delay, s/veh	6.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	70	34	126	108	56	172
Future Vol, veh/h	70	34	126	108	56	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	88	88	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	42	143	123	78	239

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	128	0	516 107
Stage 1	-	-	-	-	107 -
Stage 2	-	-	-	-	409 -
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	-	-	1458	-	519 947
Stage 1	-	-	-	-	917 -
Stage 2	-	-	-	-	671 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1458	-	468 947
Mov Cap-2 Maneuver	-	-	-	-	468 -
Stage 1	-	-	-	-	827 -
Stage 2	-	-	-	-	671 -

Approach	EB	WB	NB
HCM Control Delay, s	0	4.2	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	468	947	-	-	1458	-
HCM Lane V/C Ratio	0.166	0.252	-	-	0.098	-
HCM Control Delay (s)	14.2	10.1	-	-	7.7	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	1	-	-	0.3	-

HCM 6th TWSC
 6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

2040 Background Traffic
 PM Peak Hour

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	3	8	71	27	4	7	131	298	36	5	227	7
Future Vol, veh/h	3	8	71	27	4	7	131	298	36	5	227	7
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	9	76	29	4	7	139	317	38	5	241	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	875	888	245	911	872	336	248	0	0	355	0	0
Stage 1	255	255	-	614	614	-	-	-	-	-	-	-
Stage 2	620	633	-	297	258	-	-	-	-	-	-	-
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	270	283	794	255	289	706	1318	-	-	1204	-	-
Stage 1	749	696	-	479	483	-	-	-	-	-	-	-
Stage 2	476	473	-	712	694	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	242	252	794	206	257	706	1318	-	-	1204	-	-
Mov Cap-2 Maneuver	242	252	-	206	257	-	-	-	-	-	-	-
Stage 1	670	693	-	429	432	-	-	-	-	-	-	-
Stage 2	417	423	-	634	691	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.8		22.7		2.3		0.2	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1318	-	-	614	243	1204	-	-
HCM Lane V/C Ratio	0.106	-	-	0.142	0.166	0.004	-	-
HCM Control Delay (s)	8.1	-	-	11.8	22.7	8	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	0.6	0	-	-

Timings
7: Towner Ave & Briargate Pkwy/Stapleton Dr

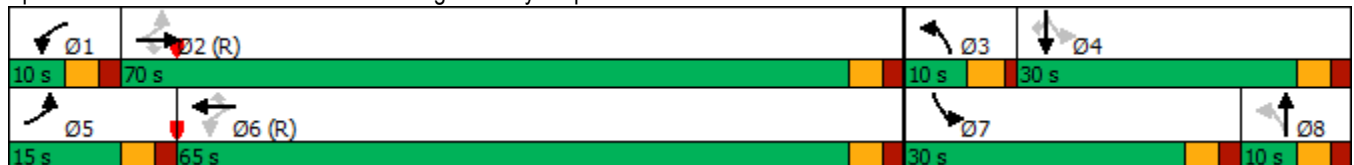
2040 Background Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	323	1312	50	29	592	327	25	7	254	5	218
Future Volume (vph)	323	1312	50	29	592	327	25	7	254	5	218
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	7	4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	9.5	10.0	10.0	10.0	10.0
Total Split (s)	15.0	70.0	70.0	10.0	65.0	65.0	10.0	10.0	30.0	30.0	30.0
Total Split (%)	12.5%	58.3%	58.3%	8.3%	54.2%	54.2%	8.3%	8.3%	25.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	81.7	75.7	75.7	71.9	66.6	66.6	9.0	5.4	28.3	22.3	22.3
Actuated g/C Ratio	0.68	0.63	0.63	0.60	0.56	0.56	0.08	0.04	0.24	0.19	0.19
v/c Ratio	0.65	0.63	0.05	0.15	0.32	0.34	0.20	0.31	0.73	0.01	0.48
Control Delay	16.3	17.6	0.1	10.2	16.2	2.6	38.2	35.2	51.9	38.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	17.6	0.1	10.2	16.2	2.6	38.2	35.2	51.9	38.0	8.7
LOS	B	B	A	B	B	A	D	D	D	D	A
Approach Delay		16.9			11.4			36.7		32.0	
Approach LOS		B			B			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 17.8
 Intersection LOS: B
 Intersection Capacity Utilization 73.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 7: Towner Ave & Briargate Pkwy/Stapleton Dr



Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	7	0	17	21	24	0	0	10	14	0	1
Future Vol, veh/h	2	7	0	17	21	24	0	0	10	14	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	8	0	18	23	26	0	0	11	15	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	49	0	0	8	0	0	85	97	8	90	84	36
Stage 1	-	-	-	-	-	-	12	12	-	72	72	-
Stage 2	-	-	-	-	-	-	73	85	-	18	12	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1558	-	-	1612	-	-	901	793	1074	895	806	1037
Stage 1	-	-	-	-	-	-	1009	886	-	938	835	-
Stage 2	-	-	-	-	-	-	937	824	-	1001	886	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1558	-	-	1612	-	-	891	783	1074	877	796	1037
Mov Cap-2 Maneuver	-	-	-	-	-	-	891	783	-	877	796	-
Stage 1	-	-	-	-	-	-	1008	885	-	937	825	-
Stage 2	-	-	-	-	-	-	925	814	-	990	885	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	2	8.4	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1074	1558	-	-	1612	-	-	886
HCM Lane V/C Ratio	0.01	0.001	-	-	0.011	-	-	0.018
HCM Control Delay (s)	8.4	7.3	0	-	7.3	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	0	9	4	0	3	14	2	7	6	9	8
Future Vol, veh/h	3	0	9	4	0	3	14	2	7	6	9	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	10	4	0	3	15	2	8	7	10	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	67	69	15	70	69	6	19	0	0	10	0	0
Stage 1	29	29	-	36	36	-	-	-	-	-	-	-
Stage 2	38	40	-	34	33	-	-	-	-	-	-	-
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	926	822	1065	922	822	1077	1597	-	-	1610	-	-
Stage 1	988	871	-	980	865	-	-	-	-	-	-	-
Stage 2	977	862	-	982	868	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	914	811	1065	904	811	1077	1597	-	-	1610	-	-
Mov Cap-2 Maneuver	914	811	-	904	811	-	-	-	-	-	-	-
Stage 1	979	868	-	971	857	-	-	-	-	-	-	-
Stage 2	965	854	-	969	865	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	8.7	4.4	1.9
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1597	-	-	1023	971	1610	-	-
HCM Lane V/C Ratio	0.01	-	-	0.013	0.008	0.004	-	-
HCM Control Delay (s)	7.3	0	-	8.6	8.7	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection						
Int Delay, s/veh	11.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	↷
Traffic Vol, veh/h	195	71	288	95	31	260
Future Vol, veh/h	195	71	288	95	31	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	51	77	92	92	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	212	139	374	103	34	542

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	351	0	1133	282
Stage 1	-	-	-	-	282	-
Stage 2	-	-	-	-	851	-
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	-	-	1208	-	224	757
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	419	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1208	-	155	757
Mov Cap-2 Maneuver	-	-	-	-	155	-
Stage 1	-	-	-	-	529	-
Stage 2	-	-	-	-	419	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	21.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	155	757	-	-	1208	-
HCM Lane V/C Ratio	0.217	0.716	-	-	0.31	-
HCM Control Delay (s)	34.6	20.8	-	-	9.3	-
HCM Lane LOS	D	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	6.1	-	-	1.3	-

HCM 6th TWSC
 6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

2040 Total Traffic
 AM Peak Hour

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Vol, veh/h	9	4	206	10	0	16	63	347	14	12	343	3
Future Vol, veh/h	9	4	206	10	0	16	63	347	14	12	343	3
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	43	43	43	66	66	66	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	5	258	23	0	37	95	526	21	12	343	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1114	1106	345	1227	1097	537	346	0	0	547	0	0
Stage 1	369	369	-	727	727	-	-	-	-	-	-	-
Stage 2	745	737	-	500	370	-	-	-	-	-	-	-
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	185	210	698	155	213	544	1213	-	-	1022	-	-
Stage 1	651	621	-	415	429	-	-	-	-	-	-	-
Stage 2	406	425	-	553	620	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	161	191	698	89	194	544	1213	-	-	1022	-	-
Mov Cap-2 Maneuver	161	191	-	89	194	-	-	-	-	-	-	-
Stage 1	600	614	-	383	396	-	-	-	-	-	-	-
Stage 2	349	392	-	342	613	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.3	34.1	1.2	0.3
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1213	-	-	589	183	1022	-
HCM Lane V/C Ratio	0.079	-	-	0.465	0.33	0.012	-
HCM Control Delay (s)	8.2	-	-	16.3	34.1	8.6	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0.3	-	-	2.5	1.4	0	-

Timings
7: Towner Ave & Briargate Pkwy/Stapleton Dr

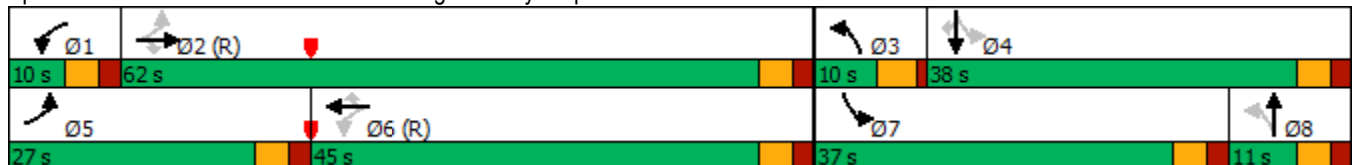
2040 Total Traffic
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	247	840	15	5	1140	436	50	23	390	16	378
Future Volume (vph)	247	840	15	5	1140	436	50	23	390	16	378
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	7	4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	9.5	10.0	10.0	10.0	10.0
Total Split (s)	27.0	62.0	62.0	10.0	45.0	45.0	10.0	11.0	37.0	38.0	38.0
Total Split (%)	22.5%	51.7%	51.7%	8.3%	37.5%	37.5%	8.3%	9.2%	30.8%	31.7%	31.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	73.2	71.2	71.2	56.8	51.6	51.6	9.4	5.9	36.8	28.8	28.8
Actuated g/C Ratio	0.61	0.59	0.59	0.47	0.43	0.43	0.08	0.05	0.31	0.24	0.24
v/c Ratio	0.85	0.43	0.02	0.02	0.80	0.74	0.37	0.37	0.84	0.04	0.62
Control Delay	54.1	15.8	0.0	13.8	37.2	15.1	40.6	51.8	53.1	32.8	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	15.8	0.0	13.8	37.2	15.1	40.6	51.8	53.1	32.8	10.8
LOS	D	B	A	B	D	B	D	D	D	C	B
Approach Delay		24.1			29.0			45.1		32.3	
Approach LOS		C			C			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 28.6
 Intersection LOS: C
 Intersection Capacity Utilization 86.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 7: Towner Ave & Briargate Pkwy/Stapleton Dr



Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	80	0	5	35	13	0	0	16	38	0	10
Future Vol, veh/h	3	80	0	5	35	13	0	0	16	38	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	87	0	5	38	14	0	0	17	41	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	52	0	0	87	0	0	154	155	87	157	148	45
Stage 1	-	-	-	-	-	-	93	93	-	55	55	-
Stage 2	-	-	-	-	-	-	61	62	-	102	93	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1554	-	-	1509	-	-	813	737	971	809	743	1025
Stage 1	-	-	-	-	-	-	914	818	-	957	849	-
Stage 2	-	-	-	-	-	-	950	843	-	904	818	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1554	-	-	1509	-	-	802	733	971	791	739	1025
Mov Cap-2 Maneuver	-	-	-	-	-	-	802	733	-	791	739	-
Stage 1	-	-	-	-	-	-	912	816	-	955	846	-
Stage 2	-	-	-	-	-	-	937	840	-	886	816	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.7			8.8			9.6		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	971	1554	-	-	1509	-	-	830
HCM Lane V/C Ratio	0.018	0.002	-	-	0.004	-	-	0.063
HCM Control Delay (s)	8.8	7.3	0	-	7.4	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	58	0	69	6	0	5	22	20	2	2	21	23
Future Vol, veh/h	58	0	69	6	0	5	22	20	2	2	21	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	0	75	7	0	5	24	22	2	2	23	25

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	114	112	36	148	123	23	48	0	0	24	0	0
Stage 1	40	40	-	71	71	-	-	-	-	-	-	-
Stage 2	74	72	-	77	52	-	-	-	-	-	-	-
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	863	778	1037	820	767	1054	1559	-	-	1591	-	-
Stage 1	975	862	-	939	836	-	-	-	-	-	-	-
Stage 2	935	835	-	932	852	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	847	765	1037	751	754	1054	1559	-	-	1591	-	-
Mov Cap-2 Maneuver	847	765	-	751	754	-	-	-	-	-	-	-
Stage 1	959	861	-	924	823	-	-	-	-	-	-	-
Stage 2	915	822	-	864	851	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.5		9.2		3.7		0.3	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1559	-	-	941	864	1591	-	-
HCM Lane V/C Ratio	0.015	-	-	0.147	0.014	0.001	-	-
HCM Control Delay (s)	7.3	0	-	9.5	9.2	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-	-

Intersection

Int Delay, s/veh 6.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	100	44	126	159	73	172
Future Vol, veh/h	100	44	126	159	73	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	205	-	155	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	88	88	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	123	54	143	181	101	239

Major/Minor

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	177	0	617 150
Stage 1	-	-	-	-	150 -
Stage 2	-	-	-	-	467 -
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	-	-	1399	-	453 896
Stage 1	-	-	-	-	878 -
Stage 2	-	-	-	-	631 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1399	-	407 896
Mov Cap-2 Maneuver	-	-	-	-	407 -
Stage 1	-	-	-	-	788 -
Stage 2	-	-	-	-	631 -

Approach

	EB	WB	NB
HCM Control Delay, s	0	3.5	12.4
HCM LOS			B

Minor Lane/Major Mvmt

	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	407	896	-	-	1399	-
HCM Lane V/C Ratio	0.249	0.267	-	-	0.102	-
HCM Control Delay (s)	16.8	10.5	-	-	7.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1	1.1	-	-	0.3	-

HCM 6th TWSC
 6: Towner Ave & Londonderry Drive/Londonderry Drive (South)

2040 Total Traffic
 PM Peak Hour

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	3	8	113	27	4	7	203	315	36	5	236	7
Future Vol, veh/h	3	8	113	27	4	7	203	315	36	5	236	7
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	-	-	-	-	-	-	290	-	-	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	9	120	29	4	7	216	335	38	5	251	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1057	1070	255	1115	1054	354	258	0	0	373	0	0
Stage 1	265	265	-	786	786	-	-	-	-	-	-	-
Stage 2	792	805	-	329	268	-	-	-	-	-	-	-
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	203	221	784	185	226	690	1307	-	-	1185	-	-
Stage 1	740	689	-	385	403	-	-	-	-	-	-	-
Stage 2	382	395	-	684	687	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	172	184	784	132	188	690	1307	-	-	1185	-	-
Mov Cap-2 Maneuver	172	184	-	132	188	-	-	-	-	-	-	-
Stage 1	618	686	-	321	337	-	-	-	-	-	-	-
Stage 2	311	330	-	570	684	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.6		34.7		3		0.2	
HCM LOS	B		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1307	-	-	605	161	1185	-	-
HCM Lane V/C Ratio	0.165	-	-	0.218	0.251	0.004	-	-
HCM Control Delay (s)	8.3	-	-	12.6	34.7	8.1	-	-
HCM Lane LOS	A	-	-	B	D	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	0.8	0.9	0	-	-

Timings
7: Towner Ave & Briargate Pkwy/Stapleton Dr

2040 Total Traffic
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	391	1312	50	29	592	348	25	7	266	5	258
Future Volume (vph)	391	1312	50	29	592	348	25	7	266	5	258
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	7	4	
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	1	6	6	3	8	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	9.5	10.0	10.0	10.0	10.0
Total Split (s)	15.0	70.0	70.0	10.0	65.0	65.0	10.0	10.0	30.0	30.0	30.0
Total Split (%)	12.5%	58.3%	58.3%	8.3%	54.2%	54.2%	8.3%	8.3%	25.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	81.4	75.4	75.4	70.0	64.8	64.8	8.9	5.3	28.6	22.6	22.6
Actuated g/C Ratio	0.68	0.63	0.63	0.58	0.54	0.54	0.07	0.04	0.24	0.19	0.19
v/c Ratio	0.78	0.63	0.05	0.15	0.33	0.36	0.20	0.31	0.75	0.01	0.53
Control Delay	24.0	17.8	0.1	10.3	16.9	2.7	38.4	35.7	53.0	38.0	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	17.8	0.1	10.3	16.9	2.7	38.4	35.7	53.0	38.0	8.6
LOS	C	B	A	B	B	A	D	D	D	D	A
Approach Delay		18.7			11.6			37.0		31.2	
Approach LOS		B			B			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 18.9
 Intersection LOS: B
 Intersection Capacity Utilization 74.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 7: Towner Ave & Briargate Pkwy/Stapleton Dr



Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	36	0	17	70	44	0	0	10	25	0	7
Future Vol, veh/h	11	36	0	17	70	44	0	0	10	25	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	39	0	18	76	48	0	0	11	27	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	124	0	0	39	0	0	203	223	39	205	199	100
Stage 1	-	-	-	-	-	-	63	63	-	136	136	-
Stage 2	-	-	-	-	-	-	140	160	-	69	63	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1463	-	-	1571	-	-	755	676	1033	753	697	956
Stage 1	-	-	-	-	-	-	948	842	-	867	784	-
Stage 2	-	-	-	-	-	-	863	766	-	941	842	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1463	-	-	1571	-	-	738	662	1033	733	683	956
Mov Cap-2 Maneuver	-	-	-	-	-	-	738	662	-	733	683	-
Stage 1	-	-	-	-	-	-	940	835	-	860	775	-
Stage 2	-	-	-	-	-	-	846	757	-	924	835	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.8			0.9			8.5			9.9		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1033	1463	-	-	1571	-	-	772
HCM Lane V/C Ratio	0.011	0.008	-	-	0.012	-	-	0.045
HCM Control Delay (s)	8.5	7.5	0	-	7.3	0	-	9.9
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	32	0	45	4	0	3	77	12	7	6	14	57
Future Vol, veh/h	32	0	45	4	0	3	77	12	7	6	14	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	0	49	4	0	3	84	13	8	7	15	62

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	247	249	46	270	276	17	77	0	0	21	0	0
Stage 1	60	60	-	185	185	-	-	-	-	-	-	-
Stage 2	187	189	-	85	91	-	-	-	-	-	-	-
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	707	654	1023	683	632	1062	1522	-	-	1595	-	-
Stage 1	951	845	-	817	747	-	-	-	-	-	-	-
Stage 2	815	744	-	923	820	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	672	614	1023	620	593	1062	1522	-	-	1595	-	-
Mov Cap-2 Maneuver	672	614	-	620	593	-	-	-	-	-	-	-
Stage 1	898	841	-	771	705	-	-	-	-	-	-	-
Stage 2	767	702	-	874	816	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.8		9.8		6		0.6	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1522	-	-	841	755	1595	-	-
HCM Lane V/C Ratio	0.055	-	-	0.1	0.01	0.004	-	-
HCM Control Delay (s)	7.5	0	-	9.8	9.8	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0	0	-	-



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April 8, 2004

Mr. Harold Fong
Manager, Falcon Hills
Six Ninety Nine LA, LLC
545 East Pikes Peak, Suite 207
Colorado Springs, CO 80903

RE: Falcon Hills
Updated March 2004
LSC #036080

Dear Mr. Fong:

In response to your request, we have prepared this updated traffic impact analysis report for Falcon Hills. A previous traffic study was prepared for Falcon Hills entitled *Traffic Impact Report For Falcon Hills* dated May 3, 2000 by URS Corporation. Falcon Hills is located west of Meridian Road and north of Stapleton Road in El Paso County, Colorado. The site location and vicinity are shown in Figure 1. The purpose of this report is to present an updated study based on the current land use plan, including the specific separate traffic impacts for each of the various landowners within Falcon Hills as well as for the area as a whole, and to identify the short- and long-term transportation system improvements adjacent to Falcon Hills.

This report contains an analysis of the traffic estimated to be generated by each of the existing and future proposed development parcels within Falcon Hills, estimates of the projected site-generated traffic volumes on the existing and future adjacent roadway system, and the impacts of additional traffic on the area roadways and intersections by ownership land use type. The report also identifies recommendations for auxiliary turn lanes, traffic signals, and other roadway system improvements for the short and long term.

LAND USE PLAN AND OWNERSHIP

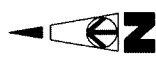
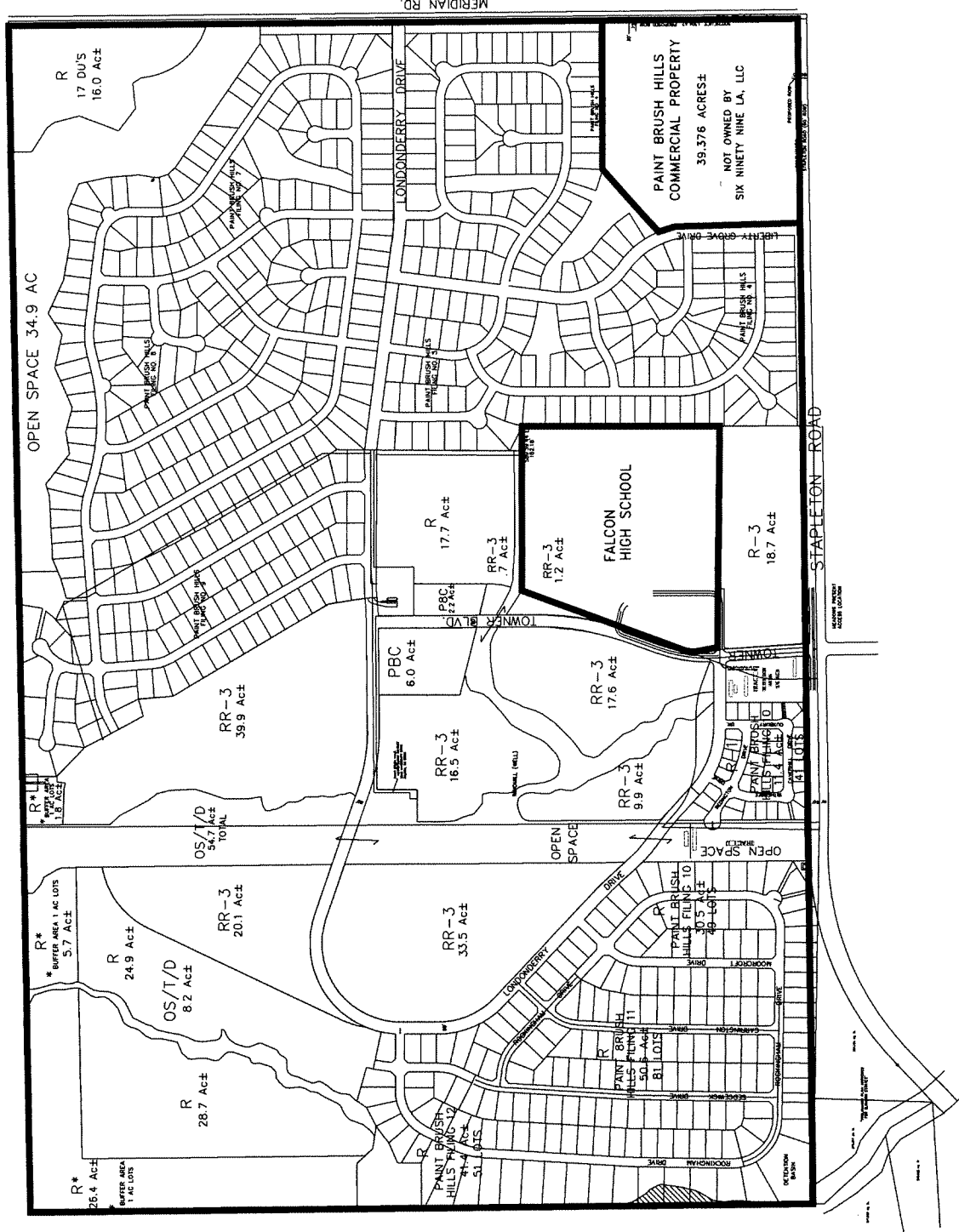
Falcon Hills is located west of Meridian Road and north of Stapleton Road. Aside from existing developed individual lots, of which there were about 497 in August 2003, there are three major owners of developing and undeveloped land within Falcon Hills. These owners are **Six Ninety Nine LA, LLC; School District 49; and Roger Barrack/Scott Smith**. These three owners will each contribute to a portion of the total traffic impacts of future development within Falcon Hills. Thus, the idea is that each would contribute to an equitable portion of the total cost of street improvements necessitated by the traffic generated.

Table 1
Trip Generation Estimate
Falcon Hills Update

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾					Total Trips Generated					Percent Internal Trips	Total External Trips Generated					New Trips Generated	
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Percent Pass-by Trips ⁽²⁾	Average New Weekday Traffic
				In	Out	In	Out		In	Out	In	Out			In	Out	In	Out		
SCENARIO 1																				
Six Ninety Nine LA, LLC Land Uses																				
Residential Uses																				
210	Single-Family Detached Housing	1290 DU ⁽³⁾	9.57	0.19	0.56	0.65	0.36	12,345	242	726	834	469	10%	11,111	218	653	750	422	0%	11,111
220	Apartment	180 DU	6.74	0.08	0.43	0.43	0.21	1,213	15	78	78	38	10%	1,092	13	70	70	34	0%	1,092
			Total Six Ninety Nine Residential					13,558	257	803	912	507		12,203	231	723	820	457		12,203
Neighborhood Commercial Uses																				
820	Shopping Center	82 KSF ⁽⁴⁾	73.17	1.06	0.68	3.22	3.49	6,000	87	55	264	286	6%	5,640	81	52	249	269	34%	3,722
			Total Six Ninety Nine Properties					19,558	343	859	1,176	794		17,843	312	775	1,069	726		15,925
School District 49 Land Uses																				
530	High School	706 Students	1.79	0.32	0.14	0.06	0.09	1,264	227	97	42	64	25%	948	170	73	32	48	0%	948
Southeast Corner Land Uses (Not Owned By Six Ninety Nine LA, LLC)																				
820	Shopping Center	360 KSF	43.15	0.58	0.37	1.95	2.11	15,534	209	134	702	760	6%	14,602	197	126	660	715	34%	9,637
			TOTAL SCENARIO 1					36,356	780	1,090	1,920	1,618		33,392	679	974	1,761	1,488		26,510
SCENARIO 2																				
Six Ninety Nine LA, LLC																				
Residential Uses																				
210	Single-Family Detached Housing	1260 DU	9.57	0.19	0.56	0.65	0.36	12,058	236	709	814	458	13%	10,491	206	617	709	399	0%	10,491
220	Apartment	180 DU	6.74	0.08	0.43	0.43	0.21	1,213	15	78	78	38	13%	1,055	13	68	68	33	0%	1,055
			Total Six Ninety Nine Residential					13,271	251	787	892	496		11,546	218	684	776	432		11,546
Neighborhood Commercial Uses																				
820	Shopping Center	82 KSF	73.17	1.06	0.68	3.22	3.49	6,000	87	55	264	286	6%	5,640	81	52	249	269	34%	3,722
			Total Six Ninety Nine Properties					19,271	338	842	1,157	783		17,186	300	736	1,025	701		15,268
School District 49 Land Uses																				
530	High School	706 Students	1.79	0.32	0.14	0.06	0.09	1,264	227	97	42	64	25%	948	170	73	32	48	0%	948
520	Elementary School	500 Students	1.02	0.17	0.12	0.00	0.01	510	86	59	1	5	67%	168	28	20	0	2	0%	168
			Total School District 49					1774	313	157	43	69		1116	199	93	32	49		1116
Southeast Corner Land Uses (Not Owned By Six Ninety Nine LA, LLC)																				
820	Shopping Center	360 KSF	43.15	0.58	0.37	1.95	2.11	15,534	209	134	702	760	6%	14,602	197	126	660	715	34%	9,637
			TOTAL SCENARIO 2					36,579	860	1,133	1,901	1,612		32,904	695	955	1,717	1,465		26,022

Notes:

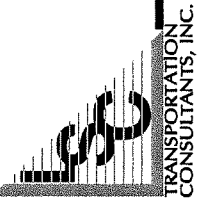
- (1) Source: "Trip Generation," Institute of Transportation Engineers, 6th ed., 1997.
- (2) Source: "Trip Generation Handbook An ITE Recommended Practice" Institute of Transportation Engineers, October 1998.
- (3) DU = dwelling unit
- (4) KSF = thousand square feet of floor area



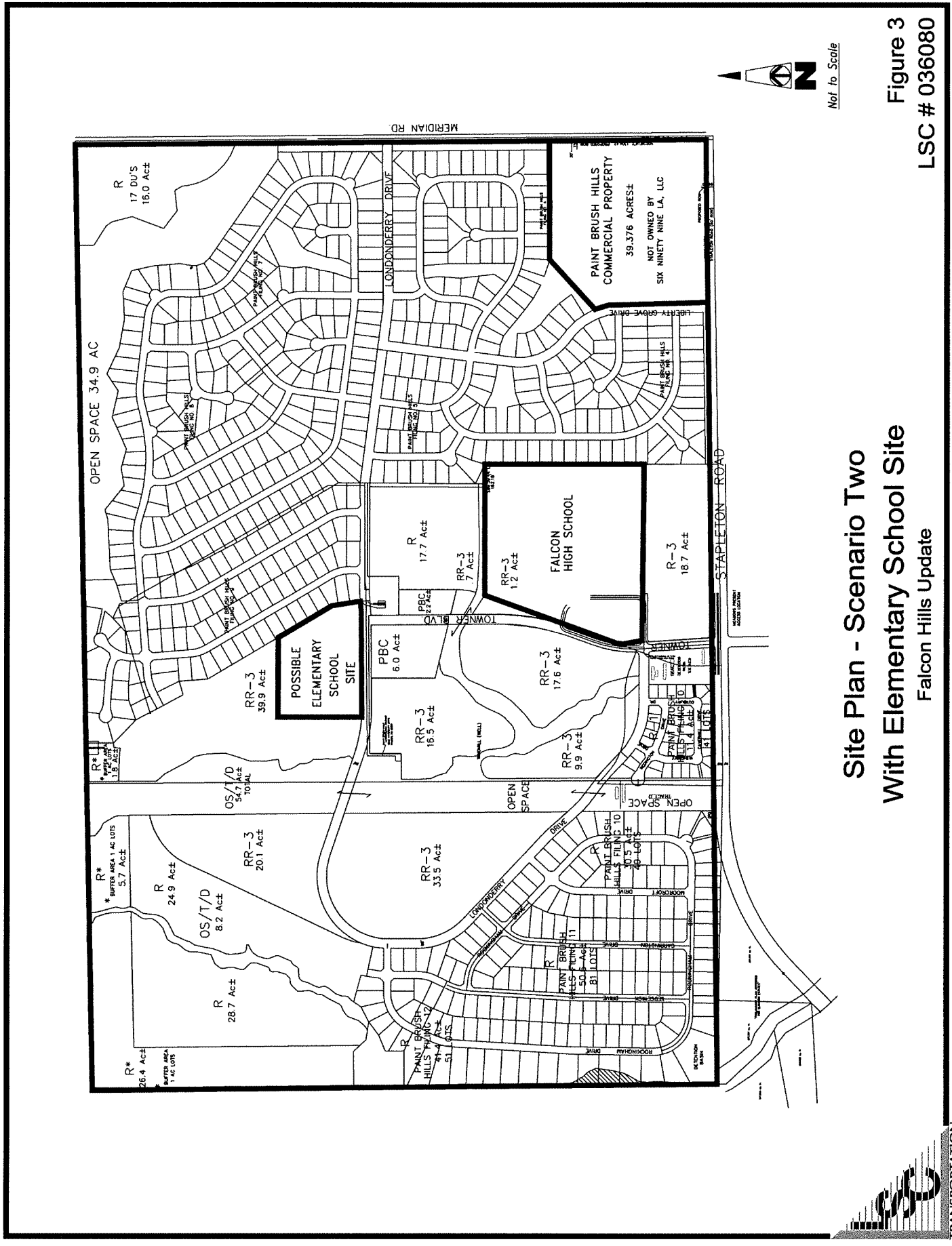
Not to Scale

Site Plan - Scenario One
Without Elementary School Site
 Falcon Hills Update

Figure 2
 LSC # 036080



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Not to Scale

**Site Plan - Scenario Two
With Elementary School Site
Falcon Hills Update**

**Figure 3
LSC # 036080**

