North Armory Redevelopment Project

TRAFFIC IMPACT STUDY

City of Boulder

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TABLE OF CONTENTS

1.0 INTRODUCTION 4

2.0 PROJECT DESCRIPTION 4

3.0 EXISTING CONDTIONS 5

3.1 Roadways 5

3.2 Intersections 6

3.3 Existing Traffic Volumes 7

3.4 Pedestrian and Bicycle 7

3.5 Transit 8

3.6 Existing Intersection Capacity Analysis 8

4.0 FUTURE BACKGROUND TRAFFIC CONDITIONS 9

4.1 Annual Growth Factor and Future Volume Methodology 9

4.2 Year 2018 Background Intersection Capacity Analysis 9

4.3 Year 2035 Background Intersection Capacity Analysis 10

5.0 PROPOSED DEVELOPMENT TRAFFIC 10

5.1 Trip Generation 10

5.2 Trip Distribution and Assignment 11

6.0 FUTURE TRAFFIC CONDITIONS WITH SITE DEVELOPMENT 12

6.1 Year 2018 Background + Project Intersection Capacity Analysis 12

6.2 Year 2035 Background + Project Intersection Capacity Analysis 15

7.0 DAILY VOLUMES AND INTERNAL ROADWAYS/ACCESS 16

7.1 Internal Roadways/Access 17

8.0 CONCLUSIONS 17

LIST OF TABLES

Table 1 – Intersection Level of Service Summary 18-20

Table 2 – Trip Generation Summary.....21

Table 3 - Daily Volume Comparison 16

LIST OF FIGURES

Figure 1 – Vicinity Map 22

Figure 2 – Site and Access Plan.....23

Figure 3 – 2016 Existing Traffic Volumes 24

Figure 4 – Year 2018 Background Traffic Volumes 25

Figure 5 – Year 2035 Background Traffic Volumes 26

Figure 6 – Trip Distribution.....27

Figure 7 – Site-Generated Traffic Volumes 28

Figure 8 – Year 2018 Background + Site-Generated Traffic Volumes.....29

Figure 9 – Year 2035 Background + Site-Generated Traffic Volumes.....30

APPENDIX

Level of Service Definitions

Existing Traffic Data

Intersection Capacity Worksheets

Transportation Demand Management Plan

Traffic Assessment Memo

NORTH BOULDER ARMORY REDEVELOPMENT

TRAFFIC IMPACT STUDY

1.0 INTRODUCTION

This traffic impact study has been prepared by the Fox Tuttle Hernandez Transportation Group for the redevelopment of the North Boulder Armory site in the City of Boulder. The North Boulder Armory is located is located in the southeast corner of Broadway and Lee Hill Drive in north Boulder. The project proposes to redevelop a the 8.5 ± acre property with residential and retail/restaurant uses.

The purpose of this study is to assist in identifying potential traffic impacts within the study area as a result of this development project. The traffic study addresses existing, short-term (Year 2018), and long-term (Year 2035) peak hour intersection conditions (weekday AM and PM) in the study area without and with the project generated traffic. The information contained in this study is anticipated to be used by the City in identifying any intersection or roadway deficiencies and potential improvements for both the near term and long term future scenarios.

2.0 PROJECT DESCRIPTION

The North Boulder Armory 8.5 ± acre site is includes two zoning designations: MU-1 (6.5-acres) and RMX-2 (2-acres). Land uses permitted by zoning and proposed by the project include multi-family attached (MFA) dwelling units (DU), townhomes, residential amenities and retail/restaurant uses. The project site is subdivided into four “blocks”, with the following land uses proposed per block:

- Block #1 (MU-1) – 70 MFA DUs (rental – studio to 2-bedroom), 5,600 SF retail/restaurant, 9,496 SF redevelopment of the existing Armory building for residential amenities and leasing office

- Block #2 (MU-1) – 41 MFA DUs (rental – studio to 2-bedroom), 2,800 SF retail/restaurant

- Block #3 (MU-1 and RMX-2) – 25 MFA DUs (rental – studio to 2-bedroom), 8 townhome units (for-sale)
- Block #4 (MU-1 and RMX-2) – 46 MFA DUs (rental – 1-bedroom to 2-bedroom), 10 townhome units (for-sale)

The project represents a total of 200 DUs and 8,400 SF retail/restaurant use. The site will access the existing roadways as listed: one access on Broadway, one on Lee Hill Drive, one on Yellow Pine Avenue, and one on 14th Street. There will be five internal intersections created with the proposed extension of 13th Street and Zamia Avenue. All accesses and internal intersections are anticipated to be full-movement, side-street stop-controlled. There is adequate circulation opportunities for pedestrians and bicyclists throughout the site and connection to the existing facilities.

A vicinity map is shown on **Figure 1**. The site and access plan is provided on **Figure 2**.

3.0 EXISTING CONDTIONS

3.1 Roadways

The study area boundaries took into consideration the amount of traffic to be generated by the project and potential impact to the existing and proposed arterial and collector roadway network.

The existing study area street network consists of arterial, collector and local streets. The primary public roadways that serve the project site are discussed in the following text. The existing study area roadway network is illustrated on **Figure 1**.

> ***US 36*** is a four-lane principal arterial that provides a regional connection between Boulder and Denver, as well as adjacent communities to the north and east of Boulder. Within the study area this roadway is an arterial with limited access; however, through Boulder it becomes an urban six-lane arterial (28th Street) with multiple signalized intersections and access driveways. South of the City it becomes a freeway and leads into downtown Denver. US 36 currently services approximately 13,900 vehicles per day (vpd) just north of Broadway (Year 2015). The posted speed limit on US 36 is 55 miles per hour (mph) within the vicinity of the study area.

Broadway is a two-lane principal arterial, with a center turn lane that provides a north-south connection through the study area. It begins at US 36 and travels south through the entire length of Boulder. This roadway serves as access into the heart of Boulder and connecting to many residential communities and retail centers along the way. It is the western border of the project site. The posted speed limit on Broadway is 40 mph north of the auto repair access and 30 mph south this access.

Lee Hill Drive is a two-lane roadway that provides east-west access through the study area. It connects to US 36 and leads into the foothills. This roadway is categorized as a minor arterial east of Broadway and a collector west of Broadway. Lee Hill Drive services approximately 4,000 vpd west of the project site. The posted speed limit on this roadway is 30 mph in the site vicinity. Lee Hill Drive is the northern border of the project site.

14th Street is a two-lane local street that provides north-south access through the study area on the east edge of the project. It serves as access to residential neighborhoods and has on-street parking on both sides. 14th Street services approximately 810 vpd south of Lee Hill Drive. North of Yarmouth, 14th Street services approximately 1,700 vpd. The posted speed limit is 25 mph in the vicinity of the site.

Yellow Pine Avenue is a two-lane east-west local street that provides a secondary connection between Broadway and 14th Street. It serves as access to residential neighborhoods and has on-street parking on both sides. East of Broadway, Yellow Pine Avenue services approximately 1,300 vpd. The posted speed limit on is 25 mph. This roadway is just south of the southern boundary of the project site and will provide access into the redevelopment site.

Yarmouth Avenue is a two-lane minor arterial and travels east-west between Broadway and US 36. It provides access to multiple residential neighborhoods, a small retail center, and the Boulder Journey School. Yarmouth Avenue directly connects to 14th Street providing another southern route for the project site. The posted speed limit on Yarmouth Avenue is 30 mph.

3.2 Intersections

The study area was developed from discussions with City of Boulder staff and includes six existing intersections. They are listed below with the current traffic control:

1. Broadway and Lee Hill Drive (signalized)

2. Broadway and Yellow Pine Avenue (side-street stop-control)
3. Broadway and Yarmouth Avenue (side-street stop-control)
4. Lee Hill Drive and 14th Street (side-street stop-control)
5. Yarmouth Avenue and 14th Street (side-street stop-control)
6. US 36 (28th Street) and Lee Hill Drive (side-street stop-control)

3.3 Existing Traffic Volumes

Weekday AM and PM peak hour turning-movement volumes and daily roadway volumes were collected in November 2014 for this project. The counts at Broadway and Lee Hill Drive were utilized from the most recent City traffic count available. A 0.5% to 1% annual growth rate was applied to bring the counts to 2016 estimates based on an analysis of area average daily count historic data (see Section 4.1 for more detail). Adjustments were also made as necessary to improve the balance between the adjacent study intersections. The existing traffic volumes are illustrated on **Figure 3**. The existing intersection geometry and traffic control are also shown on the traffic volume figure. Count data sheets are provided in the **Appendix**.

3.4 Pedestrian and Bicycle

South of the site there is a trail along Fourmile Canyon Creek that leads into Foothills Community Park, which has additional paved and hiking trails. There are sidewalks on both sides of the street along all roadways within the study area, except on the west side of 14th Street. This stretch will be constructed with the development of the North Boulder Armory. On Broadway at Yarmouth Avenue there are marked crosswalks that have a high volume of pedestrians. There are crosswalks at the intersection of Broadway and Lee Hill Drive as well.

Broadway, Lee Hill Drive, and Yarmouth Avenue have bike lanes on both sides of the street throughout and beyond the project limits. These facilities provide connectivity and access to city and regional facilities.

3.5 Transit

Broadway serves as major transit corridor with the Y, 204 and SKIP routes served directly adjacent to the site. Routes Y and SKIP travel along Broadway with bus stops adjacent to the project site. Route SKIP (Broadway) travels the length of Boulder along Broadway connecting to downtown, University of Colorado, Boulder Transit Center, two park-n-rides, and various community destinations. Route Y is a regional route between Boulder and Lyons. It travels along US 36 from the Lyons park-n-ride and enters Boulder on Broadway, ending at the Boulder Transit Center in downtown. The bus stops for southbound routes on Broadway are at Front Range Drive and just south of Yellow Pine Avenue. The bus stop for northbound routes on Broadway is just north of Yarmouth Avenue. The bus stops for Route 204 on Yarmouth for each direction are located just east of Broadway.

3.6 Existing Intersection Capacity Analysis

In determining the operational characteristics of an intersection, "Levels of Service" (LOS) A through F are applied, with LOS A indicating very good operations and LOS F indicating congested operations. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement. A more detailed discussion of LOS methodology is contained in the **Appendix** for reference. Criteria contained in the *Highway Capacity Manual (HCM)*[1] was applied for these analyses in order to determine existing levels of service during peak hour periods. Updated signal timing information from the City, including changes to study area signal timing (90-second cycle length in the AM and 120-second cycle length in PM) were incorporated into the Synchro analysis.

The results of the LOS calculations for the intersections are summarized in **Table 1**. The intersection level of service worksheets are attached in the **Appendix**. The analyses shows that all study area intersections are operating acceptably overall in both peak periods. All movements operate at LOS D or better in the existing conditions.

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[1] Highway Capacity Manual, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 2010. Synchro v. 8 software utilized.

4.0 FUTURE BACKGROUND TRAFFIC CONDITIONS

4.1 Annual Growth Factor and Future Volume Methodology

In order to forecast the future peak hour traffic volumes, historical traffic volumes were gathered from the City of Boulder Traffic Count Database. Since there is not a count site within the study area the available counts on US 36 north of Broadway and Lee Hill Drive west of 6th Street were utilized. The historical data reflects the following linear regression annual growth rates:

- US 36 North of Broadway = +1.1%
- Lee Hill Road West of 4th Street = -1.2%
- Broadway south of Iris Avenue = +0.6%

Based on discussion with City staff, a 0.5% was utilized for the majority of background traffic growth projections. Given the potential redevelopment opportunities on Lee Hill Drive west of Broadway, a higher rate of 1% annual growth was utilized for the northbound left-turn at Broadway and Lee Hill Drive to ensure the movement will operate acceptably. The 1% growth rate was also applied to northbound and southbound through movements at US 36 & Lee Hill Road.

This growth rate was applied to the existing study area traffic volumes to determine the short-term and long-term volumes. West of the North Boulder Armory site, there is another development referred to as 820 Lee Hill Drive which plans to construct 31 single-family detached homes. The trips estimated for this residential development were gathered from the traffic impact study performed by Fox Tuttle (August 2013) and added to the background volumes in the short-term and long-term scenarios. Using these assumptions, the 2018 background traffic is summarized on **Figure 4** and the 2035 background traffic is summarized on **Figure 5**.

4.2 Year 2018 Background Intersection Capacity Analysis

The study area intersections were evaluated to determine baseline operations for the 2016 background scenario and to identify any capacity constraints associated with background traffic. The level of service criteria discussed previously was applied to the study area intersections to determine the impacts with the short-term background volumes.

The results of the LOS calculations for the intersections are summarized in **Table 1**. The intersection level of service worksheets are attached in the **Appendix**. The data shows that all study area intersections will continue to operate acceptably overall in the short-term background scenario. All intersections and movements continue to be LOS D or better in both peak periods.

4.3 Year 2035 Background Intersection Capacity Analysis

The study area intersections were evaluated to determine baseline operations for the 2035 background scenario and to identify any capacity constraints associated with background traffic. The level of service criteria discussed previously was applied to the study area intersections to determine the impacts with the long-term background volumes.

The results of the LOS calculations for the intersections are summarized in **Table 1**. The intersection level of service worksheets are attached in the **Appendix**. The data shows that all study area intersections will operate acceptably overall in the long-term background scenario. All intersections and movement continue to be LOS D or better in both peak periods, with the exception of the eastbound left-through lane and westbound approach at US 36 & Lee Hill Drive. These are both low-volume (< 10 vph) movements and this level of delay of typical of side-street, stop-controlled approach to a major roadway. This intersection is not approaching minimum signal warrant volumes and the calculated side-street delays with stop-control are similar or shorter to what would be experienced with a traffic signal in place.

5.0 PROPOSED DEVELOPMENT TRAFFIC

5.1 Trip Generation

A trip generation estimate was performed to determine the traffic characteristics of the planned park. The trip rates contained in the I*nstitute of Transportation Engineers (ITE) Trip Generation Manual*[2] for land use #220 “Apartment”, #230 “Residential Condominium/Townhouse”, #710 “General Office” and #932 “High-Turnover (Sit-Down) Restaurant were applied to estimate proposed traffic for the site.

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[2] Trip Generation 9th Edition, Institute of Transportation Engineers, 2012.

The project site is subdivided into four "blocks", with the following land uses proposed per block:

- Block #1– 70 apartment DUs, 5,600 SF retail/restaurant, and redevelopment of the existing Armory building for residential amenities and leasing office
- Block #2 – 41 apartment DUs, 2,800 SF retail/restaurant
- Block #3 - 25 MFA apartment DUs, 8 townhome units
- Block #4 - 46 apartment DUs 10 townhome units (for-sale)

The project represents a total of 182 apartments, 18 townhomes, and 8,400 SF retail/restaurant use. For the retail uses, the ITE rates for "High-Turnover (Sit-Down) Restaurant" were applied as these represent higher, more conservative traffic generation than a standard retail use. The Amory building redevelopment is proposed to be repurposes as an amenity for the residential community, including a leasing and management office, club room, restrooms, a workout room, and other amenities. These uses, with the exception of the leasing office, are not anticipated to generate unique vehicular traffic to the site. The leasing office trips were estimated using ITE rates and equations for "General Office" use.

The most applicable ITE land use types were utilized and the units were multiplied by the ITE trip rates and/or equations to estimate the new site traffic as shown in **Table 2**. The site restaurant uses may experience "Pass-By" trips. These are trips that are already occurring on the adjacent roadways but may divert into the site once developed and are thus not considered "new" trips to the site area. However, to provide a conservative estimate of site traffic impacts, pass-by traffic was not assumed in this analysis.

As shown in **Table 2**, the project is anticipated to generate 1,935 daily, 157 AM peak hour, and 166 PM peak hour trips at buildout and full occupancy.

5.2 Trip Distribution and Assignment

The estimated trip volumes presented in **Table 2** were distributed onto the study area street network based on existing traffic characteristics of the area, existing and future land use, and existing and future traffic patterns in the area. The overall assumed distribution is as follows, as well as presented on **Figure 6**:

- 5 percent to/from north Broadway

- 50 percent to/from south Broadway
- 25 percent to/from south US 36 via Lee Hill Drive
- 5 percent to/from west Lee Hill Drive
- 15 percent to/from east Yarmouth Avenue

Using these distribution assumptions, the projected site traffic was assigned to the study area roadway network for the weekday AM and PM peak hour periods. These site-generated volumes are shown on **Figure 7.**

6.0 FUTURE TRAFFIC CONDITIONS WITH SITE DEVELOPMENT

This section discusses impacts associated with the redevelopment of the North Boulder Armory in the short-term and long-term scenarios.

6.1 Year 2018 Background + Project Intersection Capacity Analysis

The site-generated traffic volumes were added to the 2018 background volumes to analyze potential site impacts in the short-term build-out scenario. The 2016 background + site-generated traffic volumes are illustrated on **Figure 9**. The level of service criteria discussed in prior sections was applied to the study area intersections to determine impacts with the addition of site-build out traffic volumes in the short-term. The results of the LOS calculations for the intersections are summarized in **Table 1**.

The study area intersections operate acceptably overall and on all movements in both peak hours.

The proposed accesses will operate acceptably in both peak hours. The accesses should be constructed with the following lane configuration and traffic control:

- **<u>Broadway and Zamia Avenue:</u>**
    - Side-street stop control (westbound)
    - One entering lane and one exiting lane (full-movement)

- The capacity analysis indicates that turn lanes on Broadway are unnecessary; however, the existing center turn lane can be utilized by southbound left-turning vehicles.

- **Lee Hill Drive and 13th Street:**
  - This access will be off-set from the existing access midway between Broadway and 14th Street to create a four-legged intersection.
  - Side-street stop control (northbound/southbound)
  - One entering lane and one exiting lane (full-movement)
  - The capacity analysis indicates that turn lanes on Lee Hill Drive are unnecessary; however, the existing center turn lane can be utilized by westbound left-turning vehicles.

- **13th Street and Zamia Avenue (North):**
  - Side-street stop control (westbound)
  - One entering and one exiting lane per approach (full-movement)
  - The capacity analysis indicates that turn lanes are unnecessary.

- **13th Street and Zamia Avenue (South):**
  - Side-street stop control (eastbound)
  - One entering and one exiting lane per approach (full-movement)
  - The capacity analysis indicates that turn lanes are unnecessary.

- **Yellow Pine Avenue and 13th Street:**
  - This intersection currently exists and with the redevelopment 13th Street will extend north to Lee Hill Drive.
  - Side-street stop control (northbound/southbound) as currently exists

- One entering and one exiting lane per approach (full-movement) as currently exists
- The capacity analysis indicates that turn lanes are unnecessary.

- **<u>14th Street and Zamia Avenue:</u>**
  - This intersection currently exists and Zamia Avenue will extend west to Broadway with the redevelopment.
  - Side-street stop control (eastbound/westbound)
  - One entering and one exiting lane per approach (full-movement)
  - The capacity analysis indicates that turn lanes are unnecessary.
- **<u>14th Street and Yellow Pine Avenue:</u>**
  - This intersection currently exists and development traffic will travel through this intersection due to access on 14th Street and the extension of 13th Street.
  - Side-street stop control (eastbound) as currently exists
  - One entering and one exiting lane per approach (full-movement) as currently exists
  - The capacity analysis indicates that turn lanes are unnecessary.
- **<u>13th Street and Garage:</u>**
  - One entering lane and exiting lane
  - The capacity analysis indicates that turn lanes are unnecessary.
- **<u>13th Street and Block 2 & Block 4 (West) Access:</u>**
  - Side-street stop control (eastbound/westbound)
  - One entering and one exiting lane per approach (full-movement)

- The capacity analysis indicates that turn lanes are unnecessary.

- **<u>Zamia Avenue and Block 1 Access:</u>**
  - One entering and exiting lane
  - The capacity analysis indicates that turn lanes are unnecessary.

6.2 Year 2035 Background + Project Intersection Capacity Analysis

The projected 2035 background volumes were added to the site generated volumes and are illustrated on **Figure 11**. The level of service criteria discussed in prior sections was applied to the study area intersections to determine impacts with the addition of site traffic in the Year 2035 scenario. The results of the LOS calculations for the intersections are summarized in **Table 1**.

The study area intersections will operate acceptably overall with the addition of project trips. The following movement begins to operate at LOS E with the project trips:

- **<u>US 36 (28th Street) at Lee Hill Drive</u>:** This stop-controlled intersection has LOS E on the eastbound approach (left + through) during both peak hours due to the high volume on US 36 which results in minimal gaps for the side-street traffic to enter the intersection. There is minimal traffic on the eastbound approach with a recorded maximum of 5 vph. This intersection was further analyzed in SimTraffic to understanding if the delay is creating a queue. The analysis indicates that the 95th percentile queue will be 6 feet, which is approximately half of one car.

  Recommendation: No mitigation measures are recommended. High side-street approach delays during both peak hours are typical of unsignalized approaches along a major arterial roadway. The side-street volumes are not approaching traffic signal warrant thresholds.

  Pursuant of section 2.03 (S)(4) of the *City Design and Construction Standards* mitigation measures should be discussed/proposed for the LOS E on any movement. Potential mitigation measures would include signalization. To determine the feasibility of a signal at this intersection, the peak hour volumes were compared to the peak hour warrant (Warrant 3) of Section 4C.01 in the *Manual of Uniform Traffic Control Devices (FHWA, 2009 Edition)*. Since the eastbound right-turn is channelized and has an acceleration lane, it should not be included in the minor street volume; therefore, the minor street

volume is 5. The minimum threshold for the minor street volume to meet the peak hour warrant is 100. The future side street volume at this intersection is only 5% of the necessary volume needed to consider a signal; therefore, a signal is not recommended. It should also be noted that if a signal were installed at this location the side street movement delays may remain at LOS E as they will have to wait for their designated green phase, which could be the same or more delay time. Other mitigation options were not considered. If the delay becomes on acceptable to the drivers, then it is assumed they will change their route.

All of the accesses, internally and externally, will operate at LOS C or better in both peak hours with the proposed lane configuration and traffic control listed in 2018 background + project.

7.0 DAILY VOLUMES AND INTERNAL ROADWAYS/ACCESS

Average daily traffic (ADT) counts were collected at three locations within the study area to determine the change in traffic with the redevelopment of the North Boulder Armory site. Counts were collected on 14th Street just south of Lee Hill Drive, on 14th Street just north of Yarmouth Avenue, and on Yellow Pine Road just east of Broadway. It was estimated that the site generated trips will add 175 vehicles to 14th Street south of Lee Hill Drive, 365 vehicles to 14th Street north of Yarmouth Avenue, and 425 vehicles on Yellow Pine Avenue east of Broadway. **Table 3** summarizes the background and background + project volumes for each horizon year with and without pass-by.

Table 3. Daily Volume Comparison

Location	Existing	Year 2018			Year 2035		
		Background	Project-Added	Total	Background	Project-Added	Total
14th Street south of Lee Hill Drive	810	820	175	995	900	175	1,075
14th Street north of Yarmouth Avenue	1,700	1,715	365	2,080	1,900	365	2,265
Yellow Pine Avenue east of Broadway	1,300	1,315	425	1,740	1,450	425	1,875

7.1 Internal Roadways/Access

Based on the capacity analyses detailed in this report, the internal roadway and intersection network will service the projected long-term buildout traffic volumes effectively. The internal, local-street network is designed as a walkable system servicing all modes of traffic at appropriate traffic speeds. Per discussions with City staff, sight distance analysis was performed for the garage access along 13th Street just north of Zamia given that the garage access does not meet the intersection spacing requirements of the Design and Construction Standards (DCS). The analysis found more than sufficient stopping sight-distance for vehicles on 14th Street and vehicles exiting this garage access to safety operate. At the relatively slow travel speeds and volumes projected through the 13th Street and Zamia Avenue roadway geometry, there are no concerns that the garage access location will lead to safety issues.

8.0 CONCLUSIONS

The North Boulder Armory Redevelopment project proposes to redevelop a the 8.5 ± acre property with residential and retail/restaurant uses. The site will access the existing roadways as listed: one access on Broadway, one on Lee Hill Drive, one on Yellow Pine Avenue, and one on 14th Street. There will be five internal intersections created with the proposed extension of 13th Street and Zamia Avenue. All accesses and internal intersections are anticipated to be full-movement, side-street stop-controlled.

The project is estimated to generate approximately 1,935 daily trips with 157 trips occurring in the AM peak hour and 166 trips occurring in the PM peak hour at build-out. It was determined that the existing roadway and intersection network can serve the site added traffic volumes in the short-term and long-term scenarios with the existing geometry and traffic control. **There are no recommended improvements since all intersections and movements will operate acceptably in both peak hours for the short-term and long-term scenarios.**

It is recommended that pedestrian and bicycle facilities be provided throughout the project site. As shown on the plans, sidewalks should be constructed on both sides of the internal roads and connect to all existing facilities. The project proposes to reconstruct the sidewalks on Broadway and Lee Hill Drive adjacent to the site to provide detached facilities. Additional accommodates are proposed for people that bike and use transit that are listed in the Transportation Demand Management plan (**Appendix**).

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Table 1 - Intersection Level of Service Summary

Intersection and Lanes Groups	Existing				2018 Background				2018 Background + Project				2035 Background				2035 Background + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
STOP SIGN CONTROL																				
Broadway and Yellow Pine Avenue	**0.4**	**A**	**0.4**	**A**	**0.4**	**A**	**0.4**	**A**	**0.7**	**A**	**0.6**	**A**	**0.5**	**A**	**0.5**	**A**	**0.8**	**A**	**0.7**	**A**
Westbound Left+Right	14.6	B	15.5	C	14.3	B	15.8	C	16.2	C	16.8	C	17.5	C	17.6	C	18.4	C	18.6	C
Northbound Through+Right	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Southbound Left	8.4	A	9.6	A	8.3	A	9.7	A	8.4	A	9.9	A	10.2	B	10.2	B	8.5	A	10.3	B
Southbound Through	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Broadway and Yarmouth Avenue	**1.9**	**A**	**2.2**	**A**	**1.8**	**A**	**2.2**	**A**	**2.0**	**A**	**2.4**	**A**	**2.0**	**A**	**2.4**	**A**	**2.3**	**A**	**2.8**	**A**
Westbound Left	15.5	C	17.0	C	15.7	C	17.3	C	16.5	C	18.6	C	17.3	C	19.9	C	19.2	C	21.2	C
Westbound Right	15.5	C	17.0	C	15.7	C	17.3	C	16.5	C	18.6	C	17.3	C	19.9	C	19.2	C	21.2	C
Northbound Through+Right	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Southbound Left	8.3	A	9.8	A	8.3	A	9.9	A	8.4	A	10.2	B	8.3	A	10.6	B	8.6	A	10.7	B
Southbound Through	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Lee Hill Drive and 14th Street	**0.9**	**A**	**1.4**	**A**	**0.9**	**A**	**1.1**	**A**	**1.2**	**A**	**1.6**	**A**	**0.9**	**A**	**1.3**	**A**	**1.3**	**A**	**1.7**	**A**
Eastbound Through+Right	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Westbound Left+Through	0.3	A	0.5	A	0.3	A	0.6	A	0.6	A	0.8	A	0.4	A	0.6	A	0.6	A	0.8	A
Northbound Left+Right	10.7	B	10.8	B	10.7	B	11.6	B	10.8	B	11.0	B	10.9	B	10.7	B	11.2	B	11.4	B
Yarmouth Avenue and 14th Street	**2.0**	**A**	**2.8**	**A**	**2.0**	**A**	**2.8**	**A**	**2.8**	**A**	**3.2**	**A**	**2.2**	**A**	**2.5**	**A**	**2.9**	**A**	**3.5**	**A**
Eastbound Left+Through+Right	0.2	A	0.4	A	0.2	A	0.4	A	0.6	A	0.9	A	0.4	A	0.5	A	0.8	A	0.9	A
Westbound Left+Through+Right	0.2	A	0.7	A	0.2	A	0.7	A	0.2	A	0.7	A	0.0	A	0.7	A	0.0	A	0.7	A
Northbound Left+Through+Right	9.2	A	9.6	A	9.2	A	9.6	A	9.2	A	9.6	A	9.2	A	10.2	B	9.7	A	10.8	B
Southbound Left+Through+Right	10.4	B	12.2	B	10.4	B	12.3	B	10.7	B	12.9	B	10.3	B	12.1	B	11.4	B	13.8	B
US 36 (28th Street) and Lee Hill Drive	**8.7**	**A**	**4.2**	**A**	**8.5**	**A**	**4.2**	**A**	**9.9**	**A**	**4.5**	**A**	**11.6**	**B**	**4.4**	**A**	**15.4**	**C**	**4.7**	**A**
Eastbound Left+Through	26.7	D	12.3	B	26.1	D	12.4	B	29.5	D	12.8	B	35.7	E	14.0	B	47.8	E	14.4	B
Westbound Left+Through+Right	0.0	A	27.5	D	0.0	A	28.3	D	29.5	D	30.9	D	0.0	A	38.7	E	0.0	A	42.8	E
Northbound Left	9.2	A	8.4	A	9.2	A	8.4	A	9.3	A	8.5	A	9.4	A	8.7	A	9.7	A	8.8	A
Northbound Through	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Northbound Right	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Southbound Left	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Southbound Through	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Southbound Right	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Broadway and Zamia Avenue									**0.4**	**A**	**0.3**	**A**					**0.4**	**A**	**0.3**	**A**
Westbound Left+Right									14.6	B	15.1	C					15.8	C	16.6	C
Northbound Through+Right									0.0	A	0.0	A					0.0	A	0.0	A
Southbound Left									8.0	A	9.6	A					8.2	A	10.0	A
Southbound Through									0.0	A	0.0	A					0.0	A	0.0	A
Lee Hill Drive and 13th Street									**0.6**	**A**	**0.5**	**A**					**0.5**	**A**	**0.5**	**A**
Eastbound Left									0.0	A	0.0	A					0.0	A	0.0	A
Eastbound Through+Right									0.0	A	0.0	A					0.0	A	0.0	A
Westbound Left									8.0	A	7.8	A					8.1	A	7.8	A
Westbound Through+Right									0.0	A	0.0	A					0.0	A	0.0	A
Northbound Left+Through+Right									10.0	A	9.7	A					10.2	B	9.9	A
Southbound Left+Through+Right									0.0	A	0.0	A					0.0	A	0.0	A

FOX TUTTLE HERNANDEZ
TRANSPORTATION GROUP

Table 1 - Intersection Level of Service Summary

Intersection and Lanes Groups	Existing				2018 Background				2018 Background + Project				2035 Background				2035 Background + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
13th Street and Zamia Avenue (North)									**0.6**	**A**	**0.7**	**A**					**0.6**	**A**	**0.7**	**A**
Westbound Left+Right									*8.9*	*A*	*8.7*	*A*					*8.9*	*A*	*8.7*	*A*
Northbound Through+Right									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*
Southbound Left+Through									*0.0*	*A*	*0.3*	*A*					*0.0*	*A*	*0.3*	*A*
13th Street and Zamia Avenue (South)									**2.7**	**A**	**4.2**	**A**					**2.7**	**A**	**4.2**	**A**
Eastbound Left+Right									*8.7*	*A*	*8.7*	*A*					*8.7*	*A*	*8.7*	*A*
Northbound Left+Through									*0.7*	*A*	*0.9*	*A*					*0.7*	*A*	*0.9*	*A*
Southbound Through+Right									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*
Yellow Pine Avenue and 13th Street									**5.2**	**A**	**5.4**	**A**					**5.2**	**A**	**5.4**	**A**
Eastbound Left+Through+Right									*1.8*	*A*	*2.8*	*A*					*1.8*	*A*	*2.8*	*A*
Westbound Left+Through+Right									*2.2*	*A*	*2.9*	*A*					*2.2*	*A*	*2.9*	*A*
Northbound Left+Through+Right									*9.0*	*A*	*9.1*	*A*					*9.0*	*A*	*9.1*	*A*
Southbound Left+Through+Right									*8.6*	*A*	*8.6*	*A*					*8.6*	*A*	*8.6*	*A*
14th Street and Block 3 Access									**1.1**	**A**	**0.7**	**A**					**1.1**	**A**	**0.7**	**A**
Eastbound Left+Right									*8.6*	*A*	*8.8*	*A*					*8.6*	*A*	*8.8*	*A*
Northbound Left+Through									*0.4*	*A*	*0.6*	*A*					*0.4*	*A*	*0.6*	*A*
Southbound Through+Right									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*
Zamia Avenue and Block 3 Access									**6.2**	**A**	**5.4**	**A**					**6.2**	**A**	**5.4**	**A**
Eastbound Left+Right									*5.4*	*A*	*6.0*	*A*					*5.4*	*A*	*6.0*	*A*
Northbound Left+Through									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*
Southbound Through+Right									*8.4*	*A*	*8.4*	*A*					*8.4*	*A*	*8.4*	*A*
14th Street and Zamia Avenue									**4.0**	**A**	**4.5**	**A**					**4.0**	**A**	**4.5**	**A**
Eastbound Left+Through+Right									*8.8*	*A*	*9.0*	*A*					*8.8*	*A*	*9.0*	*A*
Westbound Left+Through+Right									*8.8*	*A*	*9.1*	*A*					*8.8*	*A*	*9.1*	*A*
Northbound Left+Through+Right									*0.2*	*A*	*0.3*	*A*					*0.2*	*A*	*0.3*	*A*
Southbound Left+Through+Right									*2.0*	*A*	*3.0*	*A*					*2.0*	*A*	*3.0*	*A*
14th Street and Block 4 Access (#3)									**1.9**	**A**	**1.1**	**A**					**1.9**	**A**	**1.1**	**A**
Eastbound Left+Right									*8.7*	*A*	*8.8*	*A*					*8.7*	*A*	*8.8*	*A*
Northbound Left+Through									*1.0*	*A*	*1.1*	*A*					*1.0*	*A*	*1.1*	*A*
Southbound Through+Right									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*
14th Street and Yellow Pine Avenue									**3.9**	**A**	**4.7**	**A**					**3.5**	**A**	**4.2**	**A**
Eastbound Left+Right									*8.5*	*A*	*8.5*	*A*					*8.5*	*A*	*8.5*	*A*
Northbound Left+Through									*3.6*	*A*	*3.8*	*A*					*3.0*	*A*	*3.4*	*A*
Southbound Through+Right									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*
13th Street and Garage #1 Inbound									**5.5**	**A**	**5.2**	**A**					**5.5**	**A**	**5.2**	**A**
Eastbound Left+Right									*8.5*	*A*	*8.5*	*A*					*8.5*	*A*	*8.5*	*A*
Northbound Left+Through									*4.2*	*A*	*5.9*	*A*					*4.2*	*A*	*5.9*	*A*
Southbound Through+Right									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*
13th Street and Block 2 Access/Block 4 Access (West)									**6.1**	**A**	**5.6**	**A**					**6.1**	**A**	**5.6**	**A**
Eastbound Left+Through+Right									*8.6*	*A*	*8.6*	*A*					*8.6*	*A*	*8.6*	*A*
Westbound Left+Through+Right									*8.9*	*A*	*9.0*	*A*					*8.9*	*A*	*9.0*	*A*
Northbound Left+Through+Right									*4.5*	*A*	*5.5*	*A*					*4.5*	*A*	*5.5*	*A*
Southbound Left+Through+Right									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*

FOX TUTTLE HERNANDEZ
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Table 1 - Intersection Level of Service Summary

Intersection and Lanes Groups	Existing				2018 Background				2018 Background + Project				2035 Background				2035 Background + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Zamia Avenue and Block 1 Access									**1.5**	**A**	**1.2**	**A**					**1.5**	**A**	**1.2**	**A**
Eastbound Through									*1.1*	*A*	*1.0*	*A*					*1.1*	*A*	*1.0*	*A*
Westbound Through									*0.0*	*A*	*0.0*	*A*					*0.0*	*A*	*0.0*	*A*
Southbound Left+Right									*8.6*	*A*	*8.5*	*A*					*8.6*	*A*	*8.5*	*A*
SIGNAL CONTROL																				
Broadway and Lee Hill Drive	**16.9**	**B**	**16.1**	**B**	**17.0**	**B**	**16.4**	**B**	**17.0**	**B**	**16.5**	**B**	**17.0**	**B**	**16.6**	**B**	**17.8**	**B**	**17.1**	**B**
Eastbound Left+Through	*37.4*	*D*	*35.5*	*D*	*36.9*	*D*	*35.3*	*D*	*36.9*	*D*	*35.4*	*D*	*37.4*	*D*	*36.6*	*D*	*36.6*	*D*	*34.2*	*C*
Eastbound Right	*28.0*	*C*	*32.9*	*C*	*27.6*	*C*	*32.6*	*C*	*27.6*	*C*	*32.6*	*C*	*27.9*	*C*	*32.8*	*C*	*27.1*	*C*	*31.2*	*C*
Westbound Left	*30.0*	*C*	*33.5*	*C*	*29.5*	*C*	*33.1*	*C*	*29.5*	*C*	*33.2*	*C*	*30.4*	*C*	*33.4*	*C*	*28.7*	*C*	*31.8*	*C*
Westbound Through+Right	*28.2*	*C*	*43.3*	*D*	*27.7*	*C*	*43.3*	*D*	*27.8*	*C*	*43.5*	*D*	*28.5*	*C*	*43.4*	*D*	*26.7*	*C*	*43.3*	*D*
Northbound Left	*7.0*	*A*	*6.1*	*A*	*7.4*	*A*	*6.4*	*A*	*7.5*	*A*	*6.5*	*A*	*7.7*	*A*	*7.3*	*A*	*10.7*	*B*	*8.7*	*A*
Northbound Through+Right	*5.6*	*A*	*6.6*	*A*	*5.9*	*A*	*6.8*	*A*	*5.9*	*A*	*6.8*	*A*	*5.7*	*A*	*7.3*	*A*	*6.8*	*A*	*8.3*	*A*
Southbound Left	*4.9*	*A*	*5.0*	*A*	*5.1*	*A*	*5.1*	*A*	*5.1*	*A*	*5.2*	*A*	*4.9*	*A*	*5.4*	*A*	*5.8*	*A*	*6.4*	*A*
Southbound Through+Right	*8.2*	*A*	*5.1*	*A*	*8.5*	*A*	*5.3*	*A*	*8.5*	*A*	*5.3*	*A*	*8.4*	*A*	*5.3*	*A*	*10.4*	*B*	*6.2*	*A*

Note: Delay represented in average seconds per vehicle.

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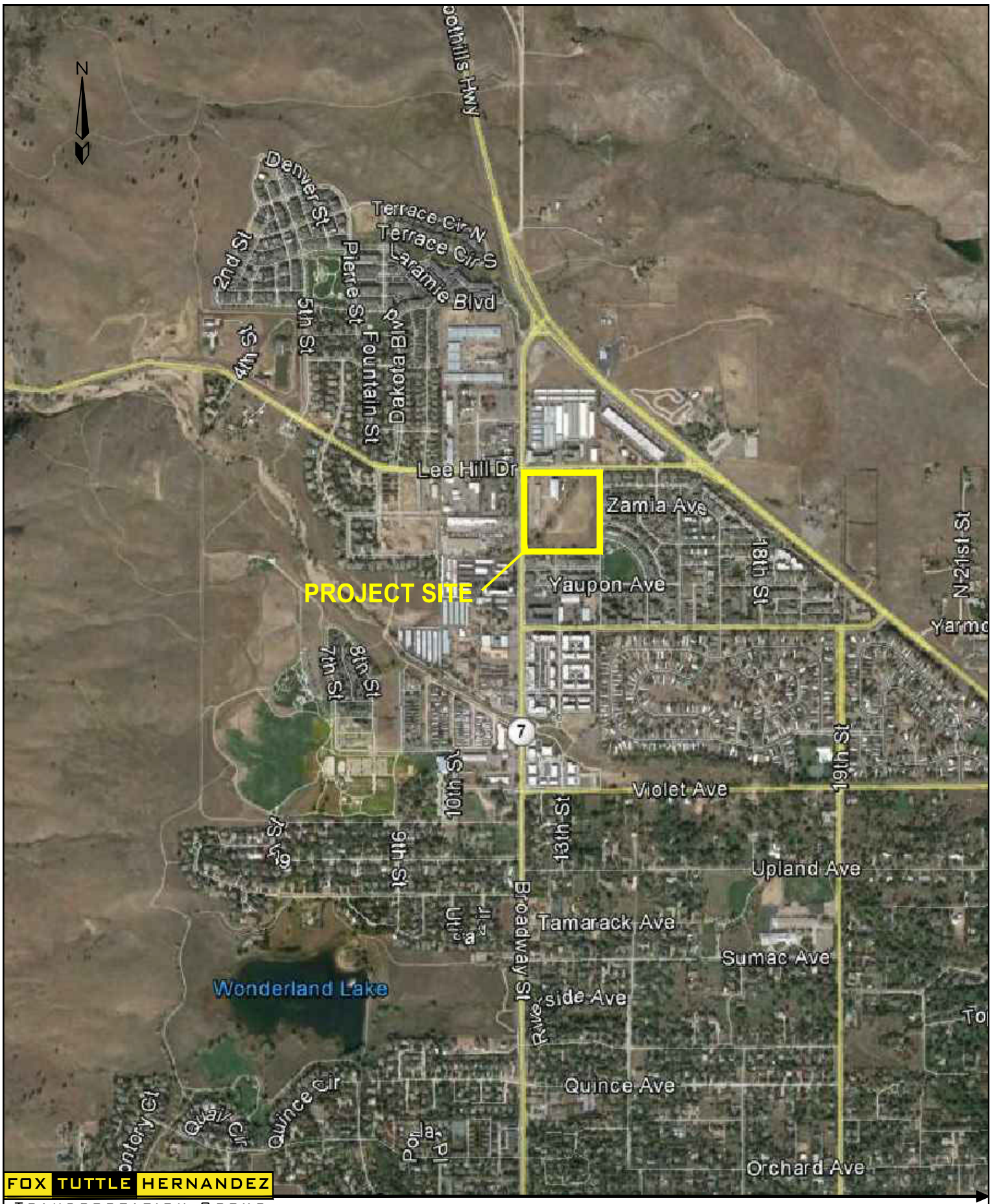
Table 2 - Trip Generation Summary

Land Use	Size	Unit	Average Daily New Trips				AM Peak Hour New Trips				PM Peak Hour New Trips			
			Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
ITE 220 - Apartment	182	Dwelling Units	6.65	1210	605	605	0.51	93	19	74	0.62	113	73	40
ITE 932 - High-Turnover (Sit-down) Restaurant	8.400	1,000 SF	127.15	1068	534	534	10.81	91	50	41	9.85	83	50	33
ITE 710- General Office [Leasing Office]	0.900	1,000 SF	Used ITE Fitted Equation	37	18	19	Used ITE Fitted Equation	4	4	0	1.74	2	0	2
ITE 230 - Residential Condominium/Townhouse	18	Dwelling Units	5.81	105	52	53	0.44	8	1	7	0.52	9	6	3
		Subtotal		***2419***	***1209***	***1211***		***196***	***74***	***122***		***207***	***129***	***78***
Non-Auto Use Reduction [(1)]		20%		*-484*	*-242*	*-242*		*-39*	*-15*	*-24*		*-41*	*-26*	*-16*
		Subtotal		***1935***	***967***	***969***		***157***	***59***	***98***		***166***	***103***	***62***
Total New Trips (All Blocks)			***Daily >***	***1935***	***967***	***969***	***AM >***	***157***	***59***	***98***	***PM >***	***166***	***103***	***62***

Source: ITE Trip Generation 9th Edition. 2012.

(1) Non-Auto Use Factor applies a trip reduction to account for TDM, transit trips, pedestrian trips, and bicycle trips that will occur that are not respresented in the ITE (traditionally suburban) rates as well as for multi-use trips that will occur between retail uses.



FOX TUTTLE HERNANDEZ
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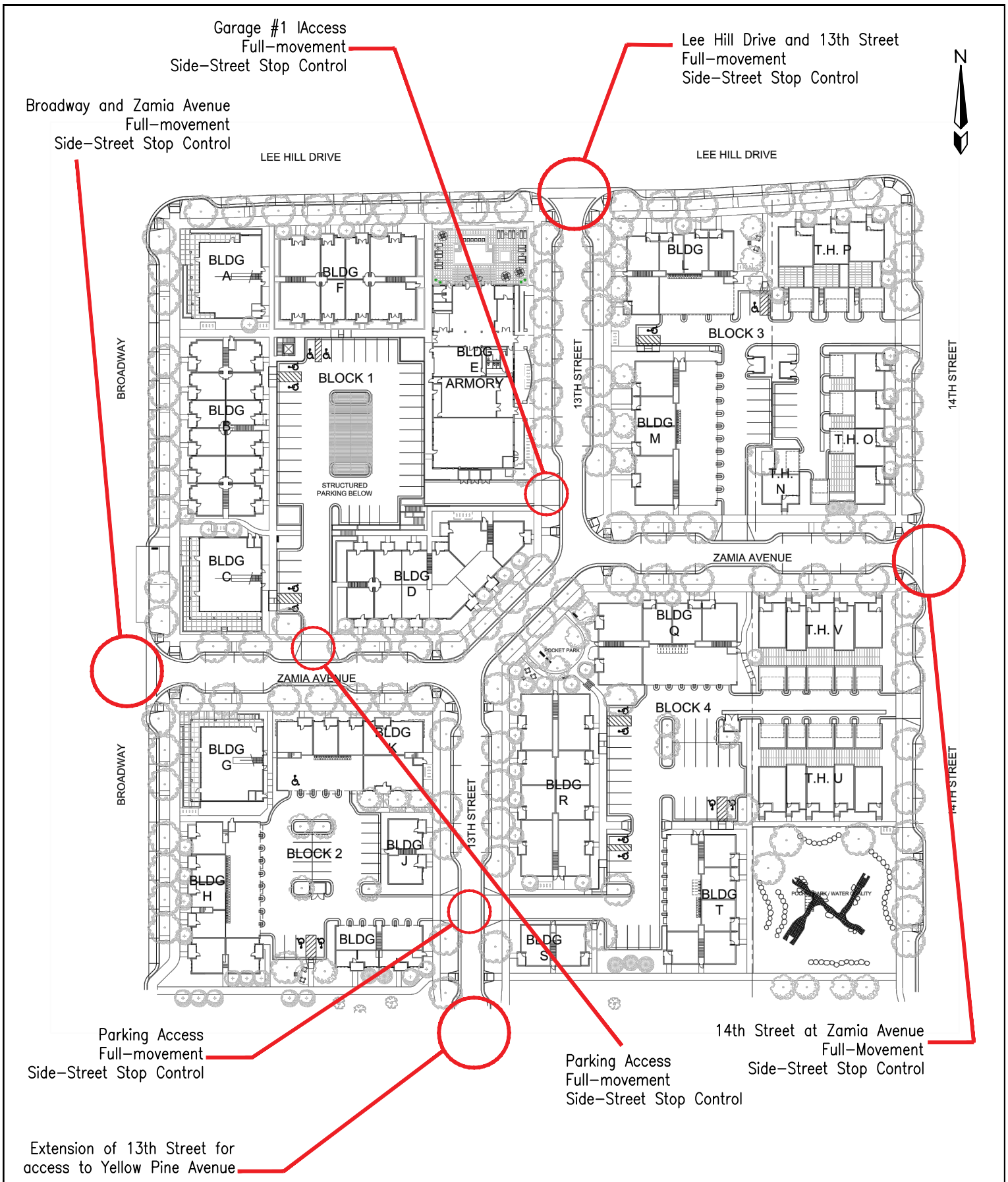
NORTH BOULDER ARMORY REDVELOPMENT

VICINITY MAP

Project #	14023	Original Scale	1"=1,000'	Date	3/18/16	Drawn by	CRS	Figure #	1



FOX TUTTLE HERNANDEZ
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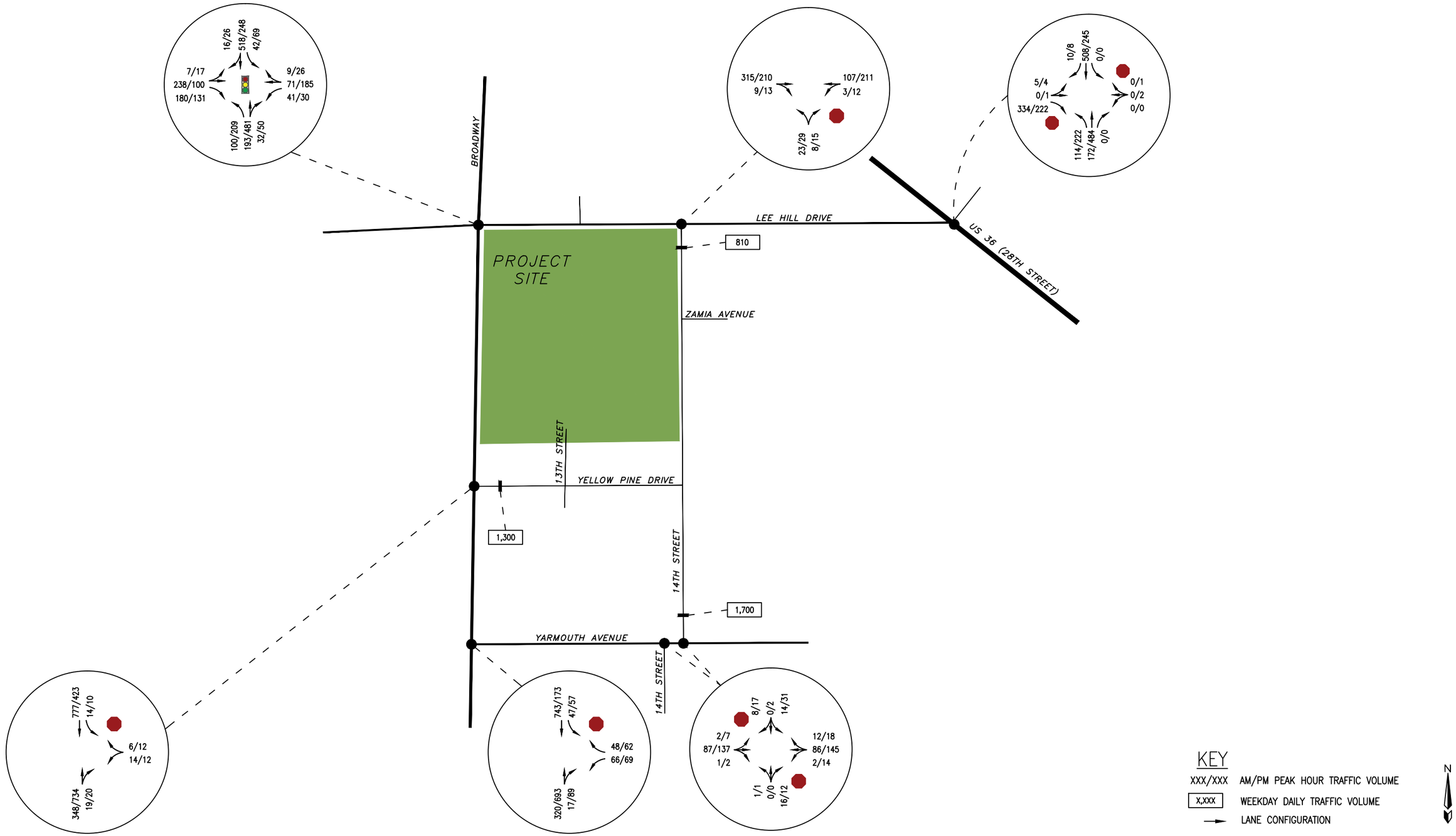
NORTH BOULDER ARMORY REDVELOPMENT

SITE AND ACCESS PLAN

Project #	14023	Original Scale	1"=100'	Date	3/18/16	Drawn by	CRS	Figure #	2



FOX TUTTLE HERNANDEZ
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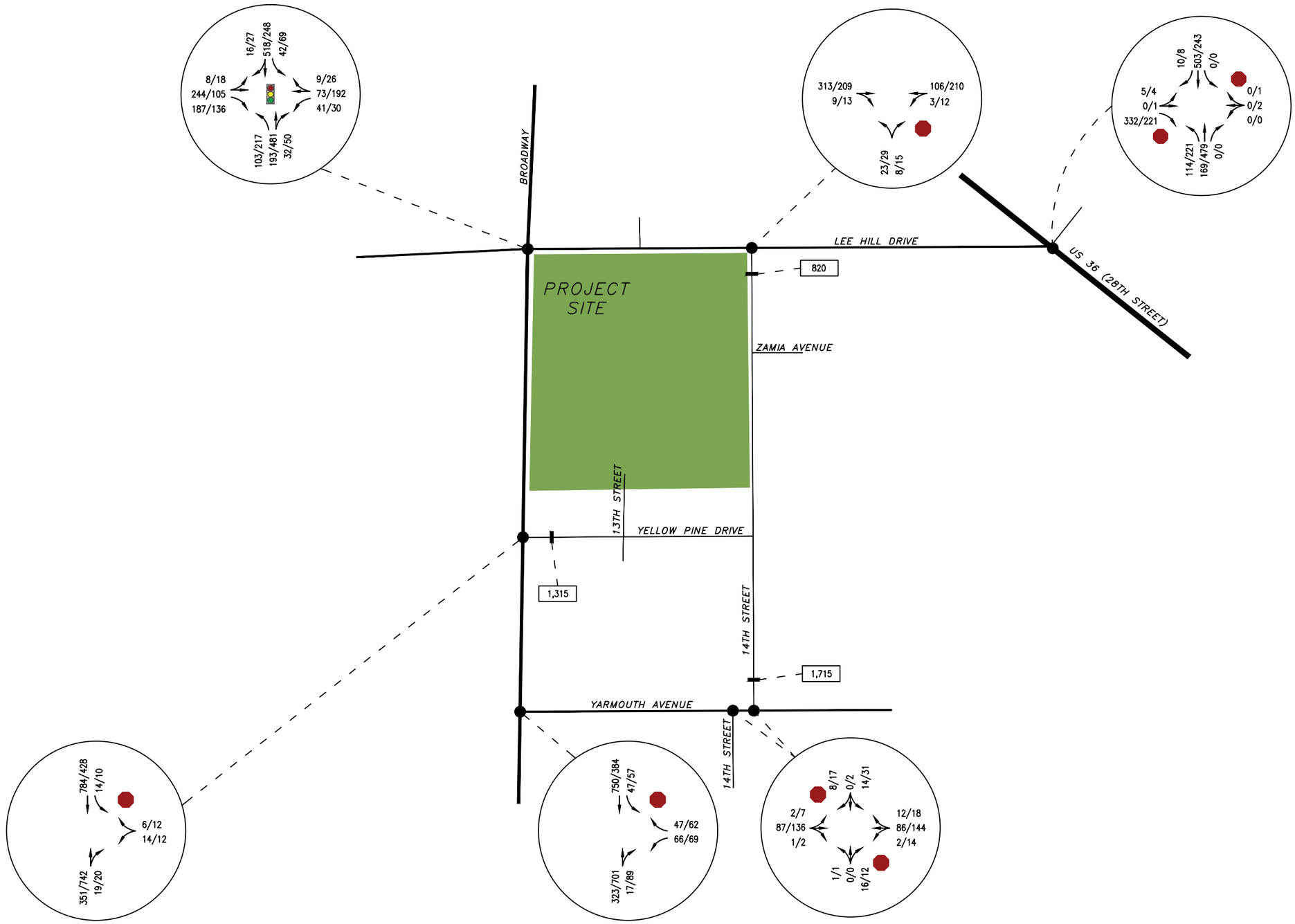
NORTH BOULDER ARMORY REDEVELOPMENT

2016 EXISTING TRAFFIC VOLUMES

FT Project #	14023	Original Scale	NTS	Date	3/18/16	Drawn by	CRS	Figure #	3



KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME

X,XXX WEEKDAY DAILY TRAFFIC VOLUME

LANE CONFIGURATION

N

FOX TUTTLE HERNANDEZ
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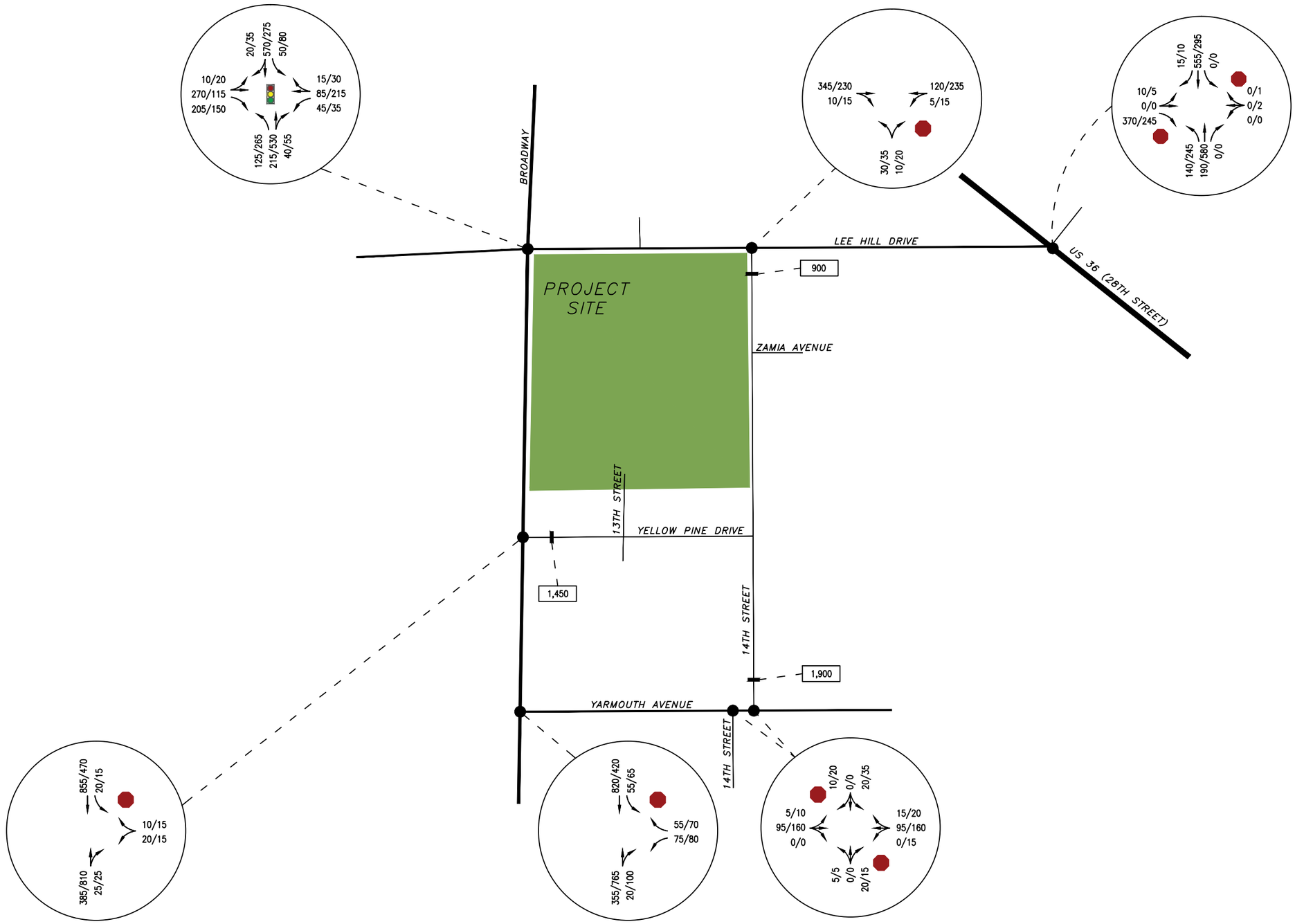
NORTH BOULDER ARMORY REDVELOPMENT

YEAR 2018 BACKGROUND TRAFFIC VOLUMES

FT Project #	14023	Original Scale	NTS	Date	3/18/16	Drawn by	CRS	Figure #	4



KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME

X,XXX WEEKDAY DAILY TRAFFIC VOLUME

LANE CONFIGURATION

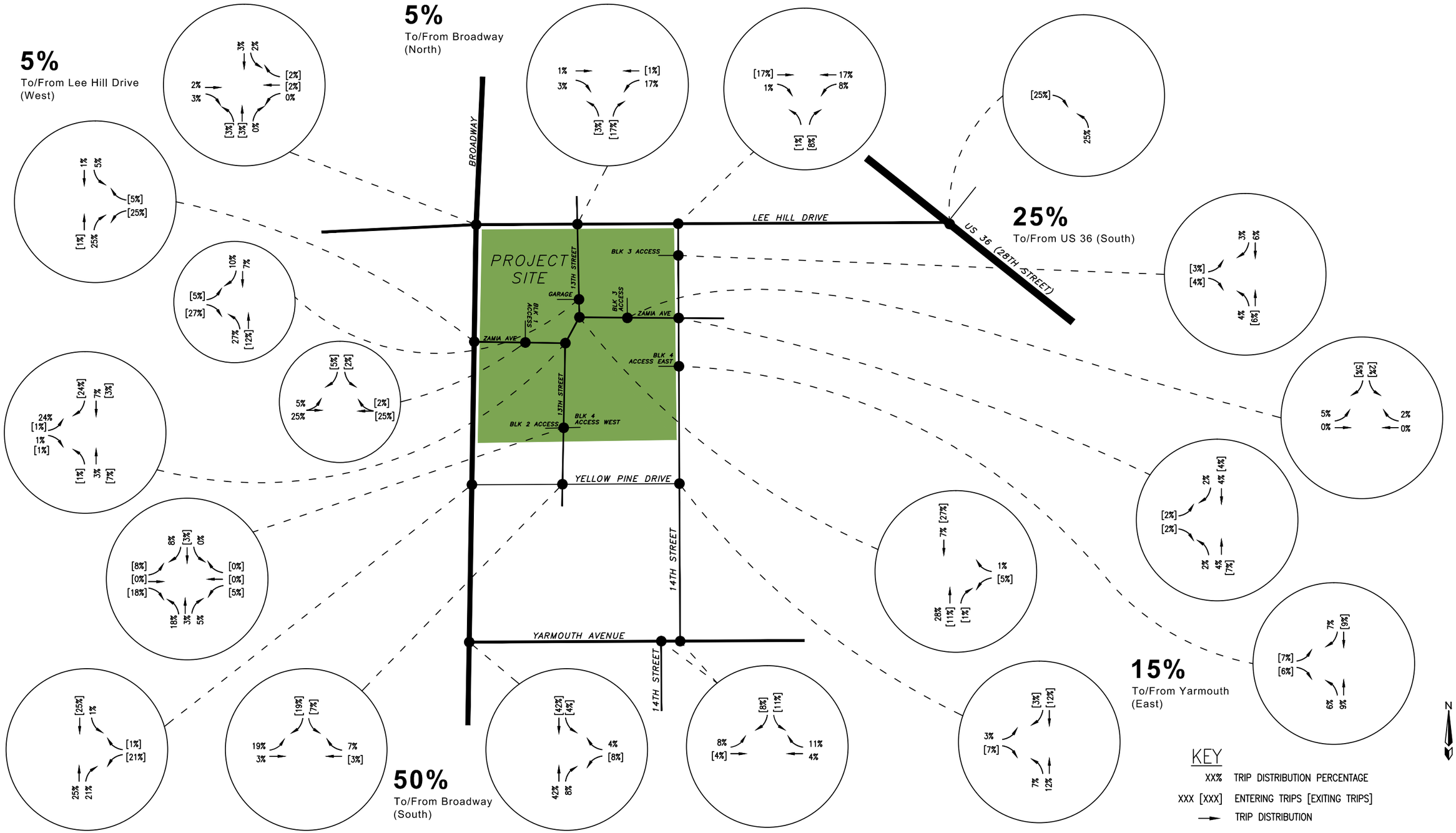
N

FOX TUTTLE HERNANDEZ
TRANSPORTATION GROUP

NORTH BOULDER ARMORY REDVELOPMENT

YEAR 2035 BACKGROUND TRAFFIC VOLUMES

FT Project #	14023	Original Scale	NTS	Date	3/18/15	Drawn by	CRS	Figure #	5



FOX TUTTLE HERNANDEZ
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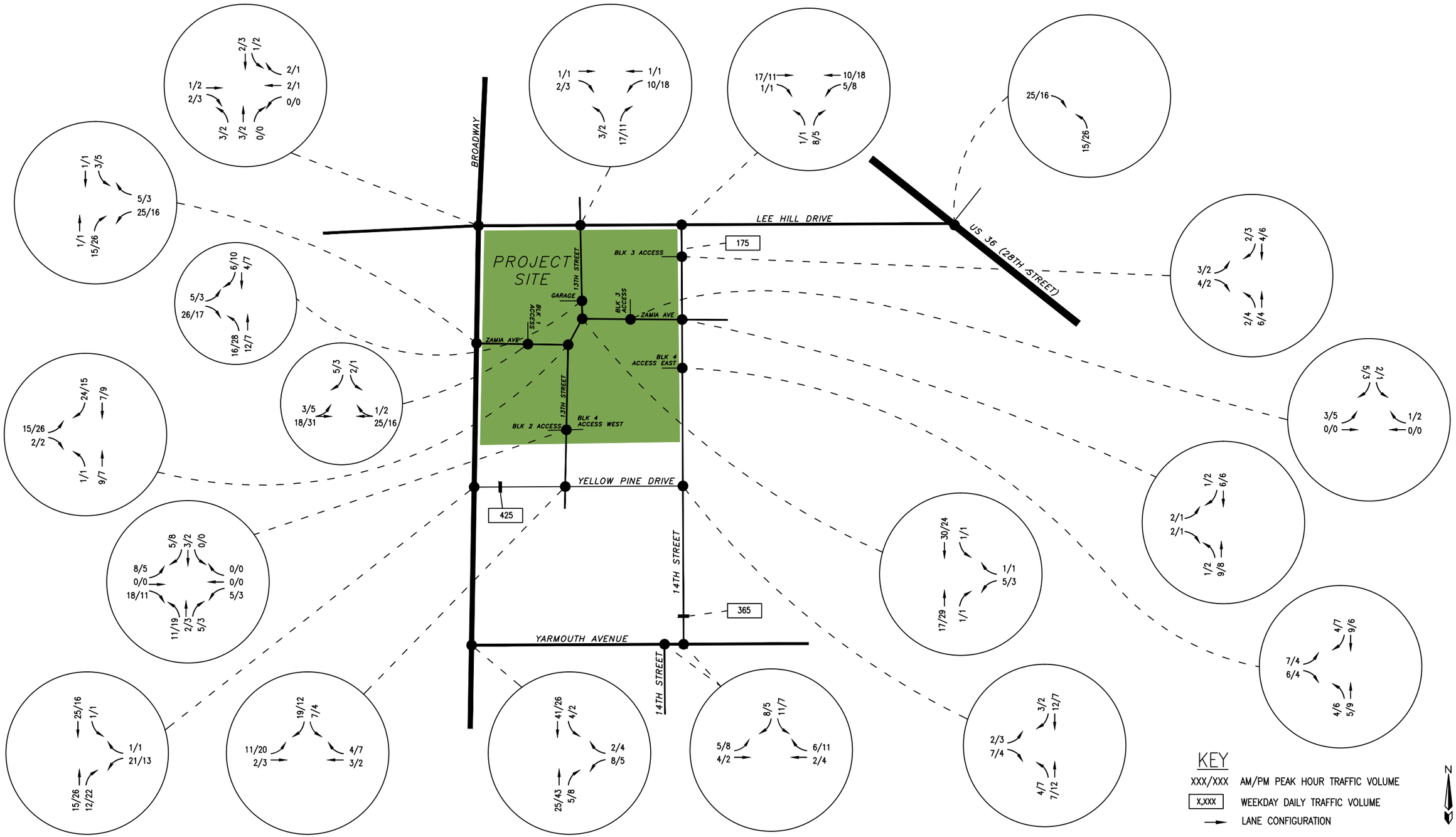
NORTH BOULDER ARMORY REDVELOPMENT

TRIP DISTRIBUTION

FT Project #	14023	Original Scale	NTS	Date	3/18/16	Drawn by	CRS	Figure #	6

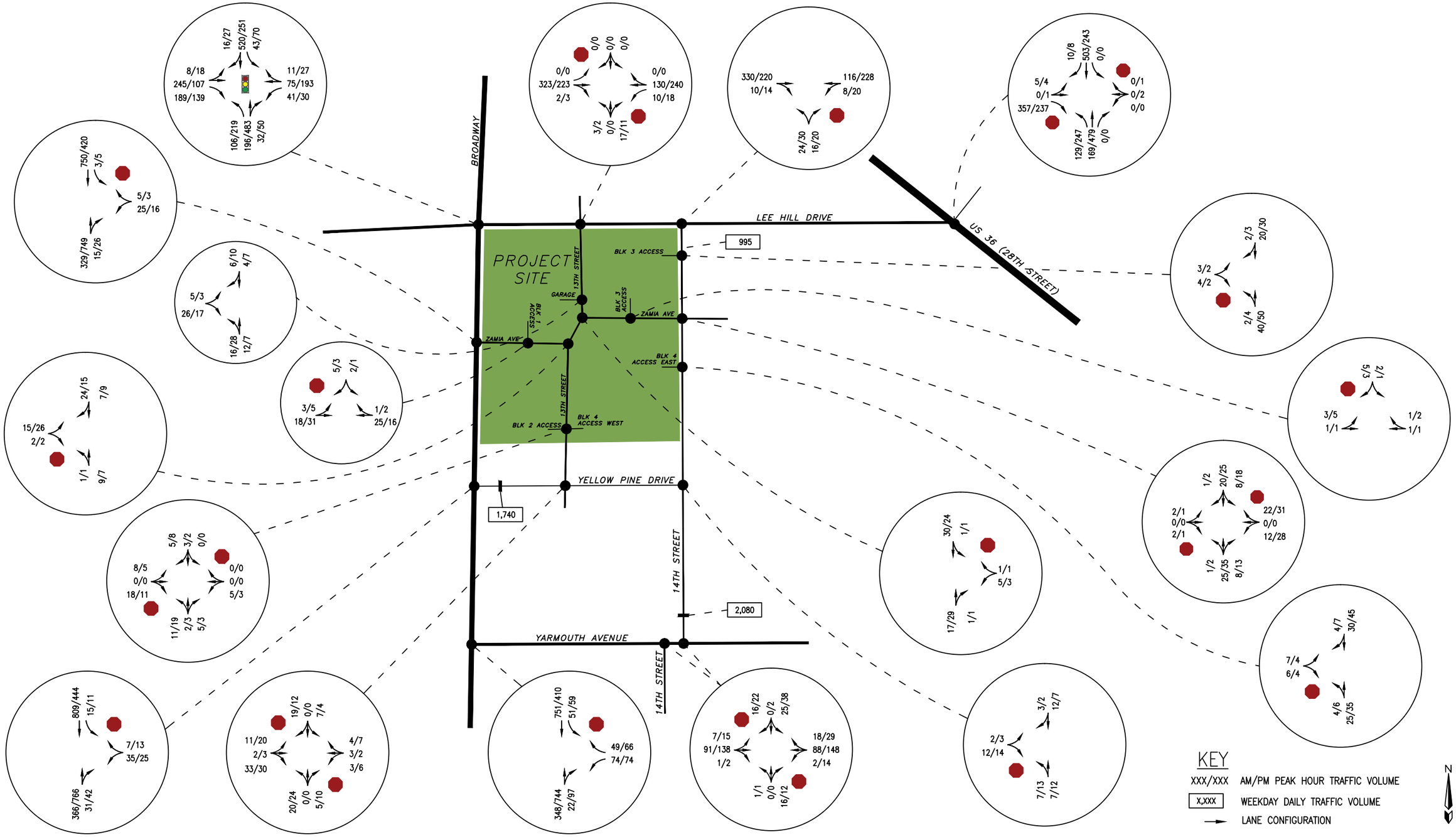


FOX TUTTLE HERNANDEZ
TRANSPORTATION GROUP

NORTH BOULDER ARMORY REDVELOPMENT

SITE-GENERATED TRAFFIC VOLUMES

FT Project #	14023	Original Scale	NTS	Date	3/18/16	Drawn by	CRS	Figure # 7

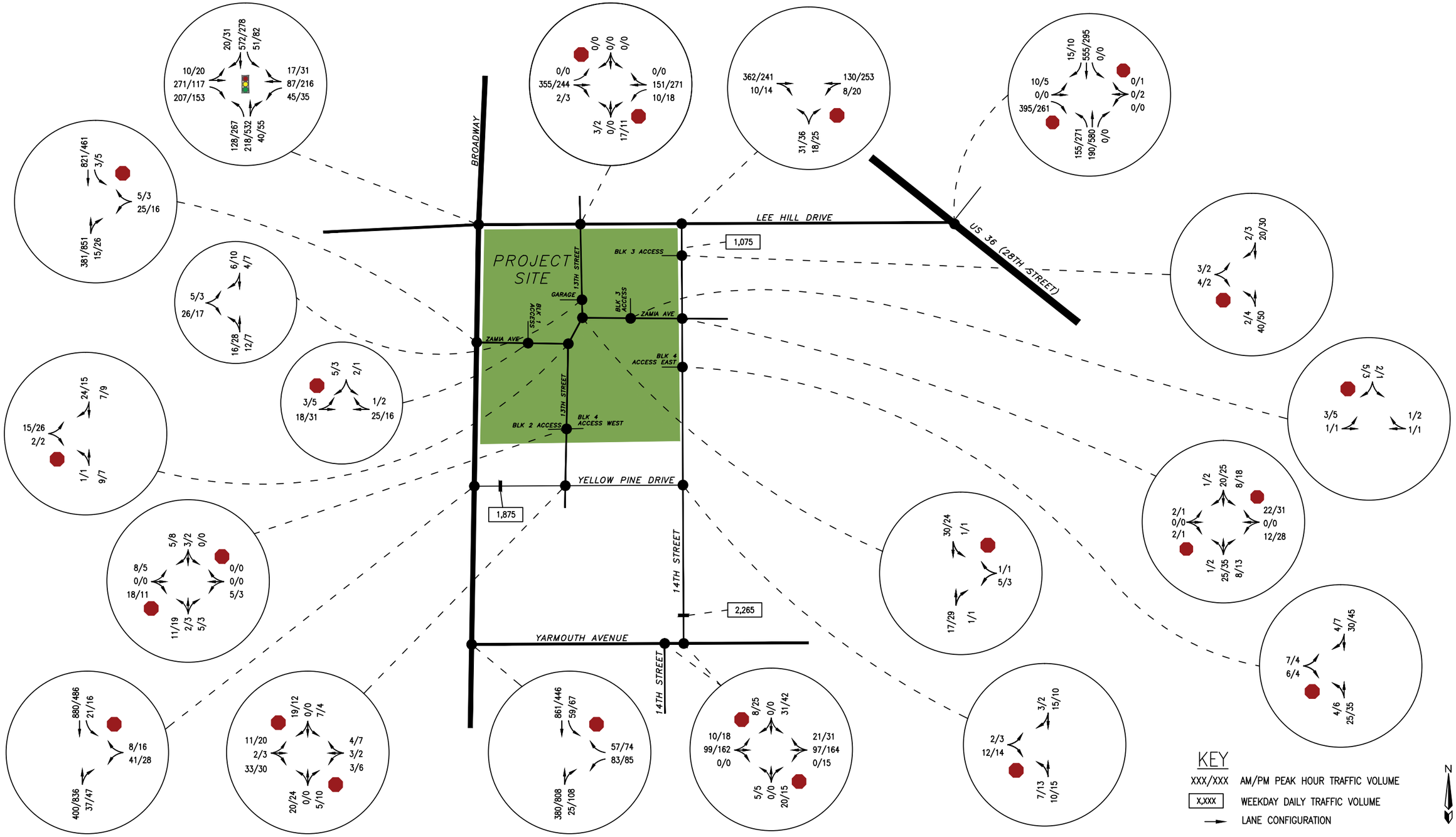


FOX TUTTLE HERNANDEZ
TRANSPORTATION GROUP

NORTH BOULDER ARMORY REDVELOPMENT

YEAR 2018 BACKGROUND + SITE GENERATED TRAFFIC VOLUMES

FT Project #	14023	Original Scale	NTS	Date	3/18/16	Drawn by	CRS	Figure #	8



FOX TUTTLE HERNANDEZ
TRANSPORTATION GROUP

NORTH BOULDER ARMORY REDVELOPMENT

YEAR 2035 BACKGROUND + SITE GENERATED TRAFFIC VOLUMES

FT Project #	14023	Original Scale	NTS	Date	4/20/15	Drawn by	CRS	Figure #	9

Appendix:

Level of Service Definitions

Existing Traffic Data

Trip Generation References

Intersection Capacity Worksheets

Level of Service Definitions

LEVEL OF SERVICE DEFINITIONS

In rating roadway and intersection operating conditions with existing or future traffic volumes, "Levels of Service" (LOS) A through F are used, with LOS A indicating very good operation and LOS F indicating poor operation. Levels of service at signalized and unsignalized intersections are closely associated with vehicle delays experienced in seconds per vehicle. More complete level of service definitions and delay data for signal and stop sign controlled intersections are contained in the following table for reference.

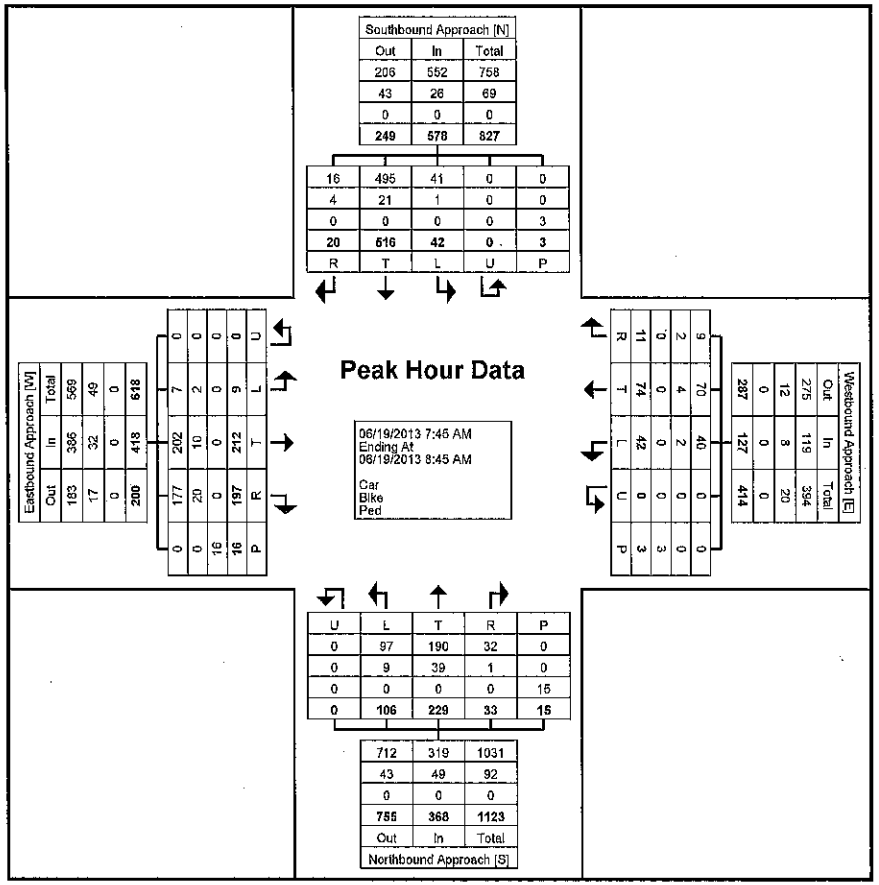
Level of Service Rating	Delay in seconds per vehicle *(a)*		Definition
	Signalized	Unsignalized	
A	0.0 to 10.0	0.0 to 10.0	Low vehicular traffic volumes; primarily free flow operations. Density is low and vehicles can freely maneuver within the traffic stream. Drivers are able to maintain their desired speeds with little or no delay.
B	10.1 to 20.0	10.1 to 15.0	Stable vehicular traffic volume flow with potential for some restriction of operating speeds due to traffic conditions. Vehicle maneuvering is only slightly restricted. The stopped delays are not bothersome and drivers are not subject to appreciable tension.
C	20.1 to 35.0	15.1 to 25.0	Stable traffic operations, however the ability for vehicles to maneuver is more restricted by the increase in traffic volumes. Relatively satisfactory operating speeds prevail, but adverse signal coordination or longer vehicle queues cause delays along the corridor.
D	35.1 to 55.0	25.1 to 35.0	Approaching unstable vehicular traffic flow where small increases in volume could cause substantial delays. Most drivers are restricted in ability to maneuver and selection of travel speeds due to congestion. Driver comfort and convenience are low, but tolerable.
E	55.1 to 80.0	35.1 to 50.0	Traffic operations characterized by significant approach delays and average travel speeds of one-half to one-third the free flow speed. Vehicular flow is unstable and there is potential for stoppages of brief duration. High signal density, extensive vehicle queuing, or corridor signal progression/timing are the typical causes of vehicle delays at signalized corridors.
F	> 80.0	> 50.0	Forced vehicular traffic flow and operations with high approach delays at critical intersections. Vehicle speeds are reduced substantially and stoppages may occur for short or long periods of time because of downstream congestion.

(a) Delay ranges based on 2010 Highway Capacity Manual criteria.

Existing Traffic Data

City of Boulder (CO)
1777 Broadway
P.O. Box 791
Boulder, Colorado, United States 80306
303.441.3266 stringhamm@bouldercolorado.gov

Count Name: Broadway and Leehill TMC 6-19-2013 S.W. corner
Site Code: 129
Start Date: 06/19/2013
Page No: 4



Turning Movement Peak Hour Data Plot (7:45 AM)

City of Boulder (CO)
1777 Broadway
P.O. Box 791
Boulder, Colorado, United States 80306
303.441.3266 stringhamm@bouldercolorado.gov

Count Name: Broadway and Leehill TMC 6-19-2013 S.W. corner
Site Code: 129
Start Date: 06/19/2013

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Southbound Approach						Westbound Approach						Northbound Approach						Eastbound Approach						
	Southbound						Westbound						Northbound						Eastbound						
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total
7:45 AM	11	152	8	0	1	171	2	24	6	0	0	32	10	61	20	0	1	91	67	59	3	0	9	129	423
8:00 AM	2	141	13	0	2	156	5	16	12	0	1	33	4	50	23	0	3	77	39	49	2	0	4	90	356
8:15 AM	3	131	10	0	0	144	3	14	12	0	1	29	7	55	30	0	3	92	48	53	2	0	1	103	368
8:30 AM	4	92	11	0	0	107	1	20	12	0	1	33	12	63	33	0	8	108	43	51	2	0	2	96	344
Total	20	516	42	0	3	578	11	74	42	0	3	127	33	229	106	0	15	368	197	212	9	0	16	418	1491
Approach %	3.5	89.3	7.3	0.0	-	-	8.7	58.3	33.1	0.0	-	-	9.0	62.2	28.8	0.0	-	-	47.1	50.7	2.2	0.0	-	-	-
Total %	1.3	34.6	2.8	0.0	-	38.8	0.7	5.0	2.8	0.0	-	8.5	2.2	15.4	7.1	0.0	-	24.7	13.2	14.2	0.6	0.0	-	28.0	-
PHF	0.455	0.849	0.808	0.000	-	0.845	0.550	0.771	0.875	0.000	-	0.962	0.688	0.909	0.803	0.000	-	0.852	0.735	0.898	0.750	0.000	-	0.810	0.881
Car	16	495	41	0	-	552	9	70	40	0	-	119	32	190	97	0	-	319	177	202	7	0	-	386	1376
% Car	80.0	95.9	97.6	-	-	95.5	81.8	94.6	95.2	-	-	93.7	97.0	83.0	91.5	-	-	86.7	89.8	95.3	77.8	-	-	92.3	92.3
Bike	4	21	1	0	-	26	2	4	2	0	-	8	1	39	9	0	-	49	20	10	2	0	-	32	115
% Bike	20.0	4.1	2.4	-	-	4.5	18.2	5.4	4.8	-	-	6.3	3.0	17.0	8.5	-	-	13.3	10.2	4.7	22.2	-	-	7.7	7.7
Ped	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	15	-	-	-	-	-	16	-	-
% Ped	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

City of Boulder (CO)
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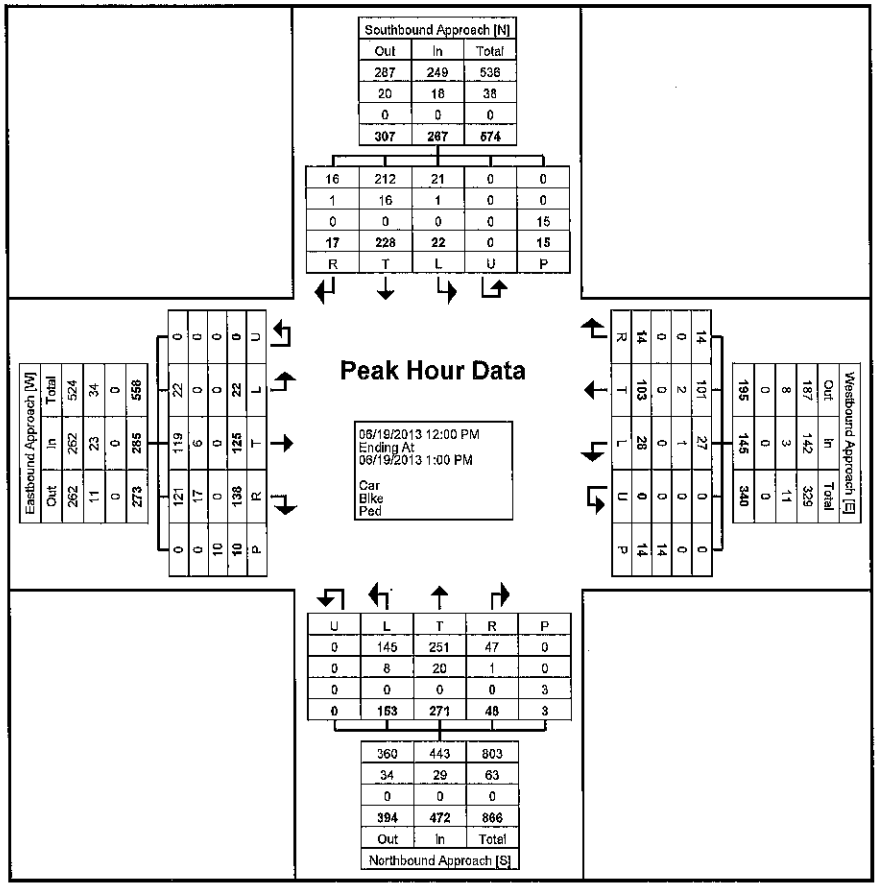

Turning Movement Peak Hour Data Plot (12:00 PM)

City of Boulder (CO)
1777 Broadway
P.O. Box 791
Boulder, Colorado, United States 80306
303.441.3266 stringhamm@bouldercolorado.gov

Count Name: Broadway and Leehill TMC 6-19-2013 S.W. corner
Site Code: 129
Start Date: 06/19/2013

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Southbound Approach Southbound						Westbound Approach Westbound						Northbound Approach Northbound						Eastbound Approach Eastbound						
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total
12:00 PM	4	52	4	0	0	60	5	30	10	0	5	45	19	73	36	0	0	128	34	32	6	0	0	72	305
12:15 PM	5	57	5	0	5	67	1	14	7	0	6	22	6	64	41	0	0	111	36	25	6	0	1	67	267
12:30 PM	1	53	6	0	6	60	3	29	8	0	2	40	12	76	37	0	0	125	36	31	6	0	5	73	298
12:45 PM	7	66	7	0	4	80	5	30	3	0	1	38	11	58	39	0	3	108	32	37	4	0	4	73	299
Total	17	228	22	0	15	267	14	103	28	0	14	145	48	271	153	0	3	472	138	125	22	0	10	285	1169
Approach %	6.4	85.4	8.2	0.0	-	-	9.7	71.0	19.3	0.0	-	-	10.2	57.4	32.4	0.0	-	-	48.4	43.9	7.7	0.0	-	-	-
Total %	1.5	19.5	1.9	0.0	-	22.8	1.2	8.8	2.4	0.0	-	12.4	4.1	23.2	13.1	0.0	-	40.4	11.8	10.7	1.9	0.0	-	24.4	-
PHF	0.607	0.864	0.786	0.000	-	0.834	0.700	0.858	0.700	0.000	-	0.806	0.632	0.891	0.933	0.000	-	0.922	0.958	0.845	0.917	0.000	-	0.976	0.958
Car	16	212	21	0	-	249	14	101	27	0	-	142	47	251	145	0	-	443	121	119	22	0	-	262	1096
% Car	94.1	93.0	95.5	-	-	93.3	100.0	98.1	96.4	-	-	97.9	97.9	92.6	94.8	-	-	93.9	87.7	95.2	100.0	-	-	91.9	93.8
Bike	1	16	1	0	-	18	0	2	1	0	-	3	1	20	8	0	-	29	17	6	0	0	-	23	73
% Bike	5.9	7.0	4.5	-	-	6.7	0.0	1.9	3.6	-	-	2.1	2.1	7.4	5.2	-	-	6.1	12.3	4.8	0.0	-	-	8.1	6.2
Ped	-	-	-	-	15	-	-	-	-	-	14	-	-	-	-	-	3	-	-	-	-	-	10	-	-
% Ped	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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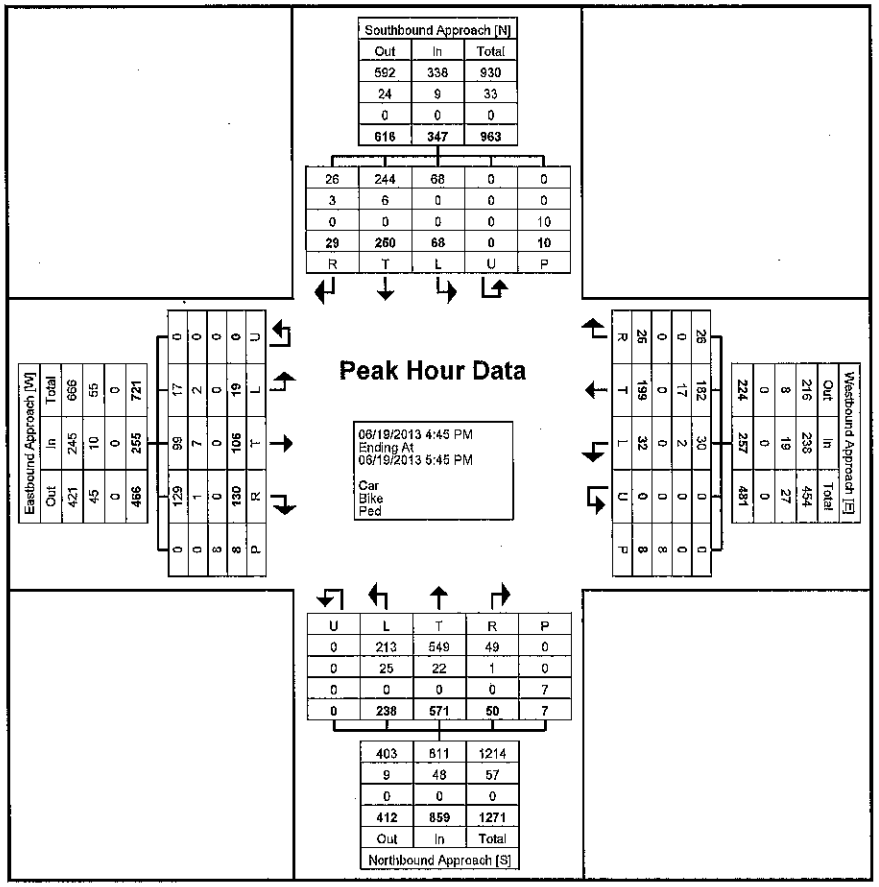


Turning Movement Peak Hour Data Plot (4:45 PM)

City of Boulder (CO)
1777 Broadway
P.O. Box 791
Boulder, Colorado, United States 80306
303.441.3266 stringhamm@bouldercolorado.gov

Count Name: Broadway and Leehill TMC 6-19-2013 S.W. corner
Site Code: 129
Start Date: 06/19/2013

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Southbound Approach Southbound						Westbound Approach Westbound						Northbound Approach Northbound						Eastbound Approach Eastbound						
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total
4:45 PM	4	71	16	0	5	91	4	49	5	0	4	58	10	141	52	0	4	203	35	22	3	0	4	60	412
5:00 PM	9	61	19	0	3	89	9	42	9	0	2	60	14	139	65	0	1	218	31	27	7	0	1	65	432
5:15 PM	8	58	19	0	0	85	6	49	11	0	0	66	12	151	58	0	1	221	34	32	3	0	3	69	441
5:30 PM	8	60	14	0	2	82	7	59	7	0	2	73	14	140	63	0	1	217	30	25	6	0	0	61	433
Total	29	250	68	0	10	347	26	199	32	0	8	257	50	571	238	0	7	859	130	106	19	0	8	255	1718
Approach %	8.4	72.0	19.6	0.0	-	-	10.1	77.4	12.5	0.0	-	-	5.8	66.5	27.7	0.0	-	-	51.0	41.6	7.5	0.0	-	-	-
Total %	1.7	14.6	4.0	0.0	-	20.2	1.5	11.6	1.9	0.0	-	15.0	2.9	33.2	13.9	0.0	-	50.0	7.6	6.2	1.1	0.0	-	14.8	-
PHF	0.806	0.880	0.895	0.000	-	0.953	0.722	0.843	0.727	0.000	-	0.880	0.893	0.945	0.915	0.000	-	0.972	0.929	0.828	0.679	0.000	-	0.924	0.974
Car	26	244	68	0	-	338	26	182	30	0	-	238	49	549	213	0	-	811	129	99	17	0	-	245	1632
% Car	89.7	97.6	100.0	-	-	97.4	100.0	91.5	93.8	-	-	92.6	98.0	96.1	89.5	-	-	94.4	99.2	93.4	89.5	-	-	96.1	95.0
Bike	3	6	0	0	-	9	0	17	2	0	-	19	1	22	25	0	-	48	1	7	2	0	-	10	86
% Bike	10.3	2.4	0.0	-	-	2.6	0.0	8.5	6.3	-	-	7.4	2.0	3.9	10.5	-	-	5.6	0.8	6.6	10.5	-	-	3.9	5.0
Ped	-	-	-	-	10	-	-	-	-	-	8	-	-	-	-	-	7	-	-	-	-	-	8	-	-
% Ped	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 28TH ST
E/W STREET: LEE HILL DR
CITY: BOULDER
COUNTY: BOULDER

File Name : 28THLEE
Site Code : 00000022
Start Date : 11/19/2014
Page No : 1

Groups Printed- VEHICLES

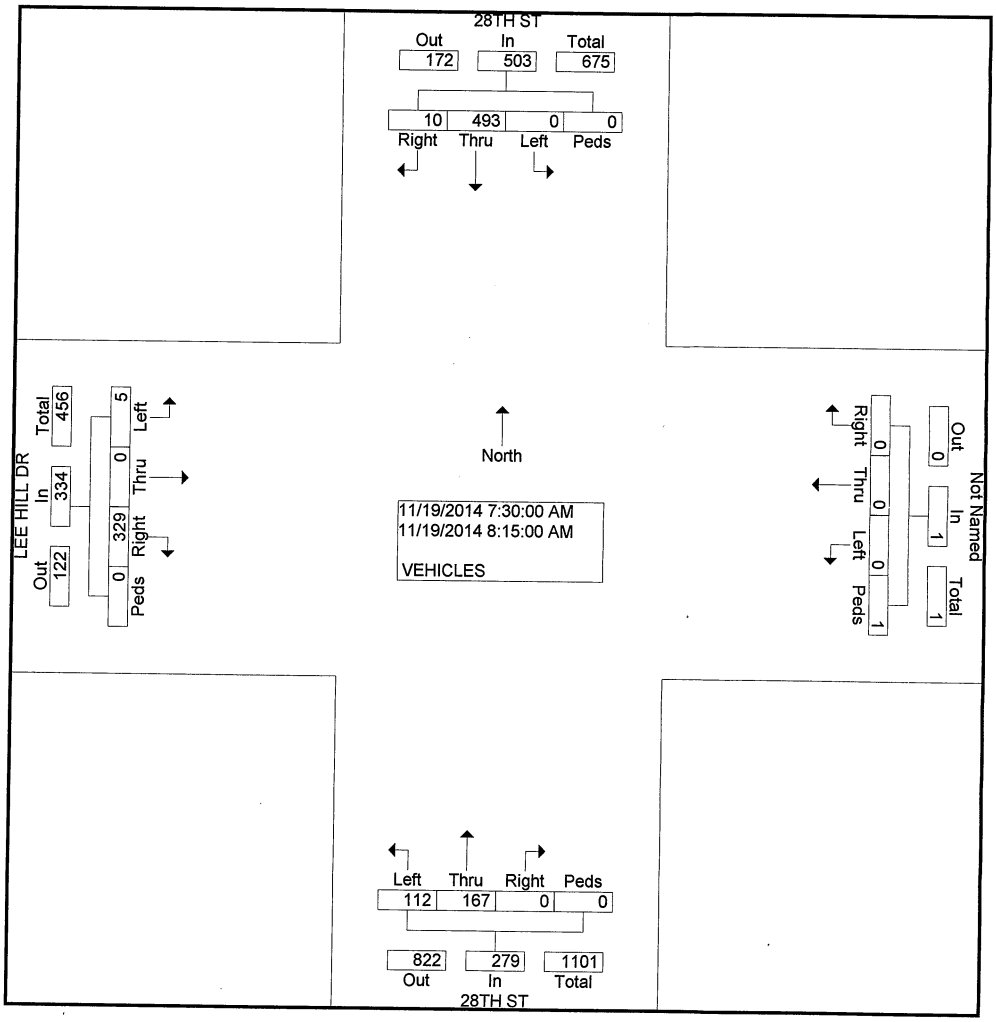
	28TH ST Southbound				Westbound				28TH ST Northbound				LEE HILL DR Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	49	1	0	0	0	0	0	20	18	0	0	0	0	38	0	126
07:15 AM	0	83	4	0	0	0	0	0	24	33	0	0	1	0	62	0	207
07:30 AM	0	112	0	0	0	0	0	0	21	31	0	0	0	0	76	0	240
07:45 AM	0	115	5	0	0	0	0	0	37	52	0	0	1	0	93	0	303
Total	0	359	10	0	0	0	0	0	102	134	0	0	2	0	269	0	876
08:00 AM	0	139	1	0	0	0	0	0	30	38	0	0	2	0	79	0	289
08:15 AM	0	127	4	0	0	0	0	1	24	46	0	0	2	0	81	0	285
08:30 AM	0	102	2	0	0	0	0	1	43	50	0	0	1	3	68	2	272
08:45 AM	0	105	2	0	0	0	0	1	27	59	0	0	1	0	71	1	267
Total	0	473	9	0	0	0	0	3	124	193	0	0	6	3	299	3	1113
04:00 PM	0	68	0	0	0	0	0	0	57	119	0	0	2	0	42	0	288
04:15 PM	0	61	4	0	0	0	0	1	46	102	0	0	0	0	39	0	253
04:30 PM	0	59	2	0	0	0	0	0	51	118	0	0	2	0	58	0	290
04:45 PM	0	53	2	0	0	0	0	0	48	113	0	0	0	1	55	1	273
Total	0	241	8	0	0	0	0	1	202	452	0	0	4	1	194	1	1104
05:00 PM	0	65	0	0	0	2	1	0	59	137	0	0	2	0	52	0	318
05:15 PM	0	47	1	0	0	0	0	0	56	136	0	0	2	0	45	0	287
05:30 PM	0	52	1	0	3	0	0	0	80	136	2	0	1	0	52	0	327
05:45 PM	0	48	1	0	1	0	0	0	52	118	0	0	3	1	41	0	265
Total	0	212	3	0	4	2	1	0	247	527	2	0	8	1	190	0	1197
Grand Total	0	1285	30	0	4	2	1	4	675	1306	2	0	20	5	952	4	4290
Apprch %	0.0	97.7	2.3	0.0	36.4	18.2	9.1	36.4	34.0	65.9	0.1	0.0	2.0	0.5	97.0	0.4	
Total %	0.0	30.0	0.7	0.0	0.1	0.0	0.0	0.1	15.7	30.4	0.0	0.0	0.5	0.1	22.2	0.1	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 28TH ST
E/W STREET: LEE HILL DR
CITY: BOULDER
COUNTY: BOULDER

File Name : 28THLEE
Site Code : 00000022
Start Date : 11/19/2014
Page No : 2

	28TH ST Southbound					Westbound					28TH ST Northbound					LEE HILL DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	07:30 AM																				
Volume	0	493	10	0	503	0	0	0	1	1	112	167	0	0	279	5	0	329	0	334	1117
Percent	0.0	98.0	2.0	0.0		0.0	0.0	0.0	100.0		40.1	59.9	0.0	0.0		1.5	0.0	98.5	0.0		
07:45 Volume	0	115	5	0	120	0	0	0	0	0	37	52	0	0	89	1	0	93	0	94	303
Peak Factor																					0.922
High Int.	08:00 AM					08:15 AM					07:45 AM					07:45 AM					
Volume	0	139	1	0	140	0	0	0	1	1	37	52	0	0	89	1	0	93	0	94	
Peak Factor					0.898					0.250					0.784					0.888	

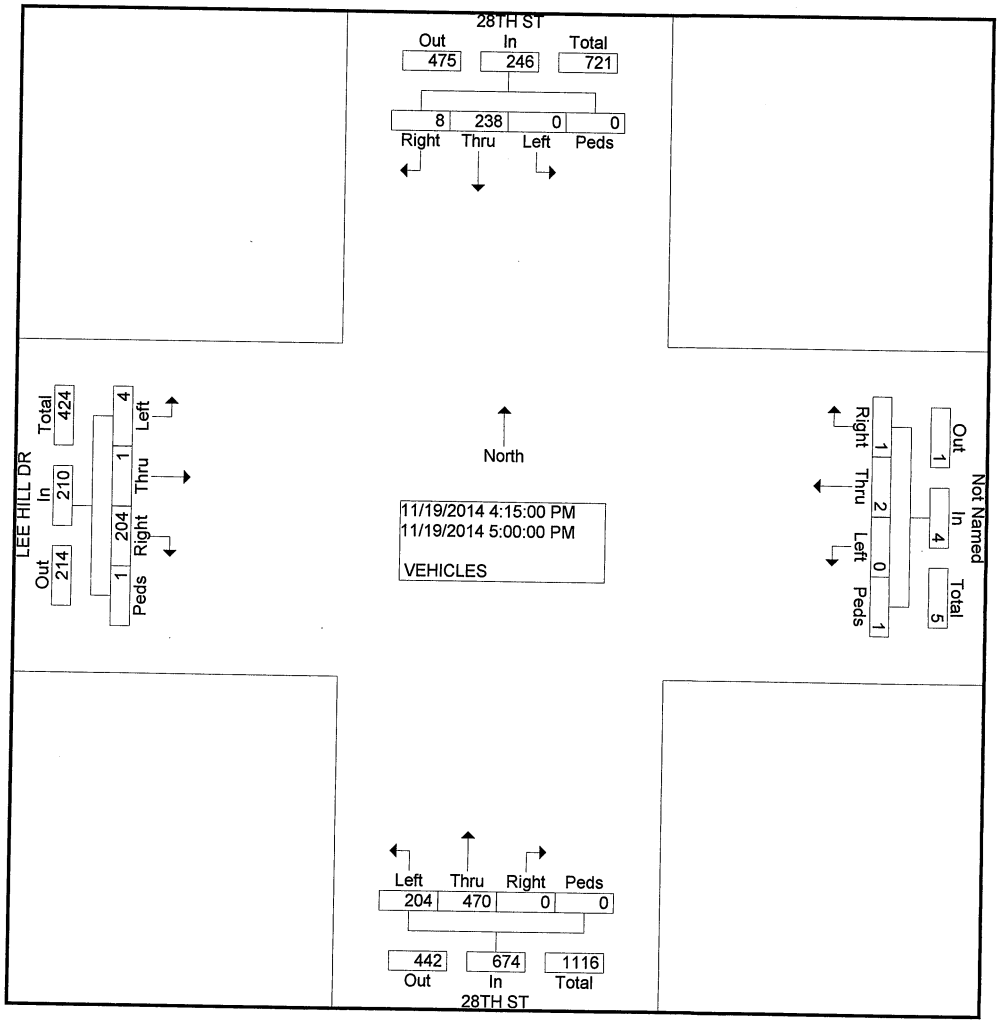


COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 28TH ST
E/W STREET: LEE HILL DR
CITY: BOULDER
COUNTY: BOULDER

File Name : 28THLEE
Site Code : 00000022
Start Date : 11/19/2014
Page No : 2

	28TH ST Southbound					Westbound					28TH ST Northbound					LEE HILL DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	0	238	8	0	246	0	2	1	1	4	204	470	0	0	674	4	1	204	1	210	1134
Percent	0.0	96.7	3.3	0.0		0.0	50.0	25.0	25.0		30.3	69.7	0.0	0.0		1.9	0.5	97.1	0.5		
05:00 Volume	0	65	0	0	65	0	2	1	0	3	59	137	0	0	196	2	0	52	0	54	318
Peak Factor																					0.892
High Int.	04:15 PM					05:00 PM					05:00 PM					04:30 PM					
Volume	0	61	4	0	65	0	2	1	0	3	59	137	0	0	196	2	0	58	0	60	
Peak Factor					0.946					0.333					0.860					0.875	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: BROADWAY ST
E/W STREET: YELLOW PINE DR
CITY: BOULDER
COUNTY: BOULDER

File Name : BROAYELL
Site Code : 00000005
Start Date : 11/6/2014
Page No : 1

Groups Printed- VEHICLES

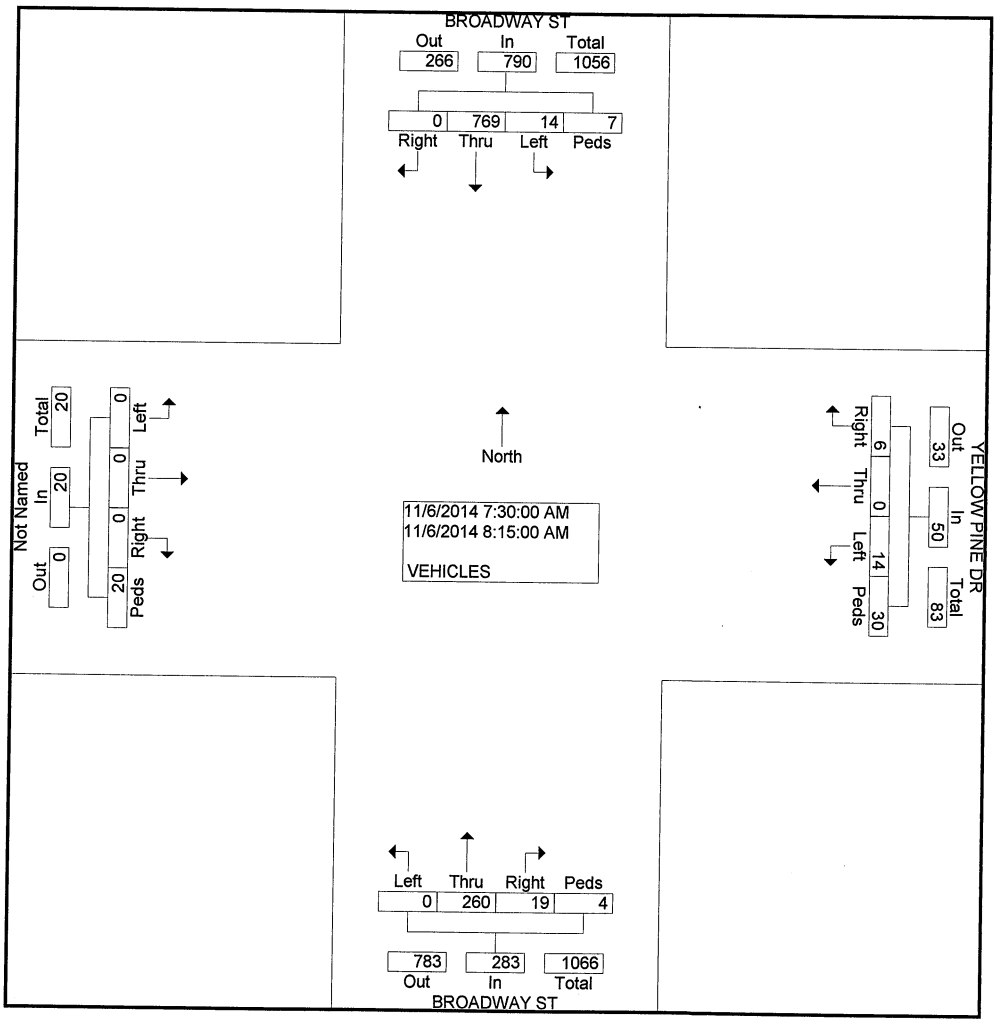
	BROADWAY ST Southbound				YELLOW PINE DR Westbound				BROADWAY ST Northbound				Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	106	0	1	1	0	2	7	0	28	1	1	0	0	0	1	148
07:15 AM	6	138	0	0	5	0	0	6	0	41	2	2	0	0	0	1	201
07:30 AM	3	196	0	2	3	0	1	7	0	48	4	1	0	0	0	1	266
07:45 AM	4	191	0	1	2	0	3	7	0	62	6	0	0	0	0	5	281
Total	13	631	0	4	11	0	6	27	0	179	13	4	0	0	0	8	896
08:00 AM	4	199	0	2	4	0	1	10	0	73	3	2	0	0	0	9	307
08:15 AM	3	183	0	2	5	0	1	6	0	77	6	1	0	0	0	5	289
08:30 AM	7	151	0	0	2	0	5	9	0	79	6	0	0	0	0	1	260
08:45 AM	0	139	0	1	3	0	2	8	0	94	12	0	0	0	0	1	260
Total	14	672	0	5	14	0	9	33	0	323	27	3	0	0	0	16	1116
04:00 PM	1	117	0	0	6	0	1	0	0	157	8	0	0	0	0	3	293
04:15 PM	5	114	0	0	3	0	2	8	0	172	7	0	0	0	0	4	315
04:30 PM	0	101	0	1	2	0	5	14	0	180	6	0	0	0	0	4	313
04:45 PM	1	92	0	0	5	0	1	11	0	185	3	0	0	0	0	0	298
Total	7	424	0	1	16	0	9	33	0	694	24	0	0	0	0	11	1219
05:00 PM	4	112	0	2	2	0	4	5	0	190	4	0	0	0	0	2	325
05:15 PM	0	85	0	3	4	0	2	2	0	182	8	0	0	0	0	0	286
05:30 PM	6	94	0	0	6	0	3	6	0	149	12	0	0	0	0	0	276
05:45 PM	8	91	0	0	9	0	2	7	0	114	3	0	0	0	0	1	235
Total	18	382	0	5	21	0	11	20	0	635	27	0	0	0	0	3	1122
Grand Total	52	2109	0	15	62	0	35	113	0	1831	91	7	0	0	0	38	4353
Apprch %	2.4	96.9	0.0	0.7	29.5	0.0	16.7	53.8	0.0	94.9	4.7	0.4	0.0	0.0	0.0	100.0	
Total %	1.2	48.4	0.0	0.3	1.4	0.0	0.8	2.6	0.0	42.1	2.1	0.2	0.0	0.0	0.0	0.9	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: BROADWAY ST
E/W STREET: YELLOW PINE DR
CITY: BOULDER
COUNTY: BOULDER

File Name : BROAYELL
Site Code : 00000005
Start Date : 11/6/2014
Page No : 2

	BROADWAY ST Southbound					YELLOW PINE DR Westbound					BROADWAY ST Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 07:00 AM to 09:00 AM - Peak 1 of 1																					
Intersection	07:30 AM																				
Volume	14	769	0	7	790	14	0	6	30	50	0	260	19	4	283	0	0	0	20	20	1143
Percent	1.8	97.3	0.0	0.9		28.0	0.0	12.0	60.0		0.0	91.9	6.7	1.4		0.0	0.0	0.0	100.0		
08:00 Volume	4	199	0	2	205	4	0	1	10	15	0	73	3	2	78	0	0	0	9	9	307
Peak Factor																					0.931
High Int.	08:00 AM					08:00 AM					08:15 AM					08:00 AM					
Volume	4	199	0	2	205	4	0	1	10	15	0	77	6	1	84	0	0	0	9	9	
Peak Factor					0.963					0.833					0.842					0.556	

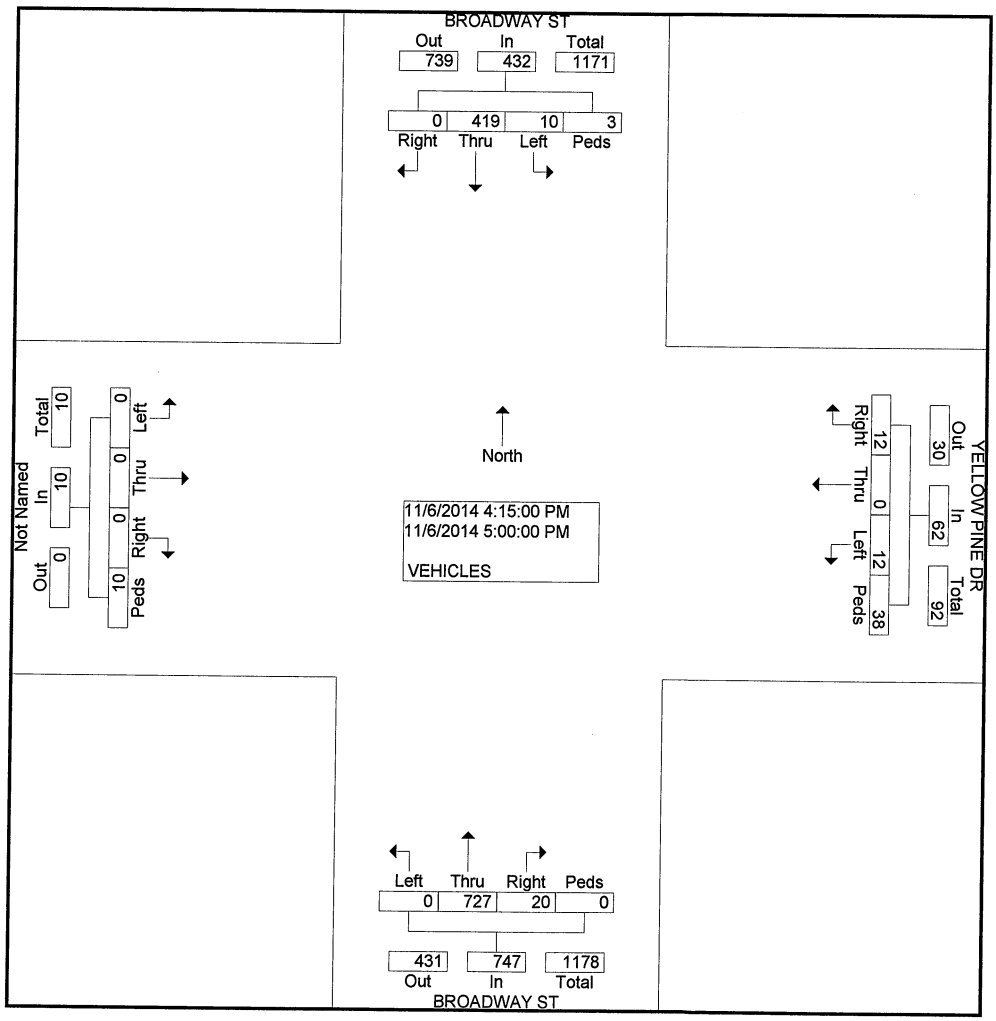


COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: BROADWAY ST
E/W STREET: YELLOW PINE DR
CITY: BOULDER
COUNTY: BOULDER

File Name : BROAYELL
Site Code : 00000005
Start Date : 11/6/2014
Page No : 2

	BROADWAY ST Southbound					YELLOW PINE DR Westbound					BROADWAY ST Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	10	419	0	3	432	12	0	12	38	62	0	727	20	0	747	0	0	0	10	10	1251
Percent	2.3	97.0	0.0	0.7		19.4	0.0	19.4	61.3		0.0	97.3	2.7	0.0		0.0	0.0	0.0	100.0		
05:00 Volume	4	112	0	2	118	2	0	4	5	11	0	190	4	0	194	0	0	0	2	2	325
Peak Factor																					0.962
High Int.	04:15 PM					04:30 PM					05:00 PM					04:15 PM					
Volume	5	114	0	0	119	2	0	5	14	21	0	190	4	0	194	0	0	0	4	4	
Peak Factor					0.908					0.738					0.963					0.625	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 14TH ST
E/W STREET: LEE HILL DR
CITY: BOULDER
COUNTY: BOULDER

File Name : 14THLEEH
Site Code : 00000005
Start Date : 11/5/2014
Page No : 1

Groups Printed- VEHICLES

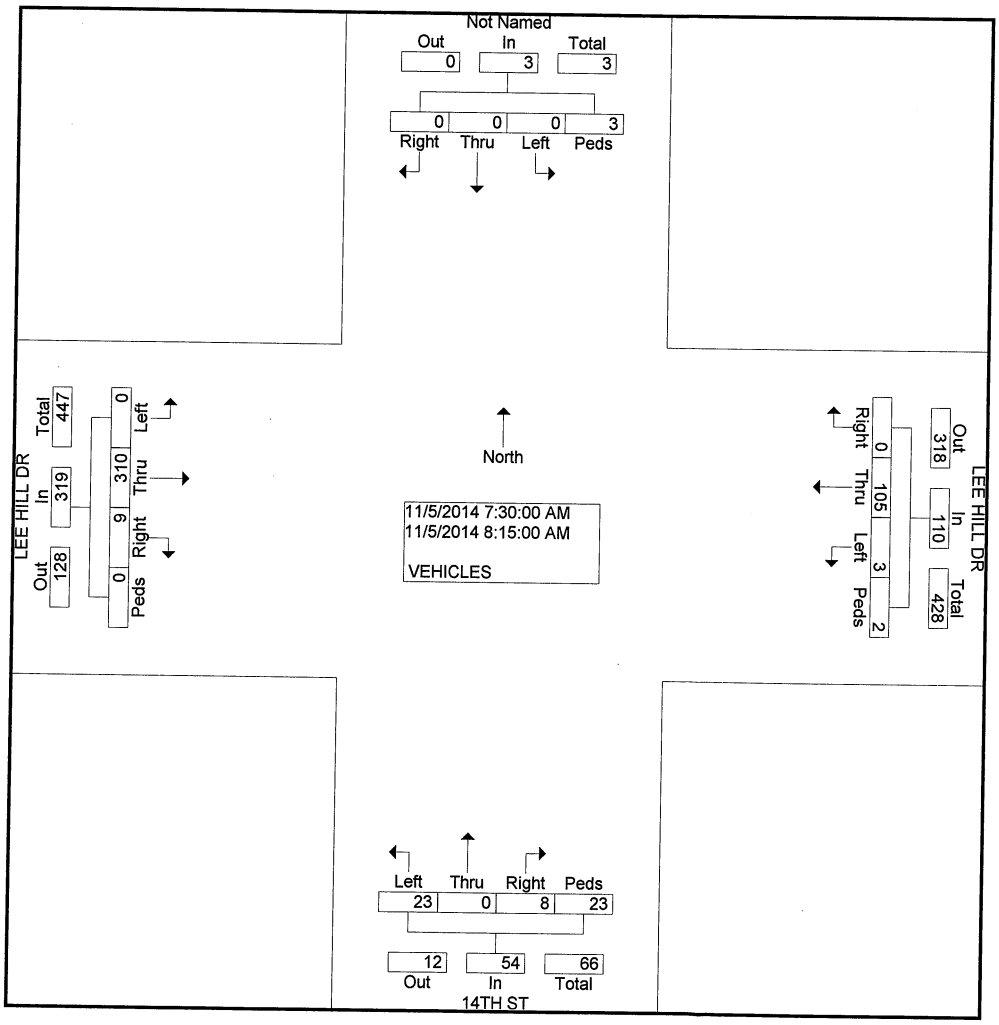
	Southbound				LEE HILL DR Westbound				14TH ST Northbound				LEE HILL DR Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	0	0	1	0	18	0	0	1	0	2	2	0	46	0	0	70
07:15 AM	0	0	0	1	4	20	0	0	5	0	3	2	0	53	3	0	91
07:30 AM	0	0	0	0	1	17	0	0	3	0	3	4	0	69	0	0	97
07:45 AM	0	0	0	2	0	35	0	1	4	0	1	9	0	76	1	0	129
Total	0	0	0	4	5	90	0	1	13	0	9	17	0	244	4	0	387
08:00 AM	0	0	0	0	1	30	0	0	8	0	3	3	0	83	1	0	129
08:15 AM	0	0	0	1	1	23	0	1	8	0	1	7	0	82	7	0	131
08:30 AM	0	0	0	1	1	31	0	0	1	0	3	3	0	66	2	0	108
08:45 AM	0	0	0	0	1	28	0	0	3	0	5	2	0	53	1	0	93
Total	0	0	0	2	4	112	0	1	20	0	12	15	0	284	11	0	461
04:00 PM	0	0	0	1	1	50	0	0	3	0	3	4	0	58	1	0	121
04:15 PM	0	0	0	0	1	39	0	0	4	0	5	5	0	37	2	0	93
04:30 PM	0	0	0	1	4	53	0	0	11	0	5	3	0	47	8	0	132
04:45 PM	0	0	0	1	3	54	0	1	6	0	2	5	0	64	0	0	136
Total	0	0	0	3	9	196	0	1	24	0	15	17	0	206	11	0	482
05:00 PM	0	0	0	0	4	47	0	0	8	0	3	1	0	44	3	0	110
05:15 PM	0	0	0	2	4	47	0	0	5	0	8	0	0	48	1	0	115
05:30 PM	0	0	0	1	4	60	0	0	7	0	3	2	0	48	2	0	127
05:45 PM	0	0	0	0	5	69	0	0	2	0	2	1	0	53	2	0	134
Total	0	0	0	3	17	223	0	0	22	0	16	4	0	193	8	0	486
Grand Total	0	0	0	12	35	621	0	3	79	0	52	53	0	927	34	0	1816
Apprch %	0.0	0.0	0.0	100.0	5.3	94.2	0.0	0.5	42.9	0.0	28.3	28.8	0.0	96.5	3.5	0.0	
Total %	0.0	0.0	0.0	0.7	1.9	34.2	0.0	0.2	4.4	0.0	2.9	2.9	0.0	51.0	1.9	0.0	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 14TH ST
E/W STREET: LEE HILL DR
CITY: BOULDER
COUNTY: BOULDER

File Name : 14THLEEH
Site Code : 00000005
Start Date : 11/5/2014
Page No : 2

	Southbound					LEE HILL DR Westbound					14TH ST Northbound					LEE HILL DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	07:30 AM																				
Volume	0	0	0	3	3	3	105	0	2	110	23	0	8	23	54	0	310	9	0	319	486
Percent	0.0	0.0	0.0	100.0		2.7	95.5	0.0	1.8		42.6	0.0	14.8	42.6		0.0	97.2	2.8	0.0		
08:15 Volume	0	0	0	1	1	1	23	0	1	25	8	0	1	7	16	0	82	7	0	89	131
Peak Factor																					0.927
High Int.	07:45 AM					07:45 AM					08:15 AM					08:15 AM					
Volume	0	0	0	2	2	0	35	0	1	36	8	0	1	7	16	0	82	7	0	89	
Peak Factor					0.375					0.764					0.844					0.896	

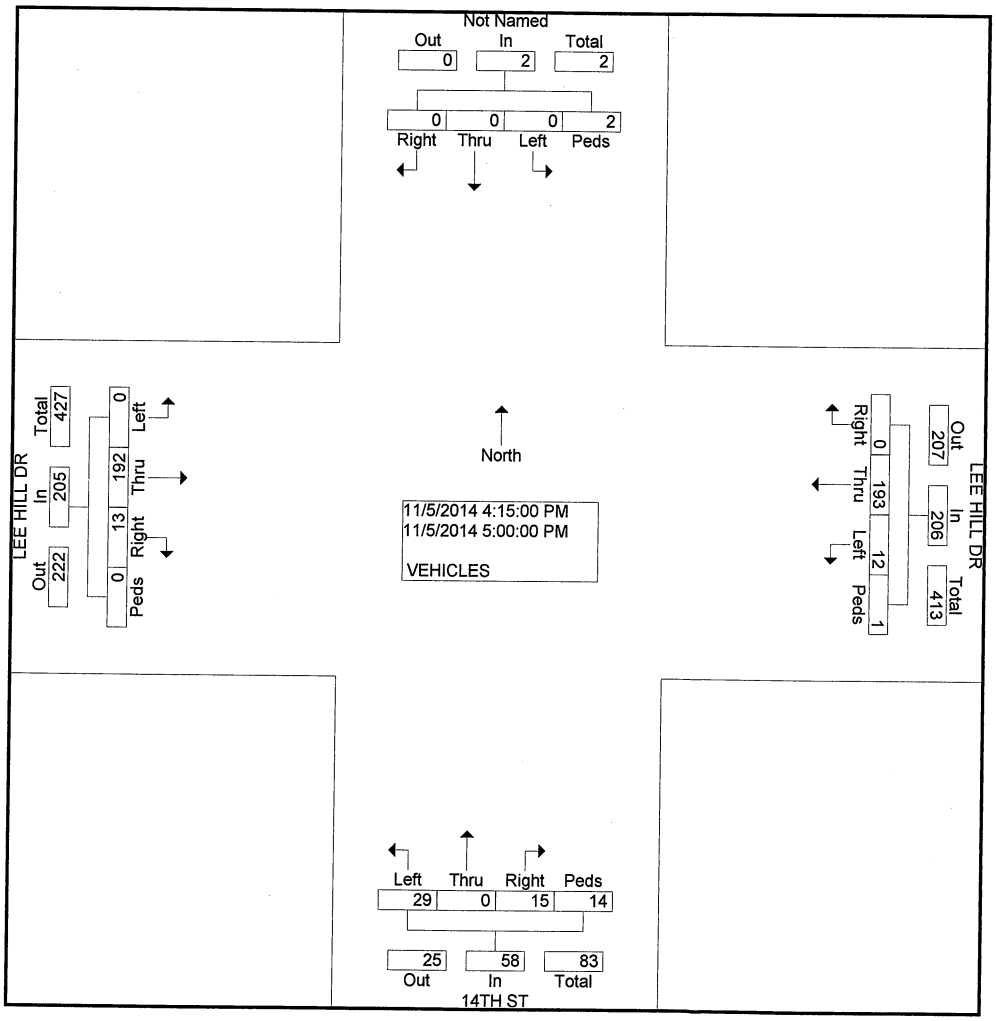


COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 14TH ST
E/W STREET: LEE HILL DR
CITY: BOULDER
COUNTY: BOULDER

File Name : 14THLEEH
Site Code : 00000005
Start Date : 11/5/2014
Page No : 2

	Southbound					LEE HILL DR Westbound					14TH ST Northbound					LEE HILL DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	0	0	0	2	2	12	193	0	1	206	29	0	15	14	58	0	192	13	0	205	471
Percent	0.0	0.0	0.0	100.0		5.8	93.7	0.0	0.5		50.0	0.0	25.9	24.1		0.0	93.7	6.3	0.0		
04:45 Volume	0	0	0	1	1	3	54	0	1	58	6	0	2	5	13	0	64	0	0	64	136
Peak Factor																					0.866
High Int.	04:30 PM					04:45 PM					04:30 PM					04:45 PM					
Volume	0	0	0	1	1	3	54	0	1	58	11	0	5	3	19	0	64	0	0	64	
Peak Factor					0.500					0.888					0.763					0.801	



COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 14TH ST
E/W STREET: YARMOUTH AVE
CITY: BOULDER
COUNTY: BOULDER

File Name : 14THYARM
Site Code : 00000005
Start Date : 11/12/2014
Page No : 1

Groups Printed- 1 - VEHICLES

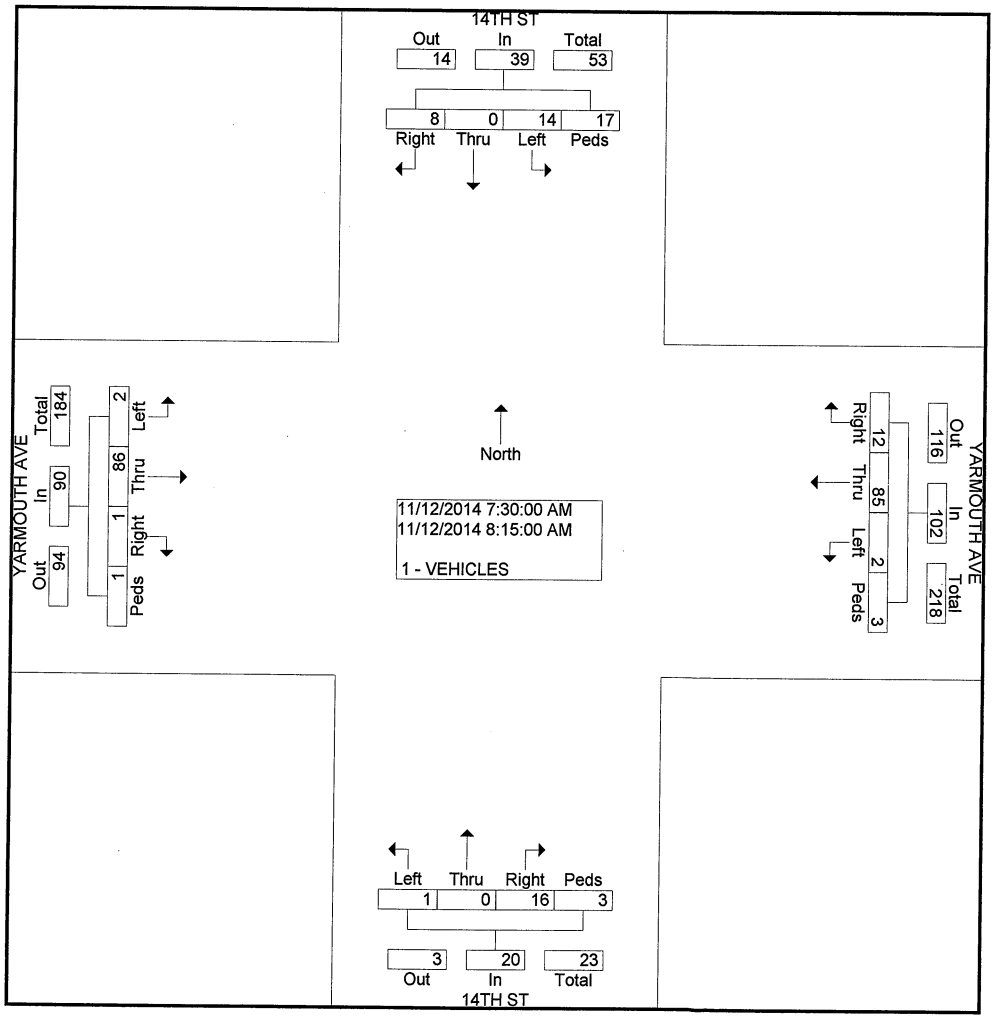
	14TH ST Southbound				YARMOUTH AVE Westbound				14TH ST Northbound				YARMOUTH AVE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	3	0	0	0	0	12	1	0	0	0	3	0	1	7	0	0	27
07:15 AM	2	0	2	1	1	15	3	0	0	0	0	0	2	10	0	0	36
07:30 AM	5	0	1	3	1	15	3	0	0	0	5	1	2	11	0	1	48
07:45 AM	1	0	1	5	0	25	5	0	1	0	5	0	0	21	1	0	65
Total	11	0	4	9	2	67	12	0	1	0	13	1	5	49	1	1	176
08:00 AM	4	0	5	5	1	28	2	2	0	0	3	2	0	21	0	0	73
08:15 AM	4	0	1	4	0	17	2	1	0	0	3	0	0	33	0	0	65
08:30 AM	3	0	2	1	2	18	0	2	0	0	6	2	2	28	1	1	68
08:45 AM	5	0	5	2	1	22	7	0	0	0	2	0	2	29	0	0	75
Total	16	0	13	12	4	85	11	5	0	0	14	4	4	111	1	1	281
04:00 PM	6	0	3	5	3	40	9	2	0	0	4	1	2	46	3	0	124
04:15 PM	3	0	4	6	4	38	2	0	1	0	1	2	3	35	1	0	100
04:30 PM	8	2	8	1	3	38	3	0	0	0	2	4	0	24	0	0	93
04:45 PM	9	0	3	12	4	41	5	1	0	0	3	1	2	42	1	0	124
Total	26	2	18	24	14	157	19	3	1	0	10	8	7	147	5	0	441
05:00 PM	11	0	2	3	3	26	8	0	0	0	6	1	2	34	0	0	96
05:15 PM	6	0	3	3	3	21	5	0	0	0	3	2	3	25	0	0	74
05:30 PM	6	0	1	2	6	40	3	2	0	0	4	0	3	20	0	0	87
05:45 PM	2	0	0	4	7	23	3	0	1	0	0	0	4	21	0	0	65
Total	25	0	6	12	19	110	19	2	1	0	13	3	12	100	0	0	322
Grand Total	78	2	41	57	39	419	61	10	3	0	50	16	28	407	7	2	1220
Apprch %	43.8	1.1	23.0	32.0	7.4	79.2	11.5	1.9	4.3	0.0	72.5	23.2	6.3	91.7	1.6	0.5	
Total %	6.4	0.2	3.4	4.7	3.2	34.3	5.0	0.8	0.2	0.0	4.1	1.3	2.3	33.4	0.6	0.2	

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 14TH ST
E/W STREET: YARMOUTH AVE
CITY: BOULDER
COUNTY: BOULDER

File Name : 14THYARM
Site Code : 00000005
Start Date : 11/12/2014
Page No : 2

	14TH ST Southbound					YARMOUTH AVE Westbound					14TH ST Northbound					YARMOUTH AVE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	07:30 AM																				
Volume	14	0	8	17	39	2	85	12	3	102	1	0	16	3	20	2	86	1	1	90	251
Percent	35.9	0.0	20.5	43.6		2.0	83.3	11.8	2.9		5.0	0.0	80.0	15.0		2.2	95.6	1.1	1.1		
08:00 Volume	4	0	5	5	14	1	28	2	2	33	0	0	3	2	5	0	21	0	0	21	73
Peak Factor																					0.860
High Int.	08:00 AM					08:00 AM					07:30 AM					08:15 AM					
Volume	4	0	5	5	14	1	28	2	2	33	0	0	5	1	6	0	33	0	0	33	
Peak Factor					0.696					0.773					0.833					0.682	

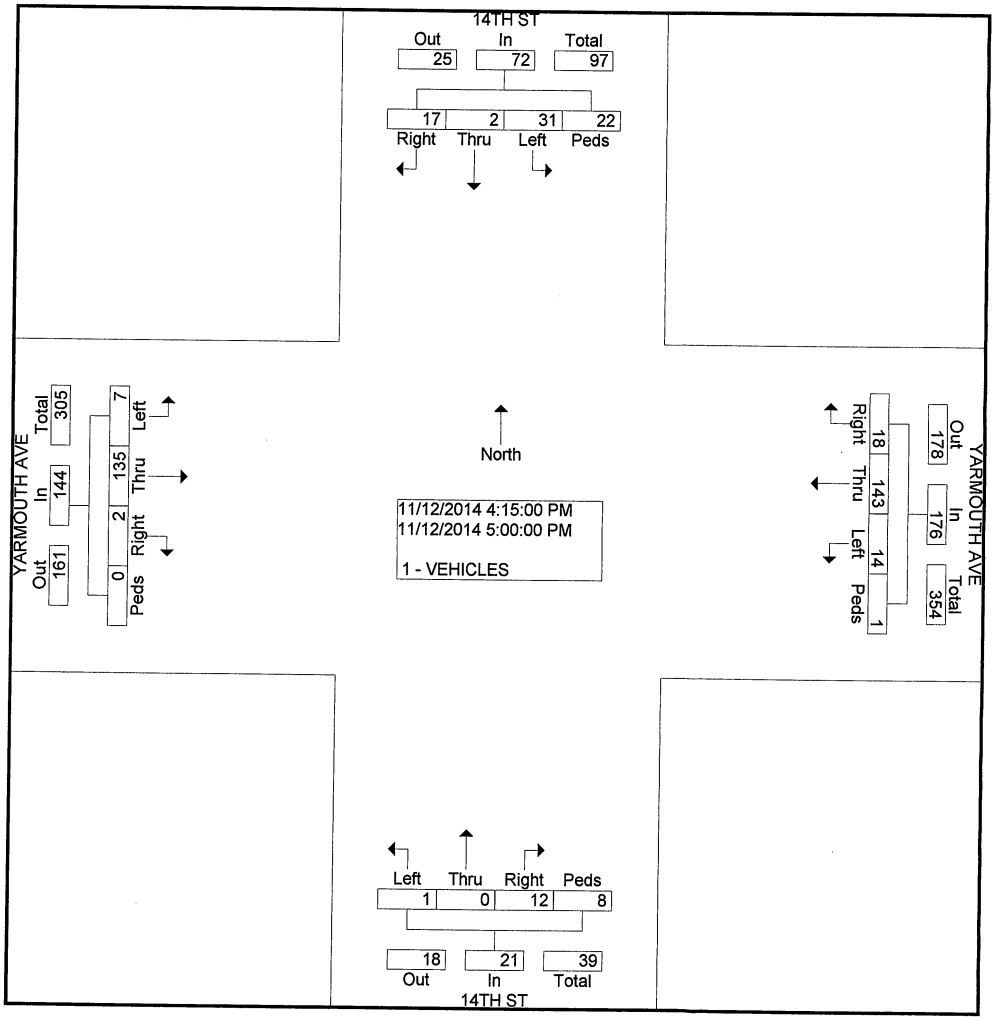


COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

N/S STREET: 14TH ST
E/W STREET: YARMOUTH AVE
CITY: BOULDER
COUNTY: BOULDER

File Name : 14THYARM
Site Code : 00000005
Start Date : 11/12/2014
Page No : 2

	14TH ST Southbound					YARMOUTH AVE Westbound					14TH ST Northbound					YARMOUTH AVE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	31	2	17	22	72	14	143	18	1	176	1	0	12	8	21	7	135	2	0	144	413
Percent	43.1	2.8	23.6	30.6		8.0	81.3	10.2	0.6		4.8	0.0	57.1	38.1		4.9	93.8	1.4	0.0		
04:45 Volume	9	0	3	12	24	4	41	5	1	51	0	0	3	1	4	2	42	1	0	45	124
Peak Factor																					0.833
High Int.	04:45 PM					04:45 PM					05:00 PM					04:45 PM					
Volume	9	0	3	12	24	4	41	5	1	51	0	0	6	1	7	2	42	1	0	45	
Peak Factor					0.750					0.863					0.750					0.800	



Location: 14TH ST S/O LEE HILL DR
City: BOULDER
County: BOULDER
Direction: NORTHBOUND-SOUTHBOUND

COUNTER MEASURES, INC
1889 YORK STREET
DENVER, CO 80206
303-333-1105

Site Code: 111714

Start Time	17-Nov-14 NB	17-Nov-14 SB	Tue NB	Tue SB	Wed NB	Wed SB	Thu NB	Thu SB	Fri NB	Fri SB	Sat NB	Sat SB	Sun NB	Sun SB	Week Average NB	Week Average SB
12:00 AM	*	*	0	0	0	0	1	1	*	*	*	*	*	*	0	0
01:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	0	1	3	3	0	0	*	*	*	*	*	*	1	1
04:00	*	*	0	1	1	2	0	1	*	*	*	*	*	*	0	1
05:00	*	*	0	1	1	2	2	3	*	*	*	*	*	*	1	2
06:00	*	*	13	12	7	5	8	11	*	*	*	*	*	*	9	9
07:00	*	*	24	31	38	36	**30**	29	*	*	*	*	*	*	31	32
08:00	*	*	**32**	32	**40**	**38**	24	30	*	*	*	*	*	*	**32**	**33**
09:00	*	*	24	**34**	29	34	24	30	*	*	*	*	*	*	26	33
10:00	*	*	30	32	22	22	14	23	*	*	*	*	*	*	22	26
11:00	*	*	28	30	26	24	26	**31**	*	*	*	*	*	*	27	28
12:00 PM	*	*	32	34	24	22	27	26	*	*	*	*	*	*	28	27
01:00	*	*	20	25	29	34	18	19	*	*	*	*	*	*	22	26
02:00	*	*	26	24	24	28	29	31	*	*	*	*	*	*	26	28
03:00	*	*	39	36	30	32	26	28	*	*	*	*	*	*	32	32
04:00	*	*	36	38	28	28	**40**	**42**	*	*	*	*	*	*	35	36
05:00	*	*	**42**	**46**	**44**	**48**	34	34	*	*	*	*	*	*	**40**	**43**
06:00	*	*	22	20	24	24	30	28	*	*	*	*	*	*	25	24
07:00	*	*	9	10	13	21	14	13	*	*	*	*	*	*	12	15
08:00	*	*	11	13	9	11	10	8	*	*	*	*	*	*	10	11
09:00	*	*	5	6	4	8	11	14	*	*	*	*	*	*	7	9
10:00	*	*	2	3	2	5	4	4	*	*	*	*	*	*	3	4
11:00	*	*	0	0	2	3	1	1	*	*	*	*	*	*	1	1
Lane	0	0	395	429	400	430	373	407	0	0	0	0	0	0	390	421
Day	0		824		830		780		0		0		0		811	
AM Peak	-	-	08:00	09:00	08:00	08:00	07:00	11:00	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	32	34	40	38	30	31	-	-	-	-	-	-	32	33
PM Peak	-	-	17:00	17:00	17:00	17:00	16:00	16:00	-	-	-	-	-	-	17:00	17:00
Vol.	-	-	42	46	44	48	40	42	-	-	-	-	-	-	40	43

Comb. Total	0	824	830	780	0	0	0	811

ADT ADT 811 AADT 811

Site Code: 111705

Location: 14TH ST N/O YARMOUTH AVE
City: BOULDER
County: BOULDER
Direction: NORTHBOUND-SOUTHBOUND

COUNTER MEASURES, INC
1889 YORK STREET
DENVER, CO 80206
303-333-1105

Start	17-Nov-14		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	0	0	0	0	1	1	*	*	*	*	*	*	0	0
01:00	*	*	2	1	0	0	2	2	*	*	*	*	*	*	1	1
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
04:00	*	*	4	4	3	3	2	2	*	*	*	*	*	*	3	3
05:00	*	*	6	7	2	2	5	5	*	*	*	*	*	*	4	5
06:00	*	*	14	12	11	14	12	12	*	*	*	*	*	*	12	13
07:00	*	*	56	57	64	67	52	50	*	*	*	*	*	*	57	58
08:00	*	*	**70**	**63**	**66**	**70**	**74**	72	*	*	*	*	*	*	**70**	**68**
09:00	*	*	49	44	56	58	54	45	*	*	*	*	*	*	53	49
10:00	*	*	60	62	46	50	66	**74**	*	*	*	*	*	*	57	62
11:00	*	*	52	53	54	60	56	65	*	*	*	*	*	*	54	59
12:00 PM	*	*	59	64	56	59	66	66	*	*	*	*	*	*	60	63
01:00	*	*	52	62	61	64	66	66	*	*	*	*	*	*	60	64
02:00	*	*	47	56	58	67	60	58	*	*	*	*	*	*	55	60
03:00	*	*	**72**	78	61	72	55	53	*	*	*	*	*	*	63	68
04:00	*	*	57	66	60	74	**84**	**95**	*	*	*	*	*	*	67	78
05:00	*	*	72	**84**	**86**	**99**	68	68	*	*	*	*	*	*	**75**	**84**
06:00	*	*	54	60	42	48	38	40	*	*	*	*	*	*	45	49
07:00	*	*	34	39	41	44	28	28	*	*	*	*	*	*	34	37
08:00	*	*	19	18	23	24	20	21	*	*	*	*	*	*	21	21
09:00	*	*	20	22	26	24	20	22	*	*	*	*	*	*	22	23
10:00	*	*	3	3	10	10	4	5	*	*	*	*	*	*	6	6
11:00	*	*	5	4	8	8	4	4	*	*	*	*	*	*	6	5
Lane	0	0	807	859	834	917	837	854	0	0	0	0	0	0	825	876
Day	0		1666		1751		1691		0		0		0		1701	
AM Peak	-	-	08:00	08:00	08:00	08:00	08:00	10:00	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	70	63	66	70	74	74	-	-	-	-	-	-	70	68
PM Peak	-	-	15:00	17:00	17:00	17:00	16:00	16:00	-	-	-	-	-	-	17:00	17:00
Vol.	-	-	72	84	86	99	84	95	-	-	-	-	-	-	75	84

Comb. Total	0	1666	1751	1691	0	0	0	1701

ADT ADT 1,703 AADT 1,703

Site Code: 111712

Location: YELLOW PINE DR E/O BROADWAY ST
City: BOULDER
County: BOULDER
Direction: LARIMER

COUNTER MEASURES, INC
1889 YORK STREET
DENVER, CO 80206
303-333-1105

Start	17-Nov-14		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	2	0	0	0	2	0	*	*	*	*	*	*	1	0
01:00	*	*	2	2	0	0	1	0	*	*	*	*	*	*	1	1
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
04:00	*	*	2	2	2	4	7	4	*	*	*	*	*	*	4	3
05:00	*	*	4	2	6	6	8	8	*	*	*	*	*	*	6	5
06:00	*	*	11	10	16	16	6	10	*	*	*	*	*	*	11	12
07:00	*	*	36	24	30	34	24	21	*	*	*	*	*	*	30	26
08:00	*	*	37	33	51	46	**65**	**59**	*	*	*	*	*	*	51	46
09:00	*	*	**68**	55	**60**	**56**	59	58	*	*	*	*	*	*	**62**	**56**
10:00	*	*	56	**62**	54	50	62	55	*	*	*	*	*	*	57	56
11:00	*	*	28	32	54	56	34	26	*	*	*	*	*	*	39	38
12:00 PM	*	*	49	51	56	62	44	39	*	*	*	*	*	*	50	51
01:00	*	*	**50**	**56**	52	50	45	32	*	*	*	*	*	*	49	46
02:00	*	*	42	44	31	32	40	40	*	*	*	*	*	*	38	39
03:00	*	*	45	48	38	42	48	52	*	*	*	*	*	*	44	47
04:00	*	*	48	45	44	47	42	50	*	*	*	*	*	*	45	47
05:00	*	*	48	49	**71**	**74**	**63**	**66**	*	*	*	*	*	*	**61**	**63**
06:00	*	*	44	44	42	30	58	55	*	*	*	*	*	*	48	43
07:00	*	*	27	24	28	20	36	37	*	*	*	*	*	*	30	27
08:00	*	*	20	17	20	14	20	22	*	*	*	*	*	*	20	18
09:00	*	*	12	9	16	10	16	17	*	*	*	*	*	*	15	12
10:00	*	*	4	2	2	1	14	11	*	*	*	*	*	*	7	5
11:00	*	*	0	0	2	2	1	1	*	*	*	*	*	*	1	1
Lane	0	0	635	611	675	652	695	663	0	0	0	0	0	0	670	642
Day	0		1246		1327		1358		0		0		0		1312	
AM Peak	-	-	09:00	10:00	09:00	09:00	08:00	08:00	-	-	-	-	-	-	09:00	09:00
Vol.	-	-	68	62	60	56	65	59	-	-	-	-	-	-	62	56
PM Peak	-	-	13:00	13:00	17:00	17:00	17:00	17:00	-	-	-	-	-	-	17:00	17:00
Vol.	-	-	50	56	71	74	63	66	-	-	-	-	-	-	61	63

Comb. Total	0	1246	1327	1358	0	0	0	1312

ADT ADT 1,310 AADT 1,310

Station No. 2405 - U.S. 36 north of Broadway Linear Regression Analysis

Year	Field	Regression
1982	7,458	9,049
1983	6,610	9,172
1984	9,450	9,294
1985	8,976	9,416
1986	8,390	9,539
1987	11,081	9,661
1988	9,759	9,783
1989	12,042	9,906
1990	9,267	10,028
1991	9,858	10,151
1992	9,934	10,273
1993	10,896	10,395
1994	11,105	10,518
1995	10,519	10,640
1996	11,508	10,762
1997	12,093	10,885
1998	11,728	11,007
1999	11,048	11,129
2000	12,471	11,252
2001	12,717	11,374
2002	11,307	11,496
2003	12,486	11,619
2004	12,172	11,741
2005	11,688	11,863
2006	12,273	11,986
2007	12,094	12,108
2008	14,112	12,230
2009	12,836	12,353
2010	11,351	12,475
2011	11,058	12,597
2012	11,519	12,720
2013	12,449	12,842
2014	10,160	12,965
2015	13,903	13,087
2035		15,534

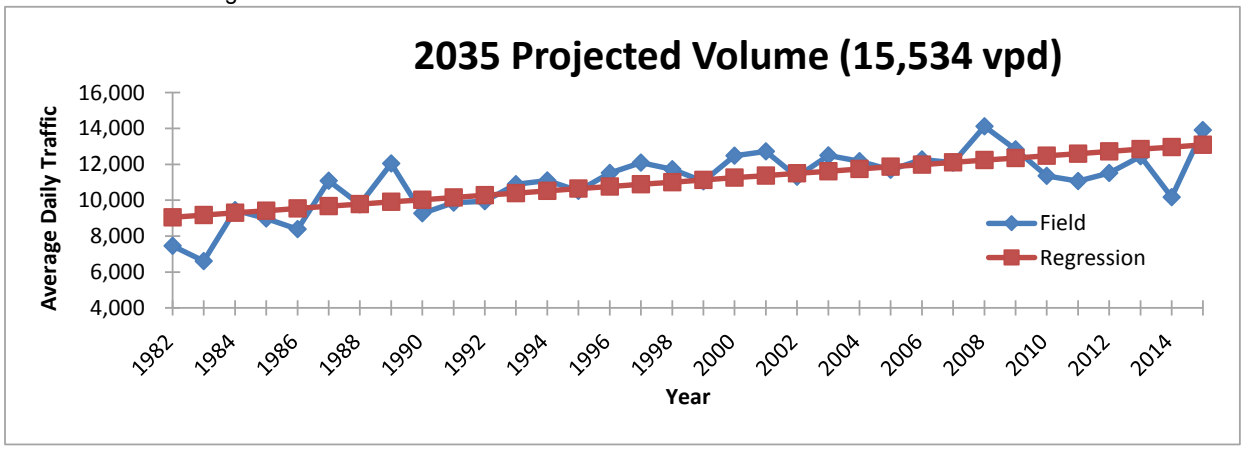
Regression Statistics	
Multiple R	0.729505891
R Square	0.532178844
Adjusted R Square	0.517559433
Standard Error	1160.033395
Observations	34

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	5E+07	48985631.48	36.402208	9.85381E-07
Residual	32	4E+07	1345677.478		
Total	33	9E+07			

	Coefficients	*andard Er*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Upper 95.0%*
Intercept	-233443.015	40527	-5.76024338	2.1753E-06	-315992.9743	-150893	-315993	-150893
X Variable 1	122.3473389	20.278	6.033424236	9.8538E-07	81.04187734	163.653	81.0419	163.653

Linear Regression Growth Rate: **1.1%**



Station No. 2414 - Lee Hill Road West of 4th Linear Regression Analysis

Year	Field	Regression
1993	5,161	5,122
1994	4,993	5,068
1995	4,634	5,014
1996	4,839	4,960
1997	4,784	4,906
1998	4,816	4,852
1999	4,833	4,798
2000	4,857	4,744
2001	4,895	4,691
2002	4,767	4,637
2003	4,522	4,583
2004	4,653	4,529
2005	4,629	4,475
2006	4,834	4,421
2007	4,663	4,367
2008	4,533	4,313
2009	4,195	4,260
2010	3,847	4,206
2011	4,021	4,152
2012	4,090	4,098
2013	3,970	4,044
2014	3,830	3,990
2014	3,854	3,990
2035		2,859

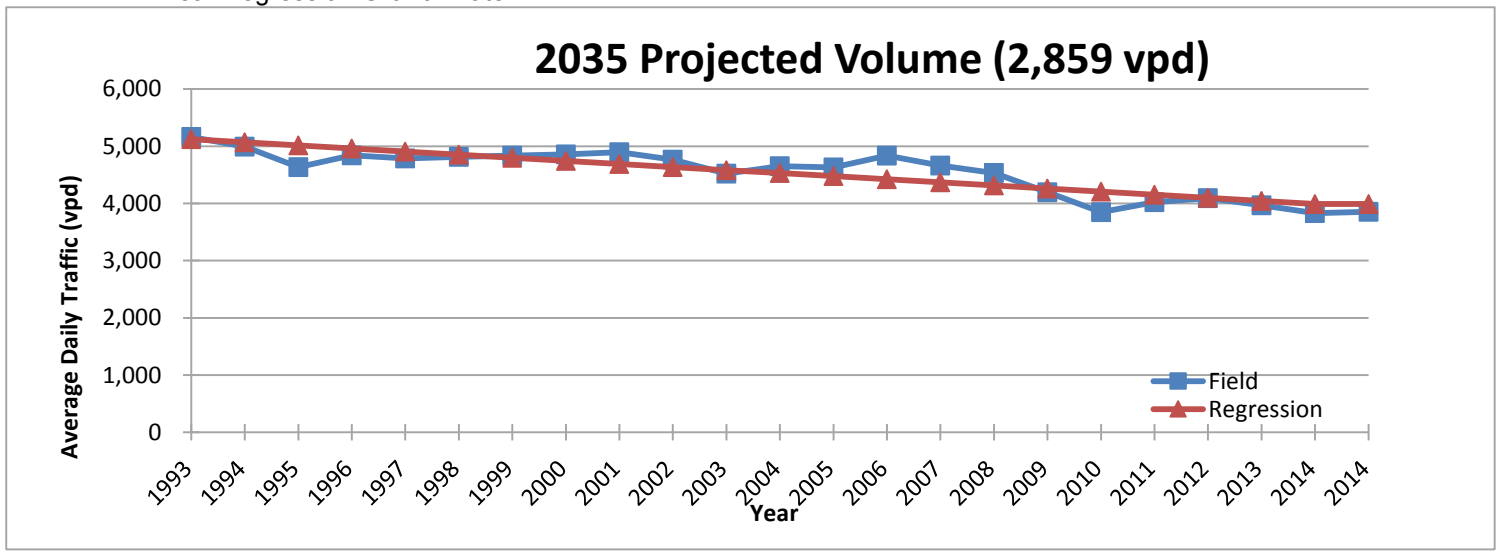
Regression Statistics	
Multiple R	0.8842092
R Square	0.7818259
Adjusted R Square	0.7714366
Standard Error	195.51786
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2876729	2876729	75.2534	2.19487E-08
Residual	21	802772	38227.2		
Total	22	3679501			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	112503.09	12446.6	9.03888	1.1E-08	86619.03008	138387	86619	138387
X Variable 1	-53.879329	6.21097	-8.67487	2.2E-08	-66.79573931	-40.9629	-66.7957	-40.9629

Linear Regression Growth Rate: **-1.2%**



Station No. 6 - Broadway South of Iris Linear Regression Analysis

Year	Field	Regression
1983	20,255	22,264
1984	20,705	22,407
1985	21,580	22,551
1986	22,096	22,694
1987	20,508	22,837
1988	22,438	22,980
1989	23,121	23,124
1990	18,695	23,267
1991	21,700	23,410
1992	23,908	23,553
1993	22,422	23,697
1994	25,040	23,840
1995	25,392	23,983
1996	25,963	24,126
1997	27,104	24,269
1998	27,662	24,413
1999	26,038	24,556
2000	27,152	24,699
2001	28,421	24,842
2002	28,465	24,986
2003	26,173	25,129
2004	28,005	25,272
2005	30,190	25,415
2006	27,546	25,559
2007	27,401	25,702
2008	25,676	25,845
2009	24,146	25,988
2010	23,023	26,132
2011	23,937	26,275
2012	23,952	26,418
2013	23,508	26,561
2014	23,867	26,705
2015	24,260	26,848
2035		29,712

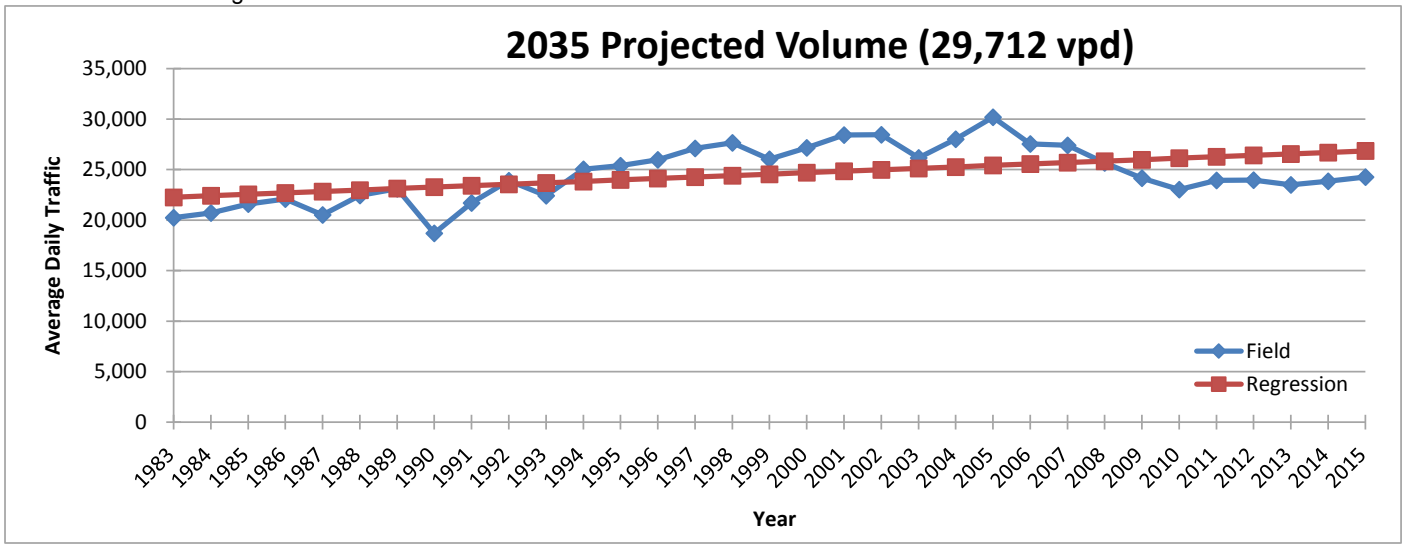
Regression Statistics	
Multiple R	0.49918605
R Square	0.24918672
Adjusted R Square	0.22496693
Standard Error	2442.61371
Observations	33

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	61385275.74	61385275.74	10.2885609	0.003103095
Residual	31	184957213.6	5966361.729		
Total	32	246342489.3			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*.ower 95.0%*	*Jpper 95.0%*
Intercept	-261772.223	89267.15968	-2.9324583	0.00627131	-443833.7959	-79710.7	-443834	-79710.7
X Variable 1	143.235712	44.65540119	3.207578659	0.00310309	52.16042071	234.311	52.16042	234.311

Linear Regression Growth Rate: **0.59%**



Intersection Capacity Worksheets: 2016 Existing

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	238	180	41	71	9	100	193	32	42	518	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.89	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.99	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.98		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1860	1408	1735	1825		1746	1809		1757	1849	
Flt Permitted		0.99	1.00	0.29	1.00		0.35	1.00		0.59	1.00	
Satd. Flow (perm)		1848	1408	531	1825		641	1809		1086	1849	
Peak-hour factor, PHF	0.81	0.81	0.81	0.96	0.96	0.96	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	9	294	222	43	74	9	118	227	38	49	609	19
RTOR Reduction (vph)	0	0	172	0	5	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	303	50	43	78	0	118	260	0	49	627	0
Confl. Peds. (#/hr)	3		15	15		3	16		3	3		16
Confl. Bikes (#/hr)			30			6			40			25
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		19.2	19.2	19.2	19.2		61.1	61.1		60.1	60.1	
Effective Green, g (s)		20.4	20.4	20.4	20.4		61.6	61.6		61.6	61.6	
Actuated g/C Ratio		0.23	0.23	0.23	0.23		0.68	0.68		0.68	0.68	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		418	319	120	413		438	1238		743	1265	
v/s Ratio Prot					0.04			0.14			c0.34	
v/s Ratio Perm		c0.16	0.04	0.08			0.18			0.05		
v/c Ratio		0.72	0.16	0.36	0.19		0.27	0.21		0.07	0.50	
Uniform Delay, d1		32.2	27.9	29.3	28.1		5.5	5.2		4.7	6.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.2	0.1	0.7	0.1		1.5	0.4		0.2	1.4	
Delay (s)		37.4	28.0	30.0	28.2		7.0	5.6		4.9	8.2	
Level of Service		D	C	C	C		A	A		A	A	
Approach Delay (s)		33.4			28.8			6.0			7.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	6	348	19	14	777
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.84	0.84	0.96	0.96
Hourly flow rate (vph)	17	7	414	23	15	809
Pedestrians	30		4			7
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	3		0			1
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	0.85					
vC, conflicting volume	1298	463			467	
vC1, stage 1 conf vol	456					
vC2, stage 2 conf vol	843					
vCu, unblocked vol	1262	463			467	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			99	
cM capacity (veh/h)	353	581			1067	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	24	437	15	809
Volume Left	17	0	15	0
Volume Right	7	23	0	0
cSH	400	1700	1067	1700
Volume to Capacity	0.06	0.26	0.01	0.48
Queue Length 95th (ft)	5	0	1	0
Control Delay (s)	14.6	0.0	8.4	0.0
Lane LOS	B		A	
Approach Delay (s)	14.6	0.0	0.1	
Approach LOS	B			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	66	48	320	17	47	743
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.84	0.84	0.96	0.96
Hourly flow rate (vph)	80	58	381	20	49	774
Pedestrians	4		20			30
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		2			3
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1287	425			405	
vC1, stage 1 conf vol	395					
vC2, stage 2 conf vol	892					
vCu, unblocked vol	1287	425			405	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	91			96	
cM capacity (veh/h)	347	611			1150	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	137	401	49	774
Volume Left	80	0	49	0
Volume Right	58	20	0	0
cSH	599	1700	1150	1700
Volume to Capacity	0.23	0.24	0.04	0.46
Queue Length 95th (ft)	22	0	3	0
Control Delay (s)	15.5	0.0	8.3	0.0
Lane LOS	C		A	
Approach Delay (s)	15.5	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	315	9	3	107	23	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.77	0.77	0.71	0.71
Hourly flow rate (vph)	350	10	4	139	32	11
Pedestrians				2	23	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			383		525	380
vC1, stage 1 conf vol					378	
vC2, stage 2 conf vol					147	
vCu, unblocked vol			208		372	204
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	98
cM capacity (veh/h)			1156		664	708

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	360	143	44
Volume Left	0	4	32
Volume Right	10	0	11
cSH	1700	1156	675
Volume to Capacity	0.21	0.00	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.3	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	87	1	2	86	12	1	0	16	14	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.80	0.80	0.80	0.71	0.71	0.71	0.61	0.61	0.61
Hourly flow rate (vph)	3	130	1	2	108	15	1	0	23	23	0	13
Pedestrians		1			3			3			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	140			134			274	284	137	299	277	133
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140			134			274	284	137	299	277	133
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	96	100	99
cM capacity (veh/h)	1423			1447			656	612	907	617	618	902

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	134	125	24	36
Volume Left	3	2	1	23
Volume Right	1	15	23	13
cSH	1423	1447	887	697
Volume to Capacity	0.00	0.00	0.03	0.05
Queue Length 95th (ft)	0	0	2	4
Control Delay (s)	0.2	0.2	9.2	10.4
Lane LOS	A	A	A	B
Approach Delay (s)	0.2	0.2	9.2	10.4
Approach LOS			A	B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	334	0	0	0	114	172	0	0	508	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.25	0.25	0.25	0.78	0.78	0.78	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	371	0	0	0	146	221	0	0	564	11
Pedestrians					1						1	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						0	
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1078	1078	564	1078	1078	223	564			222		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1078	1078	564	1078	1078	223	564			222		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	29	100	100	100	85			100		
cM capacity (veh/h)	174	187	525	51	187	816	1007			1346		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	377	0	146	221	0	0	564	11
Volume Left	6	0	146	0	0	0	0	0
Volume Right	371	0	0	0	0	0	0	11
cSH	533	1700	1007	1700	1700	1700	1700	1700
Volume to Capacity	0.71	0.00	0.15	0.13	0.00	0.00	0.33	0.01
Queue Length 95th (ft)	141	0	13	0	0	0	0	0
Control Delay (s)	26.7	0.0	9.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	A	A					
Approach Delay (s)	26.7	0.0	3.7			0.0		
Approach LOS	D	A						

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	100	131	30	185	26	209	481	50	69	248	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.94	1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.98	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1845	1492	1737	1810		1738	1826		1754	1827	
Flt Permitted		0.80	1.00	0.62	1.00		0.54	1.00		0.39	1.00	
Satd. Flow (perm)		1494	1492	1137	1810		996	1826		723	1827	
Peak-hour factor, PHF	0.98	0.98	0.98	0.81	0.81	0.81	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	17	102	134	37	228	32	227	523	54	83	299	31
RTOR Reduction (vph)	0	0	108	0	6	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	119	26	37	254	0	227	574	0	83	327	0
Confl. Peds. (#/hr)	10		7	7		10	8		8	8		8
Confl. Bikes (#/hr)			8			17			23			9
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		18.4	18.4	18.4	18.4		71.9	71.9		70.9	70.9	
Effective Green, g (s)		19.6	19.6	19.6	19.6		72.4	72.4		72.4	72.4	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.72	0.72		0.72	0.72	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		292	292	222	354		721	1322		523	1322	
v/s Ratio Prot					c0.14			c0.31			0.18	
v/s Ratio Perm		0.08	0.02	0.03			0.23			0.11		
v/c Ratio		0.41	0.09	0.17	0.72		0.31	0.43		0.16	0.25	
Uniform Delay, d1		35.1	32.9	33.4	37.6		4.9	5.6		4.3	4.6	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3	0.0	0.1	5.7		1.1	1.0		0.6	0.4	
Delay (s)		35.5	32.9	33.5	43.3		6.1	6.6		5.0	5.1	
Level of Service		D	C	C	D		A	A		A	A	
Approach Delay (s)		34.1			42.1			6.5			5.1	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	12	734	20	10	423
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	14	14	765	21	11	470
Pedestrians	38					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	0.99					
vC, conflicting volume	1305	816			823	
vC1, stage 1 conf vol	813					
vC2, stage 2 conf vol	492					
vCu, unblocked vol	1304	816			823	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	96			99	
cM capacity (veh/h)	369	364			781	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	28	785	11	470
Volume Left	14	0	11	0
Volume Right	14	21	0	0
cSH	366	1700	781	1700
Volume to Capacity	0.08	0.46	0.01	0.28
Queue Length 95th (ft)	6	0	1	0
Control Delay (s)	15.6	0.0	9.7	0.0
Lane LOS	C		A	
Approach Delay (s)	15.6	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	69	62	693	89	57	173
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	80	72	722	93	63	192
Pedestrians	10		20			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		2			0
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1117	783			825	
vC1, stage 1 conf vol	778					
vC2, stage 2 conf vol	339					
vCu, unblocked vol	1117	783			825	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	81			92	
cM capacity (veh/h)	400	389			799	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	152	815	63	192
Volume Left	80	0	63	0
Volume Right	72	93	0	0
cSH	760	1700	799	1700
Volume to Capacity	0.20	0.48	0.08	0.11
Queue Length 95th (ft)	19	0	6	0
Control Delay (s)	16.3	0.0	9.9	0.0
Lane LOS	C		A	
Approach Delay (s)	16.3	0.0	2.5	
Approach LOS	C			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	210	13	12	211	29	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.90	0.90	0.69	0.69
Hourly flow rate (vph)	262	16	13	234	42	22
Pedestrians				1	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			293		546	286
vC1, stage 1 conf vol					285	
vC2, stage 2 conf vol					261	
vCu, unblocked vol			279		535	272
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1254		657	749

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	279	248	64
Volume Left	0	13	42
Volume Right	16	0	22
cSH	1700	1254	686
Volume to Capacity	0.16	0.01	0.09
Queue Length 95th (ft)	0	1	8
Control Delay (s)	0.0	0.5	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.8
Approach LOS			B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	137	2	14	145	18	1	0	12	31	2	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.88	0.88	0.88	0.54	0.54	0.54	0.69	0.69	0.69
Hourly flow rate (vph)	9	171	2	16	165	20	2	0	22	45	3	25
Pedestrians					1			8			22	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	207			182			431	437	182	442	428	197
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207			182			431	437	182	442	428	197
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	97	91	99	97
cM capacity (veh/h)	1339			1384			496	491	855	486	497	829

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	182	201	24	72
Volume Left	9	16	2	45
Volume Right	2	20	22	25
cSH	1339	1384	810	566
Volume to Capacity	0.01	0.01	0.03	0.13
Queue Length 95th (ft)	0	1	2	11
Control Delay (s)	0.4	0.7	9.6	12.3
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	0.7	9.6	12.3
Approach LOS			A	B

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	1	222	0	2	1	222	484	0	0	245	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.25	0.25	0.25	0.86	0.86	0.86	0.95	0.95	0.95
Hourly flow rate (vph)	5	1	255	0	8	4	258	563	0	0	258	8
Pedestrians								1			1	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								0			0	
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1346	1337	259	1339	1337	564	258			563		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1346	1337	259	1339	1337	564	258			563		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	99	67	100	93	99	80			100		
cM capacity (veh/h)	103	123	779	74	123	525	1307			1009		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	261	12	258	563	0	0	258	8
Volume Left	5	0	258	0	0	0	0	0
Volume Right	255	4	0	0	0	0	0	8
cSH	797	165	1307	1700	1700	1700	1700	1700
Volume to Capacity	0.33	0.07	0.20	0.33	0.00	0.00	0.15	0.00
Queue Length 95th (ft)	36	6	18	0	0	0	0	0
Control Delay (s)	12.5	28.5	8.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	D	A					
Approach Delay (s)	12.5	28.5	2.7			0.0		
Approach LOS	B	D						

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Capacity Worksheets: 2018 Background

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	244	187	41	73	9	103	193	32	42	518	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.89	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.99	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.98		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1859	1410	1736	1826		1747	1809		1757	1849	
Flt Permitted		0.99	1.00	0.29	1.00		0.35	1.00		0.59	1.00	
Satd. Flow (perm)		1846	1410	526	1826		636	1809		1084	1849	
Peak-hour factor, PHF	0.81	0.81	0.81	0.96	0.96	0.96	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	10	301	231	43	76	9	121	227	38	49	609	19
RTOR Reduction (vph)	0	0	177	0	5	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	311	54	43	80	0	121	260	0	49	627	0
Confl. Peds. (#/hr)	3		15	15		3	16		3	3		16
Confl. Bikes (#/hr)			30			6			40			25
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		19.8	19.8	19.8	19.8		60.5	60.5		59.5	59.5	
Effective Green, g (s)		21.0	21.0	21.0	21.0		61.0	61.0		61.0	61.0	
Actuated g/C Ratio		0.23	0.23	0.23	0.23		0.68	0.68		0.68	0.68	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		430	329	122	426		431	1226		734	1253	
v/s Ratio Prot					0.04			0.14			c0.34	
v/s Ratio Perm		c0.17	0.04	0.08			0.19			0.05		
v/c Ratio		0.72	0.16	0.35	0.19		0.28	0.21		0.07	0.50	
Uniform Delay, d1		31.8	27.5	28.8	27.7		5.8	5.5		4.9	7.1	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.0	0.1	0.6	0.1		1.6	0.4		0.2	1.4	
Delay (s)		36.9	27.6	29.5	27.7		7.4	5.9		5.1	8.5	
Level of Service		D	C	C	C		A	A		A	A	
Approach Delay (s)		32.9			28.3			6.3			8.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	6	351	19	14	784
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.84	0.84	0.96	0.96
Hourly flow rate (vph)	17	7	418	23	15	817
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	0.84					
vC, conflicting volume	1275	429			440	
vC1, stage 1 conf vol	429					
vC2, stage 2 conf vol	846					
vCu, unblocked vol	1233	429			440	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			99	
cM capacity (veh/h)	359	626			1119	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	24	440	15	817
Volume Left	17	0	15	0
Volume Right	7	23	0	0
cSH	411	1700	1119	1700
Volume to Capacity	0.06	0.26	0.01	0.48
Queue Length 95th (ft)	5	0	1	0
Control Delay (s)	14.3	0.0	8.3	0.0
Lane LOS	B		A	
Approach Delay (s)	14.3	0.0	0.1	
Approach LOS	B			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	66	47	323	17	47	750
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.84	0.84	0.96	0.96
Hourly flow rate (vph)	80	57	385	20	49	781
Pedestrians	4		20			30
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		2			3
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1298	429			409	
vC1, stage 1 conf vol	399					
vC2, stage 2 conf vol	899					
vCu, unblocked vol	1298	429			409	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	91			96	
cM capacity (veh/h)	344	609			1146	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	136	405	49	781
Volume Left	80	0	49	0
Volume Right	57	20	0	0
cSH	589	1700	1146	1700
Volume to Capacity	0.23	0.24	0.04	0.46
Queue Length 95th (ft)	22	0	3	0
Control Delay (s)	15.7	0.0	8.3	0.0
Lane LOS	C		A	
Approach Delay (s)	15.7	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	319	9	3	106	23	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.77	0.77	0.71	0.71
Hourly flow rate (vph)	354	10	4	138	32	11
Pedestrians				2	23	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			387		528	384
vC1, stage 1 conf vol					382	
vC2, stage 2 conf vol					145	
vCu, unblocked vol			209		372	206
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	98
cM capacity (veh/h)			1151		662	705

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	364	142	44
Volume Left	0	4	32
Volume Right	10	0	11
cSH	1700	1151	672
Volume to Capacity	0.21	0.00	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.3	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	87	1	2	86	12	1	0	16	14	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.80	0.80	0.80	0.71	0.71	0.71	0.61	0.61	0.61
Hourly flow rate (vph)	3	130	1	2	108	15	1	0	23	23	0	13
Pedestrians		1			3			3			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	140			134			274	284	137	299	277	133
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140			134			274	284	137	299	277	133
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	96	100	99
cM capacity (veh/h)	1423			1447			656	612	907	617	618	902

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	134	125	24	36
Volume Left	3	2	1	23
Volume Right	1	15	23	13
cSH	1423	1447	887	697
Volume to Capacity	0.00	0.00	0.03	0.05
Queue Length 95th (ft)	0	0	2	4
Control Delay (s)	0.2	0.2	9.2	10.4
Lane LOS	A	A	A	B
Approach Delay (s)	0.2	0.2	9.2	10.4
Approach LOS			A	B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	332	0	0	0	114	169	0	0	503	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.25	0.25	0.25	0.78	0.78	0.78	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	369	0	0	0	146	217	0	0	559	11
Pedestrians					1						1	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						0	
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1069	1069	559	1069	1069	219	559			218		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1069	1069	559	1069	1069	219	559			218		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	30	100	100	100	86			100		
cM capacity (veh/h)	177	189	529	53	189	820	1012			1351		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	374	0	146	217	0	0	559	11
Volume Left	6	0	146	0	0	0	0	0
Volume Right	369	0	0	0	0	0	0	11
cSH	537	1700	1012	1700	1700	1700	1700	1700
Volume to Capacity	0.70	0.00	0.14	0.13	0.00	0.00	0.33	0.01
Queue Length 95th (ft)	136	0	13	0	0	0	0	0
Control Delay (s)	26.1	0.0	9.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	A	A					
Approach Delay (s)	26.1	0.0	3.7			0.0		
Approach LOS	D	A						

Intersection Summary			
Average Delay	8.5		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	105	136	30	192	26	217	481	50	69	248	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.94	1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.98	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1845	1493	1737	1811		1738	1826		1754	1825	
Flt Permitted		0.79	1.00	0.61	1.00		0.54	1.00		0.39	1.00	
Satd. Flow (perm)		1464	1493	1117	1811		992	1826		719	1825	
Peak-hour factor, PHF	0.98	0.98	0.98	0.81	0.81	0.81	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	18	107	139	37	237	32	236	523	54	83	299	33
RTOR Reduction (vph)	0	0	111	0	6	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	125	28	37	263	0	236	574	0	83	329	0
Confl. Peds. (#/hr)	10		7	7		10	8		8	8		8
Confl. Bikes (#/hr)			8			17			23			9
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		18.9	18.9	18.9	18.9		71.4	71.4		70.4	70.4	
Effective Green, g (s)		20.1	20.1	20.1	20.1		71.9	71.9		71.9	71.9	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.72	0.72		0.72	0.72	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		294	300	224	364		713	1312		516	1312	
v/s Ratio Prot					c0.15			c0.31			0.18	
v/s Ratio Perm		0.09	0.02	0.03			0.24			0.12		
v/c Ratio		0.43	0.09	0.17	0.72		0.33	0.44		0.16	0.25	
Uniform Delay, d1		34.9	32.5	33.0	37.4		5.2	5.8		4.5	4.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4	0.0	0.1	5.9		1.2	1.1		0.7	0.5	
Delay (s)		35.3	32.6	33.1	43.3		6.4	6.8		5.1	5.3	
Level of Service		D	C	C	D		A	A		A	A	
Approach Delay (s)		33.9			42.1			6.7			5.2	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	12	742	20	10	428
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	14	14	773	21	11	476
Pedestrians	38					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	0.99					
vC, conflicting volume	1319	824			832	
vC1, stage 1 conf vol	821					
vC2, stage 2 conf vol	498					
vCu, unblocked vol	1318	824			832	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	96			99	
cM capacity (veh/h)	365	360			775	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	28	794	11	476
Volume Left	14	0	11	0
Volume Right	14	21	0	0
cSH	362	1700	775	1700
Volume to Capacity	0.08	0.47	0.01	0.28
Queue Length 95th (ft)	6	0	1	0
Control Delay (s)	15.8	0.0	9.7	0.0
Lane LOS	C		A	
Approach Delay (s)	15.8	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	69	62	701	89	57	384
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	80	72	730	93	63	427
Pedestrians	10		20			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		2			0
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1360	792			833	
vC1, stage 1 conf vol	787					
vC2, stage 2 conf vol	573					
vCu, unblocked vol	1360	792			833	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	81			92	
cM capacity (veh/h)	356	384			793	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	152	823	63	427
Volume Left	80	0	63	0
Volume Right	72	93	0	0
cSH	676	1700	793	1700
Volume to Capacity	0.23	0.48	0.08	0.25
Queue Length 95th (ft)	22	0	6	0
Control Delay (s)	17.3	0.0	9.9	0.0
Lane LOS	C		A	
Approach Delay (s)	17.3	0.0	1.3	
Approach LOS	C			

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	213	209	12	210	29	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.90	0.90	0.69	0.69
Hourly flow rate (vph)	266	261	13	233	42	22
Pedestrians				1	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			542		671	412
vC1, stage 1 conf vol					411	
vC2, stage 2 conf vol					260	
vCu, unblocked vol			527		658	395
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	97
cM capacity (veh/h)			1012		593	636

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	528	247	64
Volume Left	0	13	42
Volume Right	261	0	22
cSH	1700	1012	607
Volume to Capacity	0.31	0.01	0.11
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.6	11.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	11.6
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	136	2	14	144	18	1	0	12	31	2	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.88	0.88	0.88	0.54	0.54	0.54	0.69	0.69	0.69
Hourly flow rate (vph)	9	170	2	16	164	20	2	0	22	45	3	25
Pedestrians					1			8			22	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	206			180			429	435	180	440	426	196
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	206			180			429	435	180	440	426	196
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	97	91	99	97
cM capacity (veh/h)	1340			1386			498	493	856	488	499	830

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	181	200	24	72
Volume Left	9	16	2	45
Volume Right	2	20	22	25
cSH	1340	1386	811	568
Volume to Capacity	0.01	0.01	0.03	0.13
Queue Length 95th (ft)	0	1	2	11
Control Delay (s)	0.4	0.7	9.6	12.3
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	0.7	9.6	12.3
Approach LOS			A	B

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	1	221	0	2	1	221	479	0	0	243	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.25	0.25	0.25	0.86	0.86	0.86	0.95	0.95	0.95
Hourly flow rate (vph)	5	1	254	0	8	4	257	557	0	0	256	8
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		0			0							
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1336	1329	257	1328	1329	558	257			558		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1336	1329	257	1328	1329	558	257			558		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	99	67	100	94	99	80			100		
cM capacity (veh/h)	105	124	781	75	124	529	1307			1012		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	260	12	257	557	0	0	256	8
Volume Left	5	0	257	0	0	0	0	0
Volume Right	254	4	0	0	0	0	0	8
cSH	799	167	1307	1700	1700	1700	1700	1700
Volume to Capacity	0.33	0.07	0.20	0.33	0.00	0.00	0.15	0.00
Queue Length 95th (ft)	35	6	18	0	0	0	0	0
Control Delay (s)	12.4	28.3	8.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	D	A					
Approach Delay (s)	12.4	28.3	2.7			0.0		
Approach LOS	B	D						

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Capacity Worksheets: 2035 Background

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	270	205	45	85	15	125	215	40	50	570	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.89	1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.99	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.98		1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1859	1408	1735	1811		1748	1805		1758	1848	
Flt Permitted		0.99	1.00	0.29	1.00		0.34	1.00		0.58	1.00	
Satd. Flow (perm)		1842	1408	532	1811		626	1805		1069	1848	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	293	223	49	92	16	136	234	43	54	620	22
RTOR Reduction (vph)	0	0	172	0	8	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	304	51	49	100	0	136	272	0	54	641	0
Confl. Peds. (#/hr)	3		15	15		3	16		3	3		16
Confl. Bikes (#/hr)			30			6			40			25
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		19.3	19.3	19.3	19.3		61.0	61.0		60.0	60.0	
Effective Green, g (s)		20.5	20.5	20.5	20.5		61.5	61.5		61.5	61.5	
Actuated g/C Ratio		0.23	0.23	0.23	0.23		0.68	0.68		0.68	0.68	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		419	320	121	412		427	1233		730	1262	
v/s Ratio Prot					0.05			0.15			c0.35	
v/s Ratio Perm		c0.17	0.04	0.09			0.22			0.05		
v/c Ratio		0.73	0.16	0.40	0.24		0.32	0.22		0.07	0.51	
Uniform Delay, d1		32.1	27.8	29.6	28.4		5.8	5.3		4.8	6.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.2	0.1	0.8	0.1		2.0	0.4		0.2	1.5	
Delay (s)		37.4	27.9	30.4	28.5		7.7	5.7		4.9	8.4	
Level of Service		D	C	C	C		A	A		A	A	
Approach Delay (s)		33.4			29.1			6.4			8.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	15	15	810	25	15	470
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	16	880	27	16	511
Pedestrians	30		4			7
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	3		0			1
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked						
vC, conflicting volume	1472	931			938	
vC1, stage 1 conf vol	924					
vC2, stage 2 conf vol	547					
vCu, unblocked vol	1472	931			938	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	95			98	
cM capacity (veh/h)	328	314			712	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	33	908	16	511
Volume Left	16	0	16	0
Volume Right	16	27	0	0
cSH	320	1700	712	1700
Volume to Capacity	0.10	0.53	0.02	0.30
Queue Length 95th (ft)	8	0	2	0
Control Delay (s)	17.5	0.0	10.2	0.0
Lane LOS	C		B	
Approach Delay (s)	17.5	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	75	55	355	20	55	820
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	60	386	22	60	891
Pedestrians	4		20			30
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		2			3
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1432	431			412	
vC1, stage 1 conf vol	401					
vC2, stage 2 conf vol	1031					
vCu, unblocked vol	1432	431			412	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	90			95	
cM capacity (veh/h)	299	607			1143	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	141	408	60	891
Volume Left	82	0	60	0
Volume Right	60	22	0	0
cSH	518	1700	1143	1700
Volume to Capacity	0.27	0.24	0.05	0.52
Queue Length 95th (ft)	28	0	4	0
Control Delay (s)	17.3	0.0	8.3	0.0
Lane LOS	C		A	
Approach Delay (s)	17.3	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	345	10	5	120	30	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	375	11	5	130	33	11
Pedestrians				2	23	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			409		545	405
vC1, stage 1 conf vol					403	
vC2, stage 2 conf vol					141	
vCu, unblocked vol			228		387	224
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	98
cM capacity (veh/h)			1128		648	685

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	386	136	43
Volume Left	0	5	33
Volume Right	11	0	11
cSH	1700	1128	657
Volume to Capacity	0.23	0.00	0.07
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.4	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	10.9
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	95	0	0	95	15	5	0	20	20	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	103	0	0	103	16	5	0	22	22	0	11
Pedestrians		1			3			3			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	137			106			240	254	109	267	246	129
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	137			106			240	254	109	267	246	129
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	98	97	100	99
cM capacity (veh/h)	1427			1481			692	637	940	648	643	907

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	109	120	27	33
Volume Left	5	0	5	22
Volume Right	0	16	22	11
cSH	1427	1481	877	716
Volume to Capacity	0.00	0.00	0.03	0.05
Queue Length 95th (ft)	0	0	2	4
Control Delay (s)	0.4	0.0	9.2	10.3
Lane LOS	A		A	B
Approach Delay (s)	0.4	0.0	9.2	10.3
Approach LOS			A	B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	0	370	0	0	0	140	190	0	0	555	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	402	0	0	0	152	207	0	0	603	16
Pedestrians					1						1	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						0	
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1115	1115	603	1115	1115	209	603			208		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1115	1115	603	1115	1115	209	603			208		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	19	100	100	100	84			100		
cM capacity (veh/h)	163	175	499	32	175	830	974			1362		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	413	0	152	207	0	0	603	16
Volume Left	11	0	152	0	0	0	0	0
Volume Right	402	0	0	0	0	0	0	16
cSH	512	1700	974	1700	1700	1700	1700	1700
Volume to Capacity	0.81	0.00	0.16	0.12	0.00	0.00	0.35	0.01
Queue Length 95th (ft)	193	0	14	0	0	0	0	0
Control Delay (s)	35.7	0.0	9.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	A	A					
Approach Delay (s)	35.7	0.0	4.0			0.0		
Approach LOS	E	A						

Intersection Summary			
Average Delay	11.6		
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	115	150	35	215	30	265	530	55	80	275	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.94	1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.98	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1845	1493	1739	1809		1739	1826		1757	1820	
Flt Permitted		0.75	1.00	0.56	1.00		0.54	1.00		0.36	1.00	
Satd. Flow (perm)		1391	1493	1026	1809		986	1826		660	1820	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	125	163	38	234	33	288	576	60	87	299	38
RTOR Reduction (vph)	0	0	130	0	6	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	147	33	38	261	0	288	633	0	87	334	0
Confl. Peds. (#/hr)	10		7	7		10	8		8	8		8
Confl. Bikes (#/hr)			8			17			23			9
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		18.8	18.8	18.8	18.8		71.5	71.5		70.5	70.5	
Effective Green, g (s)		20.0	20.0	20.0	20.0		72.0	72.0		72.0	72.0	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.72	0.72		0.72	0.72	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		278	298	205	361		709	1314		475	1310	
v/s Ratio Prot					c0.14			c0.35			0.18	
v/s Ratio Perm		0.11	0.02	0.04			0.29			0.13		
v/c Ratio		0.53	0.11	0.19	0.72		0.41	0.48		0.18	0.25	
Uniform Delay, d1		35.8	32.7	33.2	37.4		5.5	6.0		4.5	4.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8	0.1	0.2	6.0		1.7	1.3		0.8	0.5	
Delay (s)		36.6	32.8	33.4	43.4		7.3	7.3		5.4	5.3	
Level of Service		D	C	C	D		A	A		A	A	
Approach Delay (s)		34.6			42.2			7.3			5.3	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	15	15	810	25	15	470
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	16	880	27	16	511
Pedestrians	38					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	0.99					
vC, conflicting volume	1476	935			946	
vC1, stage 1 conf vol	932					
vC2, stage 2 conf vol	543					
vCu, unblocked vol	1475	935			946	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	95			98	
cM capacity (veh/h)	324	311			703	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	33	908	16	511
Volume Left	16	0	16	0
Volume Right	16	27	0	0
cSH	317	1700	703	1700
Volume to Capacity	0.10	0.53	0.02	0.30
Queue Length 95th (ft)	9	0	2	0
Control Delay (s)	17.6	0.0	10.2	0.0
Lane LOS	C		B	
Approach Delay (s)	17.6	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	80	70	765	100	65	420
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	76	832	109	71	457
Pedestrians	10		20			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		2			0
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1514	901			950	
vC1, stage 1 conf vol	896					
vC2, stage 2 conf vol	618					
vCu, unblocked vol	1514	901			950	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	77			90	
cM capacity (veh/h)	317	333			717	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	163	940	71	457
Volume Left	87	0	71	0
Volume Right	76	109	0	0
cSH	594	1700	717	1700
Volume to Capacity	0.27	0.55	0.10	0.27
Queue Length 95th (ft)	28	0	8	0
Control Delay (s)	19.9	0.0	10.6	0.0
Lane LOS	C		B	
Approach Delay (s)	19.9	0.0	1.4	
Approach LOS	C			

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	230	15	15	235	35	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	250	16	16	255	38	22
Pedestrians				1	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			280		560	273
vC1, stage 1 conf vol					272	
vC2, stage 2 conf vol					288	
vCu, unblocked vol			246		534	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1269		651	768

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	266	272	60
Volume Left	0	16	38
Volume Right	16	0	22
cSH	1700	1269	690
Volume to Capacity	0.16	0.01	0.09
Queue Length 95th (ft)	0	1	7
Control Delay (s)	0.0	0.6	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	10.7
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	160	0	15	160	20	5	0	15	35	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	174	0	16	174	22	5	0	16	38	0	22
Pedestrians					1			8			22	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	218			182			443	454	183	452	443	207
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	218			182			443	454	183	452	443	207
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	100	98	92	100	97
cM capacity (veh/h)	1327			1384			491	480	853	481	487	818

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	185	212	22	60
Volume Left	11	16	5	38
Volume Right	0	22	16	22
cSH	1327	1384	720	566
Volume to Capacity	0.01	0.01	0.03	0.11
Queue Length 95th (ft)	1	1	2	9
Control Delay (s)	0.5	0.7	10.2	12.1
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	0.7	10.2	12.1
Approach LOS			B	B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	245	0	2	1	245	580	0	0	295	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.25	0.25	0.25	0.86	0.86	0.86	0.95	0.95	0.95
Hourly flow rate (vph)	6	0	282	0	8	4	285	674	0	0	311	11
Pedestrians		1			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		0			0							
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1564	1557	312	1556	1557	675	312			675		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1564	1557	312	1556	1557	675	312			675		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	61	100	91	99	77			100		
cM capacity (veh/h)	69	87	728	46	87	453	1248			915		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	287	12	285	674	0	0	311	11
Volume Left	6	0	285	0	0	0	0	0
Volume Right	282	4	0	0	0	0	0	11
cSH	743	119	1248	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.10	0.23	0.40	0.00	0.00	0.18	0.01
Queue Length 95th (ft)	46	8	22	0	0	0	0	0
Control Delay (s)	14.0	38.7	8.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	E	A					
Approach Delay (s)	14.0	38.7	2.6			0.0		
Approach LOS	B	E						

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Capacity Worksheets: 2018 Background + Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	245	189	41	75	11	106	196	32	43	520	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.89	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.99	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.98		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1859	1410	1736	1820		1747	1810		1757	1849	
Flt Permitted		0.99	1.00	0.29	1.00		0.34	1.00		0.58	1.00	
Satd. Flow (perm)		1846	1410	523	1820		633	1810		1078	1849	
Peak-hour factor, PHF	0.81	0.81	0.81	0.96	0.96	0.96	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	10	302	233	43	78	11	125	231	38	51	612	19
RTOR Reduction (vph)	0	0	179	0	7	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	312	54	43	82	0	125	264	0	51	630	0
Confl. Peds. (#/hr)	3		15	15		3	16		3	3		16
Confl. Bikes (#/hr)			30			6			40			25
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		19.8	19.8	19.8	19.8		60.5	60.5		59.5	59.5	
Effective Green, g (s)		21.0	21.0	21.0	21.0		61.0	61.0		61.0	61.0	
Actuated g/C Ratio		0.23	0.23	0.23	0.23		0.68	0.68		0.68	0.68	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		430	329	122	424		429	1226		730	1253	
v/s Ratio Prot					0.05			0.15			c0.34	
v/s Ratio Perm		c0.17	0.04	0.08			0.20			0.05		
v/c Ratio		0.73	0.17	0.35	0.19		0.29	0.22		0.07	0.50	
Uniform Delay, d1		31.8	27.5	28.8	27.7		5.8	5.5		4.9	7.1	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.1	0.1	0.6	0.1		1.7	0.4		0.2	1.4	
Delay (s)		36.9	27.6	29.5	27.8		7.5	5.9		5.1	8.5	
Level of Service		D	C	C	C		A	A		A	A	
Approach Delay (s)		32.9			28.3			6.4			8.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	7	366	31	15	809
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.84	0.84	0.96	0.96
Hourly flow rate (vph)	42	8	436	37	16	843
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	0.85					
vC, conflicting volume	1328	454			473	
vC1, stage 1 conf vol	454					
vC2, stage 2 conf vol	874					
vCu, unblocked vol	1297	454			473	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	99			99	
cM capacity (veh/h)	345	606			1089	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	51	473	16	843
Volume Left	42	0	16	0
Volume Right	8	37	0	0
cSH	372	1700	1089	1700
Volume to Capacity	0.14	0.28	0.01	0.50
Queue Length 95th (ft)	12	0	1	0
Control Delay (s)	16.2	0.0	8.4	0.0
Lane LOS	C		A	
Approach Delay (s)	16.2	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	74	49	348	22	51	751
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.84	0.84	0.96	0.96
Hourly flow rate (vph)	89	59	414	26	53	782
Pedestrians	4		20			30
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		2			3
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1340	461			444	
vC1, stage 1 conf vol	431					
vC2, stage 2 conf vol	909					
vCu, unblocked vol	1340	461			444	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	90			95	
cM capacity (veh/h)	336	583			1112	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	148	440	53	782
Volume Left	89	0	53	0
Volume Right	59	26	0	0
cSH	559	1700	1112	1700
Volume to Capacity	0.27	0.26	0.05	0.46
Queue Length 95th (ft)	27	0	4	0
Control Delay (s)	16.5	0.0	8.4	0.0
Lane LOS	C		A	
Approach Delay (s)	16.5	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	330	10	8	116	24	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.77	0.77	0.71	0.71
Hourly flow rate (vph)	367	11	10	151	34	23
Pedestrians	3			23		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			2		
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.87		0.87	0.87
vC, conflicting volume			378		547	395
vC1, stage 1 conf vol					372	
vC2, stage 2 conf vol					174	
vCu, unblocked vol			207		401	227
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	97
cM capacity (veh/h)			1184		667	691

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	378	161	56
Volume Left	0	10	34
Volume Right	11	0	23
cSH	1700	1184	677
Volume to Capacity	0.22	0.01	0.08
Queue Length 95th (ft)	0	1	7
Control Delay (s)	0.0	0.6	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	10.8
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	91	1	2	88	18	1	0	16	25	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.80	0.80	0.80	0.71	0.71	0.71	0.61	0.61	0.61
Hourly flow rate (vph)	10	136	1	2	110	22	1	0	23	41	0	26
Pedestrians		17			3			1			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	136			138			328	299	141	312	288	141
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136			138			328	299	141	312	288	141
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	98	93	100	97
cM capacity (veh/h)	1445			1444			592	606	904	615	614	891

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	148	135	24	67
Volume Left	10	2	1	41
Volume Right	1	22	23	26
cSH	1445	1444	877	700
Volume to Capacity	0.01	0.00	0.03	0.10
Queue Length 95th (ft)	1	0	2	8
Control Delay (s)	0.6	0.2	9.2	10.7
Lane LOS	A	A	A	B
Approach Delay (s)	0.6	0.2	9.2	10.7
Approach LOS			A	B

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	357	0	0	0	129	169	0	0	503	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.25	0.25	0.25	0.78	0.78	0.78	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	397	0	0	0	165	217	0	0	559	11
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											0	
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1107	1106	559	1106	1106	218	559			217		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1107	1106	559	1106	1106	218	559			217		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	25	100	100	100	84			100		
cM capacity (veh/h)	164	176	529	41	176	821	1012			1353		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	402	0	165	217	0	0	559	11
Volume Left	6	0	165	0	0	0	0	0
Volume Right	397	0	0	0	0	0	0	11
cSH	536	1700	1012	1700	1700	1700	1700	1700
Volume to Capacity	0.75	0.00	0.16	0.13	0.00	0.00	0.33	0.01
Queue Length 95th (ft)	162	0	15	0	0	0	0	0
Control Delay (s)	29.5	0.0	9.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	A	A					
Approach Delay (s)	29.5	0.0	4.0			0.0		
Approach LOS	D	A						

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	5	329	15	3	750
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	5	358	16	3	815
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						386
pX, platoon unblocked	0.83					
vC, conflicting volume	1188	366			374	
vC1, stage 1 conf vol	366					
vC2, stage 2 conf vol	822					
vCu, unblocked vol	1125	366			374	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			100	
cM capacity (veh/h)	379	679			1185	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	33	374	3	815
Volume Left	27	0	3	0
Volume Right	5	16	0	0
cSH	409	1700	1185	1700
Volume to Capacity	0.08	0.22	0.00	0.48
Queue Length 95th (ft)	6	0	0	0
Control Delay (s)	14.6	0.0	8.0	0.0
Lane LOS	B		A	
Approach Delay (s)	14.6	0.0	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	323	2	10	130	0	3	0	17	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	351	2	11	141	0	3	0	18	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		335										
pX, platoon unblocked				0.86			0.86	0.86	0.86	0.86	0.86	
vC, conflicting volume	141			353			515	515	352	533	516	141
vC1, stage 1 conf vol							352	352		163	163	
vC2, stage 2 conf vol							163	163		370	353	
vCu, unblocked vol	141			159			349	349	158	369	350	141
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	100	100	100
cM capacity (veh/h)	1442			1215			663	608	759	630	602	907

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	353	11	141	22	0
Volume Left	0	0	11	0	3	0
Volume Right	0	2	0	0	18	0
cSH	1700	1700	1215	1700	743	1700
Volume to Capacity	0.00	0.21	0.01	0.08	0.03	0.00
Queue Length 95th (ft)	0	0	1	0	2	0
Control Delay (s)	0.0	0.0	8.0	0.0	10.0	0.0
Lane LOS			A		A	A
Approach Delay (s)	0.0		0.6		10.0	0.0
Approach LOS					A	A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	8	106	8	0	3
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	9	115	9	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	123	120			124	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	123	120			124	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	872	932			1463	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	9	124	3
Volume Left	0	0	0
Volume Right	9	9	0
cSH	932	1700	1463
Volume to Capacity	0.01	0.07	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	2	1	9	7	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	2	1	10	8	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	33	21	34			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	21	34			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	980	1057	1578			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	11	34
Volume Left	16	1	0
Volume Right	2	0	26
cSH	989	1578	1700
Volume to Capacity	0.02	0.00	0.02
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.7	0.7	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	0.7	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	2	33	3	3	4	20	0	5	7	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	2	36	3	3	4	22	0	5	8	0	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	8			38			77	58	20	61	74	5
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	8			38			77	58	20	61	74	5
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	100	99	99	100	98
cM capacity (veh/h)	1613			1572			889	825	1058	922	809	1078

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	50	11	27	28
Volume Left	12	3	22	8
Volume Right	36	4	5	21
cSH	1613	1572	918	1031
Volume to Capacity	0.01	0.00	0.03	0.03
Queue Length 95th (ft)	1	0	2	2
Control Delay (s)	1.8	2.2	9.0	8.6
Lane LOS	A	A	A	A
Approach Delay (s)	1.8	2.2	9.0	8.6
Approach LOS			A	A

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	13.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	4	2	40	20	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	4	2	43	22	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	71	23	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71	23	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	932	1054	1591			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	8	46	24
Volume Left	3	2	0
Volume Right	4	0	2
cSH	998	1591	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.6	0.4	0.0
Lane LOS	A	A	
Approach Delay (s)	8.6	0.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	13.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	1	1	1	2	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	1	1	2	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2				9	2
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2				9	2
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1620				1009	1083

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	4	2	8
Volume Left	3	0	2
Volume Right	0	1	5
cSH	1620	1700	1061
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	5.4	0.0	8.4
Lane LOS	A		A
Approach Delay (s)	5.4	0.0	8.4
Approach LOS			A

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	0	2	12	0	22	1	25	8	8	20	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	2	13	0	24	1	27	9	9	22	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	97	78	22	76	74	32	23			36		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	97	78	22	76	74	32	23			36		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	98	100			99		
cM capacity (veh/h)	861	808	1055	908	811	1042	1592			1575		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	37	37	32
Volume Left	2	13	1	9
Volume Right	2	24	9	1
cSH	948	991	1592	1575
Volume to Capacity	0.00	0.04	0.00	0.01
Queue Length 95th (ft)	0	3	0	0
Control Delay (s)	8.8	8.8	0.2	2.0
Lane LOS	A	A	A	A
Approach Delay (s)	8.8	8.8	0.2	2.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	15.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	7	6	4	25	4	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	7	4	27	4	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	57	21	37			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57	21	37			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	948	1057	1574			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	14	32	37
Volume Left	8	4	0
Volume Right	7	0	33
cSH	996	1574	1700
Volume to Capacity	0.01	0.00	0.02
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.7	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	1.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	12	7	7	12	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	13	8	8	13	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	38	15	16			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38	15	16			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	970	1065	1601			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	15	16
Volume Left	2	8	0
Volume Right	13	0	3
cSH	1050	1601	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.5	3.6	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	3.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	16.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	26	16	12	4	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	28	17	13	4	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	55	8	11			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	55	8	11			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	99			
cM capacity (veh/h)	942	1075	1608			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	30	11
Volume Left	5	17	0
Volume Right	28	0	7
cSH	1051	1608	1700
Volume to Capacity	0.03	0.01	0.01
Queue Length 95th (ft)	2	1	0
Control Delay (s)	8.5	4.2	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	4.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	18.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	0	18	5	0	0	11	2	5	0	3	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	20	5	0	0	12	2	5	0	3	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	35	38	6	54	38	5	9			8		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35	38	6	54	38	5	9			8		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	99	100	100	99			100		
cM capacity (veh/h)	966	848	1077	921	848	1078	1611			1613		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	28	5	20	9
Volume Left	9	5	12	0
Volume Right	20	0	5	5
cSH	1040	921	1611	1613
Volume to Capacity	0.03	0.01	0.01	0.00
Queue Length 95th (ft)	2	0	1	0
Control Delay (s)	8.6	8.9	4.5	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	8.9	4.5	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	18	25	1	2	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	20	27	1	2	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	28				54	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	28				54	28
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1585				952	1048

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	23	28	8
Volume Left	3	0	2
Volume Right	0	1	5
cSH	1585	1700	1018
Volume to Capacity	0.00	0.02	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	1.1	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	1.1	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	13.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	107	139	30	193	27	219	483	50	70	251	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.90	1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.98	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1846	1430	1737	1815		1739	1825		1754	1824	
Flt Permitted		0.78	1.00	0.61	1.00		0.54	1.00		0.39	1.00	
Satd. Flow (perm)		1455	1430	1109	1815		988	1825		717	1824	
Peak-hour factor, PHF	0.98	0.98	0.98	0.81	0.81	0.81	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	18	109	142	37	238	33	238	525	54	84	302	33
RTOR Reduction (vph)	0	0	113	0	6	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	127	29	37	265	0	238	576	0	84	332	0
Confl. Peds. (#/hr)	10		7	7		10	8		8	8		8
Confl. Bikes (#/hr)			30			6			40			25
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		18.9	18.9	18.9	18.9		71.4	71.4		70.4	70.4	
Effective Green, g (s)		20.1	20.1	20.1	20.1		71.9	71.9		71.9	71.9	
Actuated g/C Ratio		0.20	0.20	0.20	0.20		0.72	0.72		0.72	0.72	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		292	287	222	364		710	1312		515	1311	
v/s Ratio Prot					c0.15			c0.32			0.18	
v/s Ratio Perm		0.09	0.02	0.03			0.24			0.12		
v/c Ratio		0.43	0.10	0.17	0.73		0.34	0.44		0.16	0.25	
Uniform Delay, d1		35.0	32.6	33.0	37.4		5.2	5.8		4.5	4.8	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4	0.1	0.1	6.1		1.3	1.1		0.7	0.5	
Delay (s)		35.4	32.6	33.2	43.5		6.5	6.8		5.2	5.3	
Level of Service		D	C	C	D		A	A		A	A	
Approach Delay (s)		33.9			42.2			6.7			5.3	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	13	766	42	11	444
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	29	15	798	44	12	493
Pedestrians	38					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	1.00					
vC, conflicting volume	1376	861			880	
vC1, stage 1 conf vol	858					
vC2, stage 2 conf vol	518					
vCu, unblocked vol	1376	861			880	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			98	
cM capacity (veh/h)	351	343			744	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	44	842	12	493
Volume Left	29	0	12	0
Volume Right	15	44	0	0
cSH	348	1700	744	1700
Volume to Capacity	0.13	0.50	0.02	0.29
Queue Length 95th (ft)	11	0	1	0
Control Delay (s)	16.8	0.0	9.9	0.0
Lane LOS	C		A	
Approach Delay (s)	16.8	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	74	66	744	97	59	410
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	86	77	775	101	66	456
Pedestrians	10		20			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		2			0
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1442	841			886	
vC1, stage 1 conf vol	836					
vC2, stage 2 conf vol	607					
vCu, unblocked vol	1442	841			886	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	79			91	
cM capacity (veh/h)	336	360			758	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	163	876	66	456
Volume Left	86	0	66	0
Volume Right	77	101	0	0
cSH	635	1700	758	1700
Volume to Capacity	0.26	0.52	0.09	0.27
Queue Length 95th (ft)	25	0	7	0
Control Delay (s)	18.6	0.0	10.2	0.0
Lane LOS	C		B	
Approach Delay (s)	18.6	0.0	1.3	
Approach LOS	C			

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	220	14	20	228	30	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.90	0.90	0.69	0.69
Hourly flow rate (vph)	275	18	22	253	43	29
Pedestrians				1	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			306		596	299
vC1, stage 1 conf vol					298	
vC2, stage 2 conf vol					298	
vCu, unblocked vol			289		582	281
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	96
cM capacity (veh/h)			1240		632	738

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	292	276	72
Volume Left	0	22	43
Volume Right	18	0	29
cSH	1700	1240	670
Volume to Capacity	0.17	0.02	0.11
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.8	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	11.0
Approach LOS			B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	138	2	14	148	29	1	0	12	38	2	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.88	0.88	0.88	0.54	0.54	0.54	0.69	0.69	0.69
Hourly flow rate (vph)	19	172	2	16	168	33	2	0	22	55	3	32
Pedestrians					1			8			22	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	223			183			469	474	183	473	459	207
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	223			183			469	474	183	473	459	207
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	97	88	99	96
cM capacity (veh/h)	1321			1383			461	465	853	461	474	819

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	194	217	24	90
Volume Left	19	16	2	55
Volume Right	2	33	22	32
cSH	1321	1383	801	546
Volume to Capacity	0.01	0.01	0.03	0.16
Queue Length 95th (ft)	1	1	2	15
Control Delay (s)	0.9	0.7	9.6	12.9
Lane LOS	A	A	A	B
Approach Delay (s)	0.9	0.7	9.6	12.9
Approach LOS			A	B

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	1	237	0	2	1	247	479	0	0	245	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.25	0.25	0.25	0.86	0.86	0.86	0.95	0.95	0.95
Hourly flow rate (vph)	5	1	272	0	8	4	287	557	0	0	258	8
Pedestrians								1			1	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								0			0	
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1398	1389	259	1391	1389	558	258			557		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1398	1389	259	1391	1389	558	258			557		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	99	65	100	93	99	78			100		
cM capacity (veh/h)	92	111	779	64	111	529	1307			1014		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	278	12	287	557	0	0	258	8
Volume Left	5	0	287	0	0	0	0	0
Volume Right	272	4	0	0	0	0	0	8
cSH	796	151	1307	1700	1700	1700	1700	1700
Volume to Capacity	0.35	0.08	0.22	0.33	0.00	0.00	0.15	0.00
Queue Length 95th (ft)	39	6	21	0	0	0	0	0
Control Delay (s)	12.8	30.9	8.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	D	A					
Approach Delay (s)	12.8	30.9	2.9			0.0		
Approach LOS	B	D						

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	16	3	749	26	5	420
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	3	814	28	5	457
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						386
pX, platoon unblocked	0.95					
vC, conflicting volume	1296	828			842	
vC1, stage 1 conf vol	828					
vC2, stage 2 conf vol	467					
vCu, unblocked vol	1286	828			842	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			99	
cM capacity (veh/h)	377	371			793	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	21	842	5	457
Volume Left	17	0	5	0
Volume Right	3	28	0	0
cSH	376	1700	793	1700
Volume to Capacity	0.05	0.50	0.01	0.27
Queue Length 95th (ft)	4	0	1	0
Control Delay (s)	15.1	0.0	9.6	0.0
Lane LOS	C		A	
Approach Delay (s)	15.1	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	223	3	18	240	0	2	0	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	242	3	20	261	0	2	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		335										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	261			246			544	544	244	554	546	261
vC1, stage 1 conf vol							244	244		300	300	
vC2, stage 2 conf vol							300	300		254	246	
vCu, unblocked vol	261			190			502	502	189	513	504	261
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	99	100	100	100
cM capacity (veh/h)	1304			1325			624	587	817	609	582	778

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	246	20	261	14	0
Volume Left	0	0	20	0	2	0
Volume Right	0	3	0	0	12	0
cSH	1700	1700	1325	1700	780	1700
Volume to Capacity	0.00	0.14	0.01	0.15	0.02	0.00
Queue Length 95th (ft)	0	0	1	0	1	0
Control Delay (s)	0.0	0.0	7.8	0.0	9.7	0.0
Lane LOS			A		A	A
Approach Delay (s)	0.0		0.5		9.7	0.0
Approach LOS					A	A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	1	29	1	1	24
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	32	1	1	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	60	32			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	60	32			33	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	946	1042			1579	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	33	27
Volume Left	3	0	1
Volume Right	1	1	0
cSH	968	1700	1579
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.7	0.0	0.3
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	0.3
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	26	2	1	7	9	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	2	1	8	10	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	28	18	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	28	18	26			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	987	1061	1588			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	9	26
Volume Left	28	1	0
Volume Right	2	0	16
cSH	991	1588	1700
Volume to Capacity	0.03	0.00	0.02
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.7	0.9	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	0.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	3	30	6	2	7	24	0	10	4	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	3	33	7	2	8	26	0	11	4	0	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	10			36			95	86	20	93	98	6
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	10			36			95	86	20	93	98	6
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	99	100	100	99
cM capacity (veh/h)	1610			1575			865	790	1058	870	778	1077

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	58	16	37	17
Volume Left	22	7	26	4
Volume Right	33	8	11	13
cSH	1610	1575	914	1016
Volume to Capacity	0.01	0.00	0.04	0.02
Queue Length 95th (ft)	1	0	3	1
Control Delay (s)	2.8	2.9	9.1	8.6
Lane LOS	A	A	A	A
Approach Delay (s)	2.8	2.9	9.1	8.6
Approach LOS			A	A

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	15.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	2	4	50	30	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	4	54	33	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	97	34	36			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	97	34	36			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	899	1039	1575			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	4	59	36
Volume Left	2	4	0
Volume Right	2	0	3
cSH	964	1575	1700
Volume to Capacity	0.00	0.00	0.02
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.8	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	0.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	1	1	2	1	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	1	2	1	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3				14	2
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3				14	2
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1619				1001	1082

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	7	3	4
Volume Left	5	0	1
Volume Right	0	2	3
cSH	1619	1700	1061
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	6.0	0.0	8.4
Lane LOS	A		A
Approach Delay (s)	6.0	0.0	8.4
Approach LOS			A

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	14.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	1	28	0	31	2	35	13	18	25	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	1	30	0	34	2	38	14	20	27	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	151	124	28	118	118	45	29			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151	124	28	118	118	45	29			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	97	100			99		
cM capacity (veh/h)	782	756	1047	848	762	1025	1584			1554		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	64	54	49
Volume Left	1	30	2	20
Volume Right	1	34	14	2
cSH	895	932	1584	1554
Volume to Capacity	0.00	0.07	0.00	0.01
Queue Length 95th (ft)	0	6	0	1
Control Delay (s)	9.0	9.1	0.3	3.0
Lane LOS	A	A	A	A
Approach Delay (s)	9.0	9.1	0.3	3.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	4	6	35	45	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	4	7	38	49	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	104	53	57			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	104	53	57			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	890	1015	1548			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	9	45	57
Volume Left	4	7	0
Volume Right	4	0	8
cSH	949	1548	1700
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.8	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	16.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	14	13	12	7	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	15	14	13	8	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	50	9	10			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	50	9	10			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	951	1073	1610			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	27	10
Volume Left	3	14	0
Volume Right	15	0	2
cSH	1049	1610	1700
Volume to Capacity	0.02	0.01	0.01
Queue Length 95th (ft)	1	1	0
Control Delay (s)	8.5	3.8	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	3.8	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	17	28	7	7	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	18	30	8	8	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	82	13	18			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82	13	18			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	98			
cM capacity (veh/h)	903	1067	1598			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	38	18
Volume Left	3	30	0
Volume Right	18	0	11
cSH	1039	1598	1700
Volume to Capacity	0.02	0.02	0.01
Queue Length 95th (ft)	2	1	0
Control Delay (s)	8.5	5.9	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	5.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	11	3	0	0	19	3	3	0	2	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	0	12	3	0	0	21	3	3	0	2	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	53	54	7	65	57	5	11			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53	54	7	65	57	5	11			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	100	100	100	99			100		
cM capacity (veh/h)	937	826	1076	910	823	1078	1608			1614		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	17	3	27	11
Volume Left	5	3	21	0
Volume Right	12	0	3	9
cSH	1028	910	1608	1614
Volume to Capacity	0.02	0.00	0.01	0.00
Queue Length 95th (ft)	1	0	1	0
Control Delay (s)	8.6	9.0	5.5	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	9.0	5.5	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	31	16	2	1	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	34	17	2	1	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	20				63	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20				63	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1597				940	1060

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	20	4
Volume Left	5	0	1
Volume Right	0	2	3
cSH	1597	1700	1027
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	1.0	0.0	8.5
Lane LOS	A		A
Approach Delay (s)	1.0	0.0	8.5
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Capacity Worksheets: 2035 Background + Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	271	207	45	87	17	128	218	40	51	572	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.89	1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		1.00	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.98		1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1859	1415	1740	1805		1770	1805		1759	1848	
Flt Permitted		0.99	1.00	0.26	1.00		0.30	1.00		0.55	1.00	
Satd. Flow (perm)		1844	1415	474	1805		552	1805		1025	1848	
Peak-hour factor, PHF	0.81	0.81	0.81	0.96	0.96	0.96	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	12	335	256	47	91	18	151	256	47	60	673	24
RTOR Reduction (vph)	0	0	160	0	9	0	0	6	0	0	1	0
Lane Group Flow (vph)	0	347	96	47	100	0	151	297	0	60	696	0
Confl. Peds. (#/hr)	3		15	15		3	16		3	3		16
Confl. Bikes (#/hr)			30			6			40			25
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		21.5	21.5	21.5	21.5		58.8	58.8		57.8	57.8	
Effective Green, g (s)		22.7	22.7	22.7	22.7		59.3	59.3		59.3	59.3	
Actuated g/C Ratio		0.25	0.25	0.25	0.25		0.66	0.66		0.66	0.66	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		465	356	119	455		363	1189		675	1217	
v/s Ratio Prot					0.06			0.16			c0.38	
v/s Ratio Perm		c0.19	0.07	0.10			0.27			0.06		
v/c Ratio		0.75	0.27	0.39	0.22		0.42	0.25		0.09	0.57	
Uniform Delay, d1		31.0	27.0	27.9	26.6		7.2	6.3		5.6	8.4	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.6	0.1	0.8	0.1		3.5	0.5		0.3	2.0	
Delay (s)		36.6	27.1	28.7	26.7		10.7	6.8		5.8	10.4	
Level of Service		D	C	C	C		B	A		A	B	
Approach Delay (s)		32.6			27.3			8.1			10.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	41	8	400	37	21	880
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.84	0.84	0.96	0.96
Hourly flow rate (vph)	49	10	476	44	22	917
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	0.80					
vC, conflicting volume	1459	498			520	
vC1, stage 1 conf vol	498					
vC2, stage 2 conf vol	960					
vCu, unblocked vol	1449	498			520	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	98			98	
cM capacity (veh/h)	303	572			1046	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	59	520	22	917
Volume Left	49	0	22	0
Volume Right	10	44	0	0
cSH	328	1700	1046	1700
Volume to Capacity	0.18	0.31	0.02	0.54
Queue Length 95th (ft)	16	0	2	0
Control Delay (s)	18.4	0.0	8.5	0.0
Lane LOS	C		A	
Approach Delay (s)	18.4	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	83	57	380	25	59	861
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.84	0.84	0.96	0.96
Hourly flow rate (vph)	100	69	452	30	61	897
Pedestrians	4		20			30
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		2			3
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1511	501			486	
vC1, stage 1 conf vol	471					
vC2, stage 2 conf vol	1040					
vCu, unblocked vol	1511	501			486	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	88			94	
cM capacity (veh/h)	290	554			1073	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	169	482	61	897
Volume Left	100	0	61	0
Volume Right	69	30	0	0
cSH	489	1700	1073	1700
Volume to Capacity	0.34	0.28	0.06	0.53
Queue Length 95th (ft)	38	0	5	0
Control Delay (s)	19.2	0.0	8.6	0.0
Lane LOS	C		A	
Approach Delay (s)	19.2	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	362	10	8	130	31	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.77	0.77	0.71	0.71
Hourly flow rate (vph)	402	11	10	169	44	25
Pedestrians	3			23		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			2		
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.85		0.85	0.85
vC, conflicting volume			413		600	431
vC1, stage 1 conf vol					408	
vC2, stage 2 conf vol					193	
vCu, unblocked vol			227		446	248
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	96
cM capacity (veh/h)			1145		640	662

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	413	179	69
Volume Left	0	10	44
Volume Right	11	0	25
cSH	1700	1145	648
Volume to Capacity	0.24	0.01	0.11
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.6	11.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	11.2
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	99	0	0	97	21	5	0	20	31	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.80	0.80	0.80	0.71	0.71	0.71	0.61	0.61	0.61
Hourly flow rate (vph)	15	148	0	0	121	26	7	0	28	51	0	13
Pedestrians		17			3			1			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	150			149			343	329	152	346	316	154
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150			149			343	329	152	346	316	154
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	97	91	100	99
cM capacity (veh/h)	1427			1431			587	582	891	580	592	877

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	163	148	35	64
Volume Left	15	0	7	51
Volume Right	0	26	28	13
cSH	1427	1431	808	623
Volume to Capacity	0.01	0.00	0.04	0.10
Queue Length 95th (ft)	1	0	3	9
Control Delay (s)	0.8	0.0	9.7	11.4
Lane LOS	A		A	B
Approach Delay (s)	0.8	0.0	9.7	11.4
Approach LOS			A	B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	0	395	0	0	0	155	190	0	0	555	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.25	0.25	0.25	0.78	0.78	0.78	0.90	0.90	0.90
Hourly flow rate (vph)	11	0	439	0	0	0	199	244	0	0	617	17
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											0	
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1259	1258	617	1258	1258	245	617			244		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1259	1258	617	1258	1258	245	617			244		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	10	100	100	100	79			100		
cM capacity (veh/h)	124	136	490	13	136	794	963			1323		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	450	0	199	244	0	0	617	17
Volume Left	11	0	199	0	0	0	0	0
Volume Right	439	0	0	0	0	0	0	17
cSH	503	1700	963	1700	1700	1700	1700	1700
Volume to Capacity	0.90	0.00	0.21	0.14	0.00	0.00	0.36	0.01
Queue Length 95th (ft)	253	0	19	0	0	0	0	0
Control Delay (s)	47.8	0.0	9.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	A	A					
Approach Delay (s)	47.8	0.0	4.4			0.0		
Approach LOS	E	A						

Intersection Summary			
Average Delay	15.4		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	5	381	15	3	821
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	5	414	16	3	892
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						386
pX, platoon unblocked	0.79					
vC, conflicting volume	1321	422			430	
vC1, stage 1 conf vol	422					
vC2, stage 2 conf vol	899					
vCu, unblocked vol	1274	422			430	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			100	
cM capacity (veh/h)	337	631			1129	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	33	430	3	892
Volume Left	27	0	3	0
Volume Right	5	16	0	0
cSH	366	1700	1129	1700
Volume to Capacity	0.09	0.25	0.00	0.52
Queue Length 95th (ft)	7	0	0	0
Control Delay (s)	15.8	0.0	8.2	0.0
Lane LOS	C		A	
Approach Delay (s)	15.8	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	355	2	10	151	0	3	0	17	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	386	2	11	164	0	3	0	18	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		335										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	164			388			573	573	387	590	574	164
vC1, stage 1 conf vol							387	387		186	186	
vC2, stage 2 conf vol							186	186		404	388	
vCu, unblocked vol	164			177			397	397	176	418	398	164
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	97	100	100	100
cM capacity (veh/h)	1414			1176			632	583	729	600	576	880

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	388	11	164	22	0
Volume Left	0	0	11	0	3	0
Volume Right	0	2	0	0	18	0
cSH	1700	1700	1176	1700	713	1700
Volume to Capacity	0.00	0.23	0.01	0.10	0.03	0.00
Queue Length 95th (ft)	0	0	1	0	2	0
Control Delay (s)	0.0	0.0	8.1	0.0	10.2	0.0
Lane LOS			A		B	A
Approach Delay (s)	0.0		0.5		10.2	0.0
Approach LOS					B	A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	8	106	8	0	3
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	9	115	9	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	123	120			124	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	123	120			124	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	872	932			1463	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	9	124	3
Volume Left	0	0	0
Volume Right	9	9	0
cSH	932	1700	1463
Volume to Capacity	0.01	0.07	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	2	1	9	7	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	2	1	10	8	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	33	21	34			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	21	34			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	980	1057	1578			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	11	34
Volume Left	16	1	0
Volume Right	2	0	26
cSH	989	1578	1700
Volume to Capacity	0.02	0.00	0.02
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.7	0.7	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	0.7	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	2	33	3	3	4	20	0	5	7	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	2	36	3	3	4	22	0	5	8	0	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	8			38			77	58	20	61	74	5
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	8			38			77	58	20	61	74	5
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	100	99	99	100	98
cM capacity (veh/h)	1613			1572			889	825	1058	922	809	1078

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	50	11	27	28
Volume Left	12	3	22	8
Volume Right	36	4	5	21
cSH	1613	1572	918	1031
Volume to Capacity	0.01	0.00	0.03	0.03
Queue Length 95th (ft)	1	0	2	2
Control Delay (s)	1.8	2.2	9.0	8.6
Lane LOS	A	A	A	A
Approach Delay (s)	1.8	2.2	9.0	8.6
Approach LOS			A	A

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	13.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	4	2	40	20	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	4	2	43	22	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	71	23	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71	23	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	932	1054	1591			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	8	46	24
Volume Left	3	2	0
Volume Right	4	0	2
cSH	998	1591	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.6	0.4	0.0
Lane LOS	A	A	
Approach Delay (s)	8.6	0.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	13.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	1	1	1	2	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	1	1	2	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2				9	2
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2				9	2
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1620				1009	1083

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	4	2	8
Volume Left	3	0	2
Volume Right	0	1	5
cSH	1620	1700	1061
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	5.4	0.0	8.4
Lane LOS	A		A
Approach Delay (s)	5.4	0.0	8.4
Approach LOS			A

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	0	2	12	0	22	1	25	8	8	20	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	2	13	0	24	1	27	9	9	22	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	97	78	22	76	74	32	23			36		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	97	78	22	76	74	32	23			36		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	98	100			99		
cM capacity (veh/h)	861	808	1055	908	811	1042	1592			1575		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	37	37	32
Volume Left	2	13	1	9
Volume Right	2	24	9	1
cSH	948	991	1592	1575
Volume to Capacity	0.00	0.04	0.00	0.01
Queue Length 95th (ft)	0	3	0	0
Control Delay (s)	8.8	8.8	0.2	2.0
Lane LOS	A	A	A	A
Approach Delay (s)	8.8	8.8	0.2	2.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	15.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	7	6	4	25	4	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	7	4	27	4	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	57	21	37			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57	21	37			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	948	1057	1574			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	14	32	37
Volume Left	8	4	0
Volume Right	7	0	33
cSH	996	1574	1700
Volume to Capacity	0.01	0.00	0.02
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.7	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	1.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	12	7	10	15	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	13	8	11	16	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	44	18	20			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	44	18	20			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	962	1061	1597			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	18	20
Volume Left	2	8	0
Volume Right	13	0	3
cSH	1045	1597	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.5	3.0	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	3.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	16.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	26	16	12	4	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	28	17	13	4	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	55	8	11			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	55	8	11			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	99			
cM capacity (veh/h)	942	1075	1608			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	30	11
Volume Left	5	17	0
Volume Right	28	0	7
cSH	1051	1608	1700
Volume to Capacity	0.03	0.01	0.01
Queue Length 95th (ft)	2	1	0
Control Delay (s)	8.5	4.2	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	4.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	18.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	0	18	5	0	0	11	2	5	0	3	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	20	5	0	0	12	2	5	0	3	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	35	38	6	54	38	5	9			8		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35	38	6	54	38	5	9			8		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	99	100	100	99			100		
cM capacity (veh/h)	966	848	1077	921	848	1078	1611			1613		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	28	5	20	9
Volume Left	9	5	12	0
Volume Right	20	0	5	5
cSH	1040	921	1611	1613
Volume to Capacity	0.03	0.01	0.01	0.00
Queue Length 95th (ft)	2	0	1	0
Control Delay (s)	8.6	8.9	4.5	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	8.9	4.5	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	18	25	1	2	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	20	27	1	2	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	28				54	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	28				54	28
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1585				952	1048

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	23	28	8
Volume Left	3	0	2
Volume Right	0	1	5
cSH	1585	1700	1018
Volume to Capacity	0.00	0.02	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	1.1	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	1.1	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	13.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	117	153	35	216	31	267	532	55	82	278	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.91	1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.98	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1846	1437	1738	1814		1742	1824		1758	1823	
Flt Permitted		0.75	1.00	0.59	1.00		0.51	1.00		0.35	1.00	
Satd. Flow (perm)		1388	1437	1082	1814		937	1824		643	1823	
Peak-hour factor, PHF	0.98	0.98	0.98	0.81	0.81	0.81	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	20	119	156	43	267	38	290	578	60	99	335	37
RTOR Reduction (vph)	0	0	122	0	5	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	139	34	43	300	0	290	635	0	99	369	0
Confl. Peds. (#/hr)	10		7	7		10	8		8	8		8
Confl. Bikes (#/hr)			30			6			40			25
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)		20.8	20.8	20.8	20.8		69.5	69.5		68.5	68.5	
Effective Green, g (s)		22.0	22.0	22.0	22.0		70.0	70.0		70.0	70.0	
Actuated g/C Ratio		0.22	0.22	0.22	0.22		0.70	0.70		0.70	0.70	
Clearance Time (s)		5.2	5.2	5.2	5.2		4.5	4.5		5.5	5.5	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		305	316	238	399		655	1276		450	1276	
v/s Ratio Prot					c0.17			c0.35			0.20	
v/s Ratio Perm		0.10	0.02	0.04			0.31			0.15		
v/c Ratio		0.46	0.11	0.18	0.75		0.44	0.50		0.22	0.29	
Uniform Delay, d1		33.8	31.2	31.7	36.4		6.5	6.9		5.3	5.6	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4	0.1	0.1	6.9		2.2	1.4		1.1	0.6	
Delay (s)		34.2	31.2	31.8	43.3		8.7	8.3		6.4	6.2	
Level of Service		C	C	C	D		A	A		A	A	
Approach Delay (s)		32.6			41.9			8.4			6.3	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	28	16	836	47	16	486
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	33	19	871	49	18	540
Pedestrians	38					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						836
pX, platoon unblocked	0.98					
vC, conflicting volume	1509	936			958	
vC1, stage 1 conf vol	933					
vC2, stage 2 conf vol	576					
vCu, unblocked vol	1509	936			958	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	94			97	
cM capacity (veh/h)	319	310			695	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	51	920	18	540
Volume Left	33	0	18	0
Volume Right	19	49	0	0
cSH	316	1700	695	1700
Volume to Capacity	0.16	0.54	0.03	0.32
Queue Length 95th (ft)	14	0	2	0
Control Delay (s)	18.6	0.0	10.3	0.0
Lane LOS	C		B	
Approach Delay (s)	18.6	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	85	74	808	108	67	446
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	99	86	842	112	74	496
Pedestrians	10		20			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		2			0
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			1287			
pX, platoon unblocked						
vC, conflicting volume	1572	913			964	
vC1, stage 1 conf vol	908					
vC2, stage 2 conf vol	664					
vCu, unblocked vol	1572	913			964	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	74			89	
cM capacity (veh/h)	305	327			708	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	185	954	74	496
Volume Left	99	0	74	0
Volume Right	86	112	0	0
cSH	571	1700	708	1700
Volume to Capacity	0.32	0.56	0.11	0.29
Queue Length 95th (ft)	35	0	9	0
Control Delay (s)	21.2	0.0	10.7	0.0
Lane LOS	C		B	
Approach Delay (s)	21.2	0.0	1.4	
Approach LOS	C			

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	241	14	20	253	36	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.90	0.90	0.69	0.69
Hourly flow rate (vph)	301	18	22	281	52	36
Pedestrians				1	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	667					
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			333		650	325
vC1, stage 1 conf vol					324	
vC2, stage 2 conf vol					326	
vCu, unblocked vol			313		635	305
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		91	95
cM capacity (veh/h)			1212		608	713

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	319	303	88
Volume Left	0	22	52
Volume Right	18	0	36
cSH	1700	1212	647
Volume to Capacity	0.19	0.02	0.14
Queue Length 95th (ft)	0	1	12
Control Delay (s)	0.0	0.8	11.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	11.4
Approach LOS			B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	162	0	15	164	31	5	0	15	42	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.88	0.88	0.88	0.54	0.54	0.54	0.69	0.69	0.69
Hourly flow rate (vph)	22	202	0	17	186	35	9	0	28	61	0	36
Pedestrians					1			8			22	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	244			210			530	533	212	536	516	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	244			210			530	533	212	536	516	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			98	100	97	85	100	95
cM capacity (veh/h)	1298			1351			418	428	822	414	438	798

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	225	239	37	97
Volume Left	22	17	9	61
Volume Right	0	35	28	36
cSH	1298	1351	662	504
Volume to Capacity	0.02	0.01	0.06	0.19
Queue Length 95th (ft)	1	1	4	18
Control Delay (s)	0.9	0.7	10.8	13.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.9	0.7	10.8	13.8
Approach LOS			B	B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	29.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	261	0	2	1	271	580	0	0	295	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.25	0.25	0.25	0.86	0.86	0.86	0.95	0.95	0.95
Hourly flow rate (vph)	6	0	300	0	8	4	315	674	0	0	311	11
Pedestrians								1			1	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								0			0	
Right turn flare (veh)			4									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1624	1615	312	1616	1615	675	311			674		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1624	1615	312	1616	1615	675	311			674		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	59	100	90	99	75			100		
cM capacity (veh/h)	61	78	728	39	78	453	1250			917		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	306	12	315	674	0	0	311	11
Volume Left	6	0	315	0	0	0	0	0
Volume Right	300	4	0	0	0	0	0	11
cSH	742	107	1250	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.11	0.25	0.40	0.00	0.00	0.18	0.01
Queue Length 95th (ft)	51	9	25	0	0	0	0	0
Control Delay (s)	14.4	42.8	8.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	E	A					
Approach Delay (s)	14.4	42.8	2.8			0.0		
Approach LOS	B	E						

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	16	3	851	26	5	461
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	3	925	28	5	501
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						386
pX, platoon unblocked	0.94					
vC, conflicting volume	1451	939			953	
vC1, stage 1 conf vol	939					
vC2, stage 2 conf vol	512					
vCu, unblocked vol	1448	939			953	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			99	
cM capacity (veh/h)	334	320			721	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	21	953	5	501
Volume Left	17	0	5	0
Volume Right	3	28	0	0
cSH	332	1700	721	1700
Volume to Capacity	0.06	0.56	0.01	0.29
Queue Length 95th (ft)	5	0	1	0
Control Delay (s)	16.6	0.0	10.0	0.0
Lane LOS	C		B	
Approach Delay (s)	16.6	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	244	3	18	271	0	2	0	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	265	3	20	295	0	2	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		335										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	295			268			601	601	267	611	602	295
vC1, stage 1 conf vol							267	267		334	334	
vC2, stage 2 conf vol							334	334		277	268	
vCu, unblocked vol	295			211			558	558	209	569	560	295
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	98	100	100	100
cM capacity (veh/h)	1267			1299			594	564	794	581	558	745

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	268	20	295	14	0
Volume Left	0	0	20	0	2	0
Volume Right	0	3	0	0	12	0
cSH	1700	1700	1299	1700	755	1700
Volume to Capacity	0.00	0.16	0.02	0.17	0.02	0.00
Queue Length 95th (ft)	0	0	1	0	1	0
Control Delay (s)	0.0	0.0	7.8	0.0	9.9	0.0
Lane LOS			A		A	A
Approach Delay (s)	0.0		0.5		9.9	0.0
Approach LOS					A	A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	1	29	1	1	24
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	32	1	1	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	60	32			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	60	32			33	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	946	1042			1579	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	33	27
Volume Left	3	0	1
Volume Right	1	1	0
cSH	968	1700	1579
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.7	0.0	0.3
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	0.3
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	26	2	1	7	9	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	2	1	8	10	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	28	18	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	28	18	26			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	987	1061	1588			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	9	26
Volume Left	28	1	0
Volume Right	2	0	16
cSH	991	1588	1700
Volume to Capacity	0.03	0.00	0.02
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.7	0.9	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	0.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	3	30	6	2	7	24	0	10	4	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	3	33	7	2	8	26	0	11	4	0	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	10			36			95	86	20	93	98	6
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	10			36			95	86	20	93	98	6
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	99	100	100	99
cM capacity (veh/h)	1610			1575			865	790	1058	870	778	1077

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	58	16	37	17
Volume Left	22	7	26	4
Volume Right	33	8	11	13
cSH	1610	1575	914	1016
Volume to Capacity	0.01	0.00	0.04	0.02
Queue Length 95th (ft)	1	0	3	1
Control Delay (s)	2.8	2.9	9.1	8.6
Lane LOS	A	A	A	A
Approach Delay (s)	2.8	2.9	9.1	8.6
Approach LOS			A	A

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	15.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	2	4	50	30	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	4	54	33	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	97	34	36			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	97	34	36			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	899	1039	1575			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	4	59	36
Volume Left	2	4	0
Volume Right	2	0	3
cSH	964	1575	1700
Volume to Capacity	0.00	0.00	0.02
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.8	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	0.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	1	1	2	1	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	1	2	1	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3				14	2
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3				14	2
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1619				1001	1082

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	7	3	4
Volume Left	5	0	1
Volume Right	0	2	3
cSH	1619	1700	1061
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	6.0	0.0	8.4
Lane LOS	A		A
Approach Delay (s)	6.0	0.0	8.4
Approach LOS			A

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	14.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	1	28	0	31	2	35	13	18	25	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	1	30	0	34	2	38	14	20	27	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	151	124	28	118	118	45	29			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151	124	28	118	118	45	29			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	97	100			99		
cM capacity (veh/h)	782	756	1047	848	762	1025	1584			1554		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	64	54	49
Volume Left	1	30	2	20
Volume Right	1	34	14	2
cSH	895	932	1584	1554
Volume to Capacity	0.00	0.07	0.00	0.01
Queue Length 95th (ft)	0	6	0	1
Control Delay (s)	9.0	9.1	0.3	3.0
Lane LOS	A	A	A	A
Approach Delay (s)	9.0	9.1	0.3	3.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	4	6	35	45	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	4	7	38	49	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	104	53	57			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	104	53	57			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	890	1015	1548			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	9	45	57
Volume Left	4	7	0
Volume Right	4	0	8
cSH	949	1548	1700
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.8	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	16.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	14	13	15	10	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	15	14	16	11	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	57	12	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57	12	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	943	1069	1605			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	30	13
Volume Left	3	14	0
Volume Right	15	0	2
cSH	1044	1605	1700
Volume to Capacity	0.02	0.01	0.01
Queue Length 95th (ft)	1	1	0
Control Delay (s)	8.5	3.4	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	3.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	18.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	17	28	7	7	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	18	30	8	8	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	82	13	18			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82	13	18			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	98			
cM capacity (veh/h)	903	1067	1598			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	38	18
Volume Left	3	30	0
Volume Right	18	0	11
cSH	1039	1598	1700
Volume to Capacity	0.02	0.02	0.01
Queue Length 95th (ft)	2	1	0
Control Delay (s)	8.5	5.9	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	5.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	11	3	0	0	19	3	3	0	2	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	0	12	3	0	0	21	3	3	0	2	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	53	54	7	65	57	5	11			7		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53	54	7	65	57	5	11			7		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	100	100	100	99			100		
cM capacity (veh/h)	937	826	1076	910	823	1078	1608			1614		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	17	3	27	11
Volume Left	5	3	21	0
Volume Right	12	0	3	9
cSH	1028	910	1608	1614
Volume to Capacity	0.02	0.00	0.01	0.00
Queue Length 95th (ft)	1	0	1	0
Control Delay (s)	8.6	9.0	5.5	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	9.0	5.5	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	31	16	2	1	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	34	17	2	1	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	20				63	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20				63	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1597				940	1060

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	20	4
Volume Left	5	0	1
Volume Right	0	2	3
cSH	1597	1700	1027
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	1.0	0.0	8.5
Lane LOS	A		A
Approach Delay (s)	1.0	0.0	8.5
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Transportation Demand Management Plan

MEMORANDUM

To: Armory Land Investors, LLC

From: Steve Tuttle, PE, PTOE

Date: March 21, 2016

Project: North Boulder Armory Redevelopment

Subject: Transportation Demand Management Plan - Updated

The North Boulder Armory Redevelopment proposed to develop 200 residential units and 8,400 square feet (SF) of retail/restaurant use located at the southeast corner of the Broadway and Lee Hill Drive intersection. In accordance with the City of Boulder site review process, a Transportation Demand Management (TDM) Plan is required which outlines strategies to mitigate traffic impacts created by the proposed development and implementable measures for promoting alternate modes of travel.

The 8.5 ± acre project is located in an urban, mixed-use environment and will take advantage of nearby pedestrian, bicycle, and transit connections. Currently, there are on-street bike lanes on both sides of Broadway, Lee Hill Drive, and Yarmouth Avenue. These lead to other city and regional bike facilities. The site is surrounded by residential neighborhoods that will have the opportunity to walk or bike to the retail/restaurants and the residents of the Boulder Armory Redevelopment site will be able to utilize the area multi-modal transportation network for off-site trips.

Regional and local bus routes can be accessed on Broadway and Yarmouth Avenue within close proximity to the project site. Broadway serves as major transit corridor with the Y, 204 and SKIP routes served directly adjacent to the site. Routes Y and SKIP travel along Broadway with bus stops adjacent to the project site. Route SKIP (Broadway) travels the length of Boulder along

Broadway connecting to downtown, University of Colorado, Boulder Transit Center, two park-n-rides, and various community destinations. Route Y is a regional route between Boulder and Lyons. It travels along US 36 from the Lyons park-n-ride and enters Boulder on Broadway, ending at the Boulder Transit Center in downtown. The bus stops for southbound routes on Broadway are at Front Range Drive and just south of Yellow Pine Avenue. The bus stop for northbound routes on Broadway is just north of Yarmouth Avenue. The bus stops for Route 204 on Yarmouth for each direction are located just east of Broadway.

The following text discusses specific TDM measures proposed within the context of site planning and programming:

Management and Parking Strategies:

- 198 standard, 82 compact, and 19 accessible parking spaces (299 total) are proposed on-site with the Block 1 parking garage and Block 1, 2, 3, and 4 off-street surface parking areas. There will also be 83 on-street parking spaces on-site for overflow and guests. The 299 on-site parking spaces represents a reduction of 76 spaces or 21% from the required 375 spaces per City of Boulder code. A total of 94 spaces are proposed within the Block 1 structured (below grade) parking.
    - It is proposed that the parking will be unbundled and will allow the tenants to choose whether or not to include parking in their lease/purchase agreement.

Facilities and Design:

- *Bicycle Parking*: Pursuant to section 9-9-6 (8)(g)(1), B.R.C. 1981, the project is required to provide 277 long-term, covered bike parking spaces and 99 short-term parking spaces (376 total). The site plan provides for 282 long-term, covered and 124 short-term bike parking spaces (406 total). Thus, the project exceeds the long-term, short-term, and total parking spaces required.

  The bicycle parking spaces are distributed throughout the site to service residents and visitors. See Site Review Submittal Sheet A-3.03 for additional information.

- *Bicycle Access:* Bicycle access to the site is provided for by on-street bicycle lanes along the Broadway, Lee Hill Drive, and Yarmouth Avenue. The design of the site will facilitate connections to these facilities.

- *Bicycle Amenities:* There will be bike racks on the North Armory site that will be located appropriately as shown on the site plan. A collective bike tool/repair spaces and storage for bike trailers will be provided near the long-term bike parking area.

- *Bus Shelter:* It is proposed that a bus shelter will be constructed on Broadway approximately 90 feet north of Zamia Avenue on the east side of the street. The shelter will be a custom design and include bike racks, a bench, and a trash receptacles.

- *On-Site Amenities:* The site has restaurant and retail space available, which will reduce off-site travel demands from the residents as well as encouraging non-auto trips from nearby, existing residential uses.

Incentives Strategies:

The applicant will implement an Employee Commute Trip Reduction Program to mitigate the impacts of the development on local traffic. This plan will include the following elements:

- *Employee Eco-Passes:* RTD Eco-Passes will be provided for the employees of the retail/restaurant uses.

- *Residential Eco-Passes:* RTD Eco-Passes will be provided for each apartment for a period of three years. The financial guarantee provided by the developer is as follows:

Year	Units	Pricing Zone A Cost/Unit*	Total
1	182	$98	$17,836
2	182	$108	$19,656
3	182	$119	$21,658
		Grand Total:	***$59,150***

** 10% of the cost is added in Year 2 and 3 to account for possible increases to Eco Pass prices*

For the 18 townhome units, Neighborhood Eco Pass (NECO) program participation is proposed; the developer will create a NECO Pass participation program sufficient for a period of three years for each of the 18 proposed units. Homeowners will reimburse the developer of the costs at the time of sale.

- *Transportation Information Center:* The applicant will maintain a Transportation Information Center at the worksite. This center can take a variety of forms, but must serve as means to providing employees with important travel information including transit maps and schedules, bicycle maps, local and regional marketing campaigns, and information on the commute benefits provided to employees.

- *eGo Carshare*: The project proposes to provide at least one parking space that will be reserved for an eGo Carshare vehicle.

- *B-Cycle Bike Share Program:* At this time the B-Cycle network does not extend to north Boulder. If the program is to expand to north Boulder in the future, this site may be a good candidate for a bike share station.

Marketing Strategies:

- *Walk and Bike Month* takes place in June and is organized by GO Boulder and Community Cycles, a local non-profit that promotes a culture of cycling in Boulder. For at least the first 2 years following its opening for business, the applicant will host a Bike to Work Day Breakfast Station and will actively encourage employees to register and participate in Bike to Work Day (June) or Winter Bike to Work Day (January).

- *Orientation packets*: Applicant will provide Go Boulder Orientation Packets to residents and employers that will include bus/bike maps and other information on transportation projects.

- *TDM Plan evaluation*: Applicant will facilitate the distribution of GO Boulder-provided periodic surveys of resident and employee travel behavior to evaluate the TDM Plan. The survey is designed to collect anonymous travel information and takes less than 10 minutes to complete.

/SGT

Traffic Assessment Memo

MEMORANDUM

To: City of Boulder Planning & Development Services

From: Steve Tuttle, PE, PTOE; Cassie Slade, PE

Date: March 19, 2016

Project: North Boulder Armory Redevelopment Project

Subject: Traffic Assessment - Revised

The North Boulder Armory redevelopment project is proposing to develop residential and retail/restaurant on the site of the former North Boulder Armory located at the southeast corner of Broadway & Lee Hill Drive. The site is bounded by Lee Hill Drive on the north, Broadway on the west, 14th Street on the east and existing residential use to the south. A Vicinity Map is shown on **Figure 1**.

The North Boulder Armory 8.5 ± acre site is includes two zoning designations: MU-1 (6.5-acres) and RMX-2 (2-acres). Land uses permitted by zoning and proposed by the project include multi-family attached (MFA) dwelling units (DU), townhomes, residential amenities and retail/restaurant uses. The project site is subdivided into four "blocks", with the following land uses proposed per block:

- Block #1 (MU-1) – 70 MFA DUs (rental – studio to 2-bedroom), 5,600 SF retail/restaurant, 9,496 SF redevelopment of the existing Armory building for residential amenities and leasing office
- Block #2 (MU-1) – 41 MFA DUs (rental – studio to 2-bedroom), 2,800 SF retail/restaurant
- Block #3 (MU-1 and RMX-2) – 25 MFA DUs (rental – studio to 2-bedroom), 8 townhome units (for-sale)
- Block #4 (MU-1 and RMX-2) – 46 MFA DUs (rental – 1-bedroom to 2-bedroom), 10 townhome units (for-sale)

The project represents a total of 200 DUs and 8,400 SF retail/restaurant use. The site will access the existing roadways as listed: one access on Broadway, one on Lee Hill Drive, one on Yellow Pine Avenue, and one on 14th Street. There will be five internal intersections created with the proposed extension of 13th Street and Zamia Avenue. All accesses and internal intersections are anticipated to be full-movement, side-street stop-controlled. There is adequate circulation opportunities for pedestrians and bicyclists throughout the site and connection to the existing facilities.

In accordance with the City of Boulder site review process, an initial Traffic Assessment is required which includes an analysis of trip generation, distribution, and trip reduction assumptions for the project. This memorandum summarizes this analysis for the subject project.

Trip Generation

To establish the volume of new trips that will be added to the area roadway network with redevelopment of the site, trip generation estimates for the proposed site uses were calculated based on rates contained in the Institute of Transportation Engineers (ITE) trip generation manual.

The trip generation estimates are summarized on **Table 2** for weekday daily, weekday AM, and weekday PM periods. As shown on **Table 2**, the proposed development represents an increase in daily and hourly traffic to the adjacent roadway network.

Auto Trip Reductions

The project is located in a mixed-use environment and will take advantage of nearby pedestrian, bicycle, and transit connections. Broadway serves as major transit corridor with the Y, 204 and SKIP routes served directly adjacent to the site. Both Broadway and Lee Hill Drive have bicycle lanes to provide bicycle connectivity and access to city and regional facilities. Given the projected mixed use, nearby mixed use, and multimodal connectivity, it is anticipated that there will be significant non-auto trips associated with the site. These non-auto trips will represent a reduction from the standard ITE trip rates, which are based on studies in predominantly suburban locations that have low non-auto mode use.

For the purposes of providing a conservative analysis of site traffic impacts, we have assumed a non-auto trip reduction of 20% to account for the site's location. The 20% non-auto use reduction is reflected on **Table 2** for the proposed uses.

Trip Types

Due to the nature of the retail/restaurant land uses proposed for the project and on adjacent, connected parcels, a percentage of the automobile traffic entering and exiting the site will likely be "pass-by" and "diverted" traffic from the adjacent roadway traffic flows. This traffic currently exists on the adjacent street network and will therefore not be considered "new" traffic to the overall region. The following describes the types that will be evaluated for this study:

- *Primary Trips*. These trips are made specifically to visit the site and are considered "new" trips. Primary trips would not have been made if the proposed project did not exist. Therefore, this is the only trip type that increases the total number of trips made on a regional basis.

- *Pass-By Trips*. These retail related trips already exist on the roadways directly adjacent to the project site. Pass-by trips do not create any increase in the traffic volumes within the primary impact area. The only impact of the pass-by trips occurs at the site driveways and adjacent intersections where through movements become turning movements into and out of the site.

Therefore, pass-by trips have no additional impact on the road system beyond the site's driveways or immediately adjacent intersections. .

- *Multi-Use Trips*. These internal trips occur from one land use or building to another within the site boundaries. For example, a person may patronize a retail use and restaurant in one "trip". Multi-use or multi-purpose trips do not affect the exterior site access points, nor add any additional traffic volumes to the adjacent street network. Multi-use trips are accounted for within the 20% non-auto use reduction as it is assumed that these trips would occur without the person moving their vehicle.

Given the relatively small amount of retail/restaurant space for this project (8,400 SF), pass-by traffic was not assumed to reduce the unique trip generation for this site. This provides a higher, more conservative estimate of site traffic impacts.

Proposed Access

The project proposes to construct streets and access consistent with the existing street grid in the area. Full movement access to the site is proposed at the following locations:

- Extension of Zamia Avenue through the site to intersect at Broadway and at 14th Street
- Extension of 13th Street through the site to intersect at Lee Hill Drive
- Connectivity to the south via the proposed 13th Street extension

Site Trip Distribution

Site trips will be distributed onto the study area roadway network as shown on **Figure 6**. The distribution percentages are based on regional land use destinations, existing travel patterns, and other area traffic studies.

Traffic Impact Study

Per the procedures outlined in the City of Boulder Design and Construction Standards, a full Traffic Impact Study will be required for this project. This traffic assessment serves as a basis for the trip generation and distribution assumptions that will be incorporated into the Traffic Impact Study.

Travel Demand Management

A Travel Demand Management (TDM) Plan will be required by the City which outlines strategies to mitigate traffic impacts created by the proposed development and implementable measures for promoting alternate modes of travel. This will be provided with the Traffic Impact Study.

Initial TDM strategies being proposed or evaluated by the applicant include the following:

- Secured, covered bicycle parking
- Bicycle parking for retail and residential uses in excess of City code requirements
- Employee and resident Eco Passes
- Carshare and bikeshare programs
- Residential transportation orientation packs
- TDM program evaluation
- Enhanced site infrastructure to support non-auto use
- Unbundled parking

/SGT

Attachments:

Figure 1 – Vicinity Map
Figure 6 – Site Trip Distribution
Table 2 – Trip Generation Summary