Traffic Impact Study

Parker and Pine

Parker, Colorado

Prepared for:

Eisenberg Company

Kimley»Horn

T R A F F I C I M P A C T S T U D Y

Parker and Pine

Parker, Colorado

Prepared for
Eisenberg Company
2710 E Camelback Rd #210
Phoenix, AZ 85016

Prepared by
Kimley-Horn and Associates, Inc.
4582 South Ulster Street
Suite 1500
Denver, Colorado 80237
(303) 228-2300

October 2019

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 EXECUTIVE SUMMARY

A new mixed-use development, Parker and Pine, is proposed on the southwest corner of the Pine Lane and Parker Road (SH-83) intersection, in Parker, Colorado. For purposes of this traffic study, the project was assumed to include 175 multifamily residential units, a 13,000 square foot day care center, 17,000 square feet of retail, 6,000 square feet of fast-food restaurants, a 16-fueling position gas station with convenience market, and a 6,900 square foot automated car wash. It is expected that the project will be completed within the next few years. Analysis was therefore conducted for the 2022 short term horizon, as well as the 2040 long-term horizon per Town of Parker and State of Colorado Department of Transportation (CDOT) requirements.

The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. The following intersections were incorporated into this traffic study in accordance with Town of Parker and CDOT standards and requirements:

- Pine Lane and Parker Road (SH-83)
- Pine Lane and Twenty Mile Road

In addition, the proposed right-in/right-out access along Parker Road, the proposed full movement access along Pine Lane, and the proposed full movement access along Twenty Mile Road were evaluated.

Regional access to the site will be provided by Parker Road (SH-83) and E-470. Primary access to the site will be provided by Parker Road and Pine Lane. Direct access to the project is proposed from one access on Pine Lane, one access on Parker Road, and one access on Twenty Mile Road. The proposed driveway along Pine Lane is located approximately 550 feet west of Parker Road. The proposed access along Parker Road is located approximately 500 feet south of Pine Lane. The proposed driveway access along Twenty Mile Road is located approximately 500 feet south of Pine Lane. All access curb cuts have already been constructed in these locations.

The Parker and Pine Development is expected to generate approximately 7,194 daily external weekday trips. Of these, 645 trips are expected to occur during the weekday morning peak hour, while 572 trips are expected during the weekday afternoon peak hour. Since the project is a commercial development, pass-by trips are expected. These pass-by trips are vehicles already on the street network that will be attracted to the retail, gas station, and fast-food restaurants. With pass-by, expected net new trips (non pass-by) to the surrounding street network results in 4,720 weekday daily trips with 442 and 396 trips anticipated during the weekday morning and afternoon peak hours, respectively.

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, anticipated surrounding development areas, and the proposed access system for the project. Assignment of project traffic was based upon the trip generation described previously and the distributions developed.

Based on the analysis presented in this report, Kimley-Horn believes the proposed Parker and Pine project will be successfully incorporated into the existing roadway network. The proposed project development and expected traffic volumes resulted in the following recommendations:

- The threshold for requiring an access permit along CDOT roadways occurs when project traffic is anticipated to increase the existing access traffic volumes by more than 20 percent. Based on traffic projections, the addition of project traffic on the west leg of Pine Lane at Parker Road (SH-83) is anticipated to increase existing access traffic volumes by more than 20 percent during the peak hour; therefore, it is believed that an access permit for the west leg of Pine Lane at SH-83 will be required by CDOT in association with this project. In addition, an access permit will also be required for the proposed right-in/right-out driveway access along Parker Road.

- It is recommended that the project access along Pine Lane allow full turning movements and that the project access approach be stop controlled with installation of a R1-1 “STOP” sign for the northbound approach to Pine Lane. The project access approach to Pine Lane provide a throat depth to accommodate two vehicles of storage (50 feet).

- It is recommended that the project access along Parker Road (SH-83) be restricted to right-in/right-out movements and that the project access be stop controlled with installation of a R1-1 “STOP” sign for this eastbound access approach to Parker Road. To identify the proposed access to right turn movements only, it is recommended that a with a R3-2 No Left Turn sign be placed underneath the “STOP” sign and a R6-1 (R) “ONE WAY” sign be located within the existing raised median directly in front of the driver’s view from the access to further identify the exiting movement at the driveway for right turns only.

- It is recommended that the project access along Twenty Mile Road allow full turning movements and that the project access approach be stop controlled. A R1-1 “STOP” sign should be installed for the westbound approach to Twenty Mile Road. The project access approach is recommended to provide a throat depth to accommodate one vehicle of storage (25 feet).

- With development of the project, it is recommended the westbound left turn lane at the Pine Lane and Twenty Mile Road intersection be restriped to include 200-foot dual left turn lanes.

- With development of the project, it is recommended the eastbound left turn lane length at the Pine Lane and Parker Road (SH-83) intersection be extended to its maximum possible length from the existing 175 feet to 250 feet. This will require restriping of Pine Lane by modifying the turn bay taper.

- By 2040, the Pine Lane and Parker Road (SH-83) intersection was found to have operational issues if the background traffic volumes are realized. Therefore, to provide the most optimal traffic lanes available, the northbound left turn at the Pine Lane and Parker Road (SH-83) intersection may need to be expanded to include dual left turn lanes. An area is striped out for these dual left turn lanes already (to shadow the southbound dual lefts) so implementation of northbound dual lefts is feasible. Further, and as identified in the Parker Road Corridor Plan, Parker Road may need to provide four through lanes in each direction within the project limits. The existing northbound and southbound right turn lanes at the Pine Lane and Parker Road intersection would be converted to shared through/right turn lanes. The four southbound lanes will extend from the Eastbound E-470 Off Ramp to Lincoln

Avenue while four northbound through lanes will extend from the south of Lincoln Avenue to the Westbound E-470 On Ramp.

- All off-site and on-site improvements should be incorporated into the Civil Drawings, and conform to standards of the Town of Parker, CDOT, American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, Institute of Transportation Engineers (ITE), and the Manual on Traffic Control Devices (MUTCD) – 2009 Edition.

2.0 INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) has prepared this report to document the results of a Traffic Impact Study of future traffic conditions associated with the proposed Parker and Pine mixed-use development to be located on the southwest corner of the Pine Lane and Parker Road (SH-83) intersection in Parker, Colorado. A vicinity map illustrating the project site location is shown in **Figure 1**. The project is anticipated to develop with 175 multifamily residential units, a 13,000 square foot day care center, 17,000 square feet of retail, 6,000 square feet of fast-food restaurants, a 16-fueling position gas station with convenience market, and a 6,900 square foot automated car wash. It is expected that the project will be completed within the next few years. Analysis was therefore conducted for the 2022 short term horizon, as well as the 2040 long-term horizon per Town of Parker and State of Colorado Department of Transportation (CDOT) requirements. The conceptual site plan illustrating the development and access locations is shown in **Appendix G**.

The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. The following intersections were incorporated into this traffic study in accordance with Town of Parker and CDOT standards and requirements:

- Pine Lane and Parker Road (SH-83)
- Pine Lane and Twenty Mile Road

In addition, the proposed right-in/right-out access along Parker Road, the proposed full movement access along Pine Lane, and the proposed full movement access along Twenty Mile Road were evaluated. The Town of Parker Traffic Impact Study Checklist is provided in **Appendix A**.

NORTH
NTS 096502001

PARKER AND PINE
PARKER ROAD & PINE LANE
VICINITY MAP

FIGURE 1

Kimley»Horn

3.0 EXISTING AND FUTURE CONDITIONS

3.1 Existing and Future Study Area

The existing site is comprised of vacant land. The surrounding area contains a mix of uses. Directly to the north of the site exists a medical office building. Directly to the east across Parker Road is retail and a motel. Directly to the west is vacant land and the Baldwin Gulch Trail which runs along the southern border of the site. Directly to the south are commercial uses. Outside of these uses, a K-8 charter school exists to the southwest and residential areas exist to the west. The site area is shown in **Figure 2**.

3.2 Existing Roadway Network

Regional access to the site will be provided by Parker Road (SH-83) and E-470. Primary access to the site will be provided by Parker Road and Pine Lane. Direct access to the project is proposed from one access on Pine Lane, one access on Parker Road, and one access on Twenty Mile Road. The proposed driveway along Pine Lane is located approximately 550 feet west of Parker Road. The proposed access along Parker Road is located approximately 500 feet south of Pine Lane. The proposed driveway access along Twenty Mile Road is located approximately 500 feet south of Pine Lane. All access curb cuts have already been constructed in these locations.

Parker Road provides three through lanes of travel each direction, northbound and southbound, and has a posted speed limit of 45 miles per hour. Parker Road has a fourth auxiliary lane northbound and southbound and is separated by a raised median through the project study area. Pine Lane provides two lanes of travel each direction, eastbound and westbound, and has a posted speed limit of 40 miles per hour. Twenty Mile Road provides two lanes of travel each direction, northbound and southbound, and has a posted speed limit of 40 miles per hour. Twenty Mile Road is separated by a raised median through the project study area.

The intersection of Pine Lane and Parker Road is signalized with protected only left turn phasing on all approaches. The eastbound and westbound approaches each consist of dual left turn lanes, two through lanes, and channelized right turn lanes operating with free turning movements. The northbound approach consists of a left turn lane, three through lanes and a channelized right turn lane operating with yield control, while the southbound approach includes

dual left turn lanes, three through lanes, and channelized right turn lanes operating with yield control.

The intersection of Pine Lane and Twenty Mile Road is signalized with protected-permissive left turn phasing on all approaches. All four approaches of this intersection include a left turn lane, two through lanes, and a right turn lane. However, the eastbound and northbound approaches do not provide storage for the right turn movement. The intersection lane configuration and control for these study area key intersections are shown in **Figure 3**.

3.3 Existing Traffic Volumes

Existing peak hour turning movement counts were conducted at the key intersections on Tuesday, October 1, 2019. The counts were conducted in 15-minute intervals during the morning and afternoon peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. Existing turning movement counts are shown in **Figure 4** with count sheets provided in **Appendix B**.

3.4 Unspecified Development Traffic Growth

According to information provided on the website for the Colorado Department of Transportation, the 20-year growth factor along Parker Road (SH-83) within the study area has a range of 1.25 to 1.27. This value equates to an annual growth rate of approximately 1.12 percent and 1.20 percent, respectively. According to the Douglas County 2030 Transportation Plan (2020 & 2030 peak hour traffic forecasts) Parker Road through the study area has an annual projected growth rate of 0.7 percent. Therefore, an annual traffic volume growth rate of 1.20 percent was used in this traffic analysis to be conservative. Traffic information from the CDOT Online Transportation Information System (OTIS) website and Douglas County 2030 Transportation Plan traffic forecast maps are included in **Appendix C**. This annual growth rate was used to estimate near term 2022 and long term 2040 traffic volume projections at the key intersections. Background traffic volumes for 2022 and 2040 are shown in **Figures 5** and **6**, respectively.

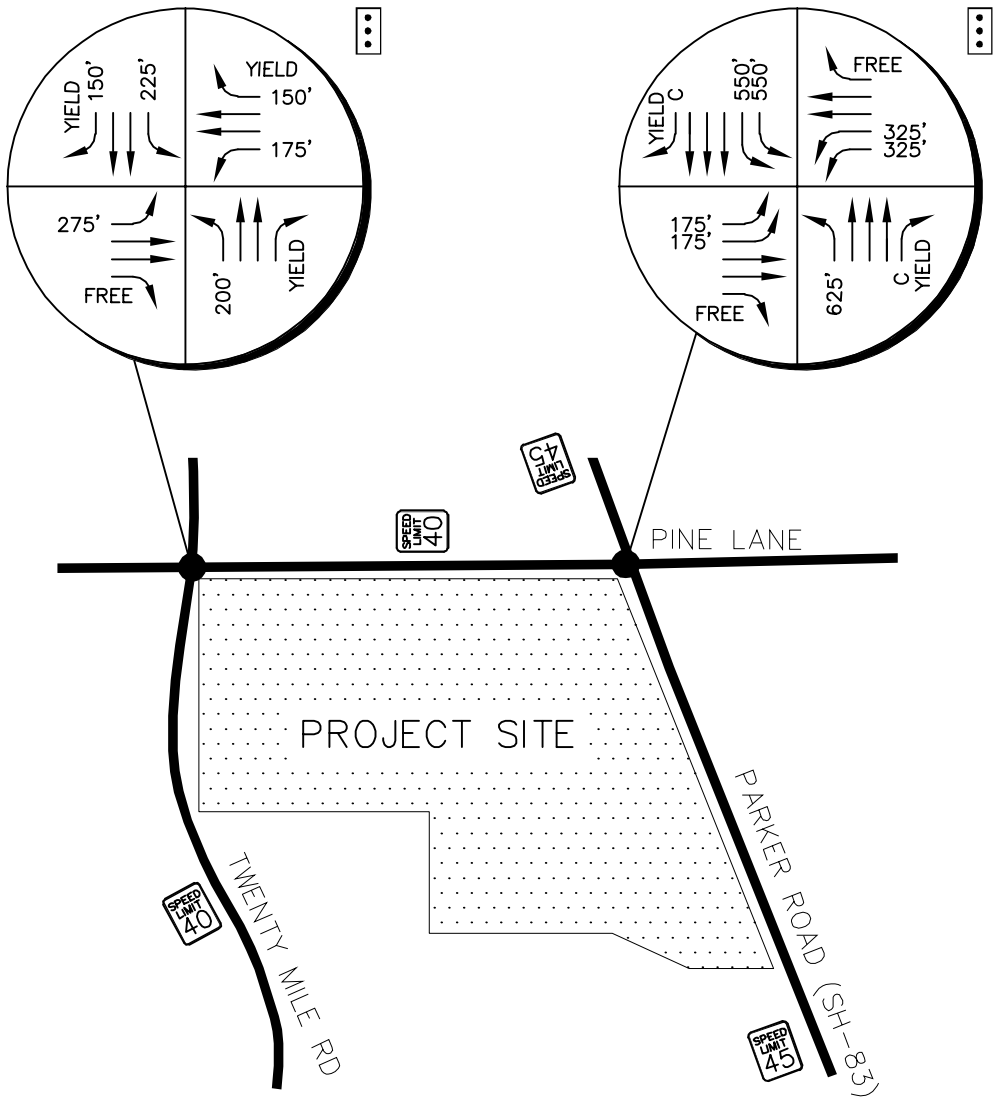
Kimley»Horn
NORTH
NTS 096502001

PARKER AND PINE
PARKER ROAD & PINE LANE
SITE AREA

FIGURE 2

Kimley»Horn

Kimley»Horn
NORTH
NTS 096502001



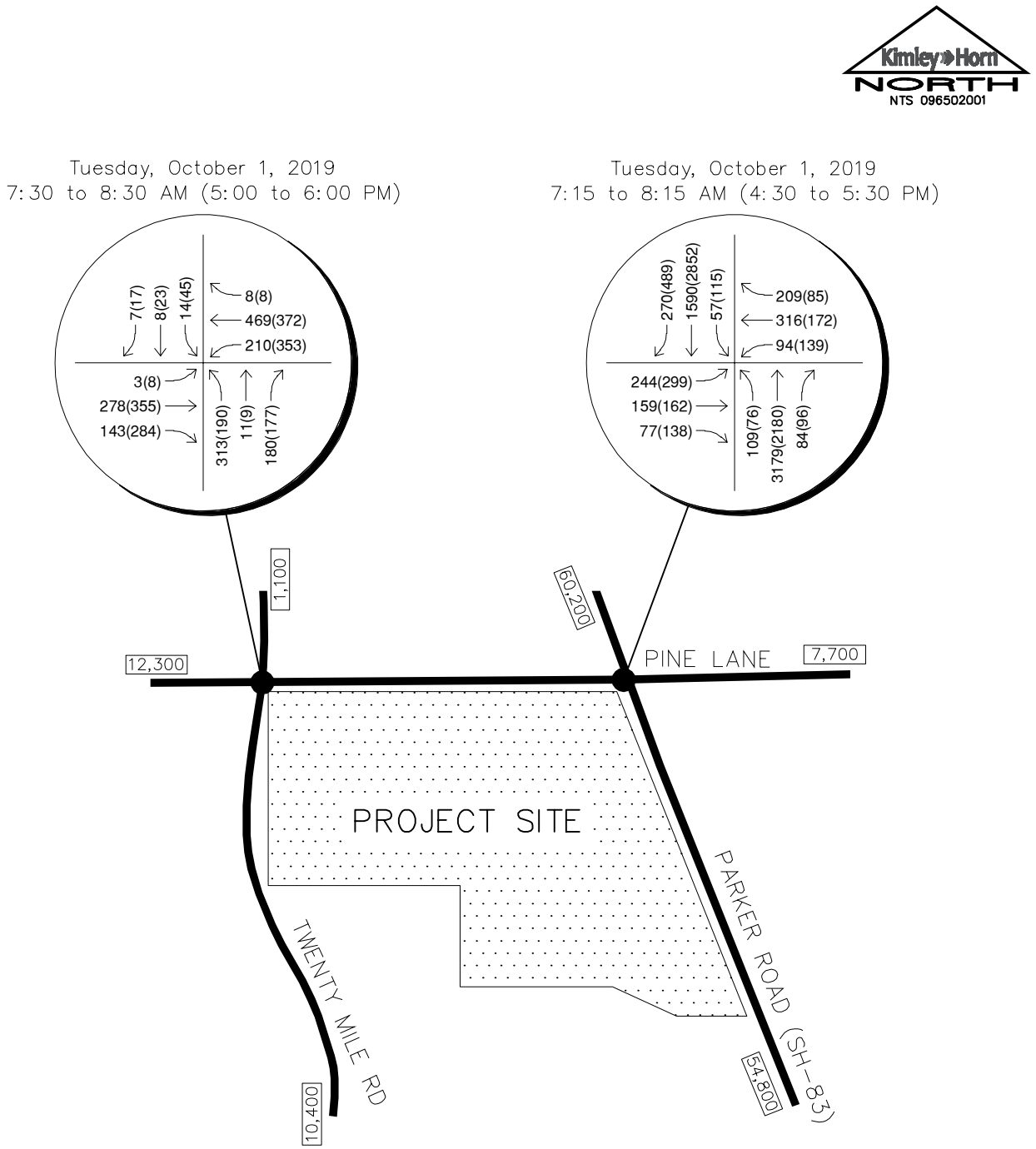
LEGEND

- Study Area Key Intersection
- Signalized Intersection
- STOP Stop Controlled Approach
- SPEED LIMIT XX Roadway Speed Limit
- 100' Turn Lane Length (feet)

PARKER AND PINE
PARKER ROAD & PINE LANE
EXISTING LANE CONFIGURATIONS

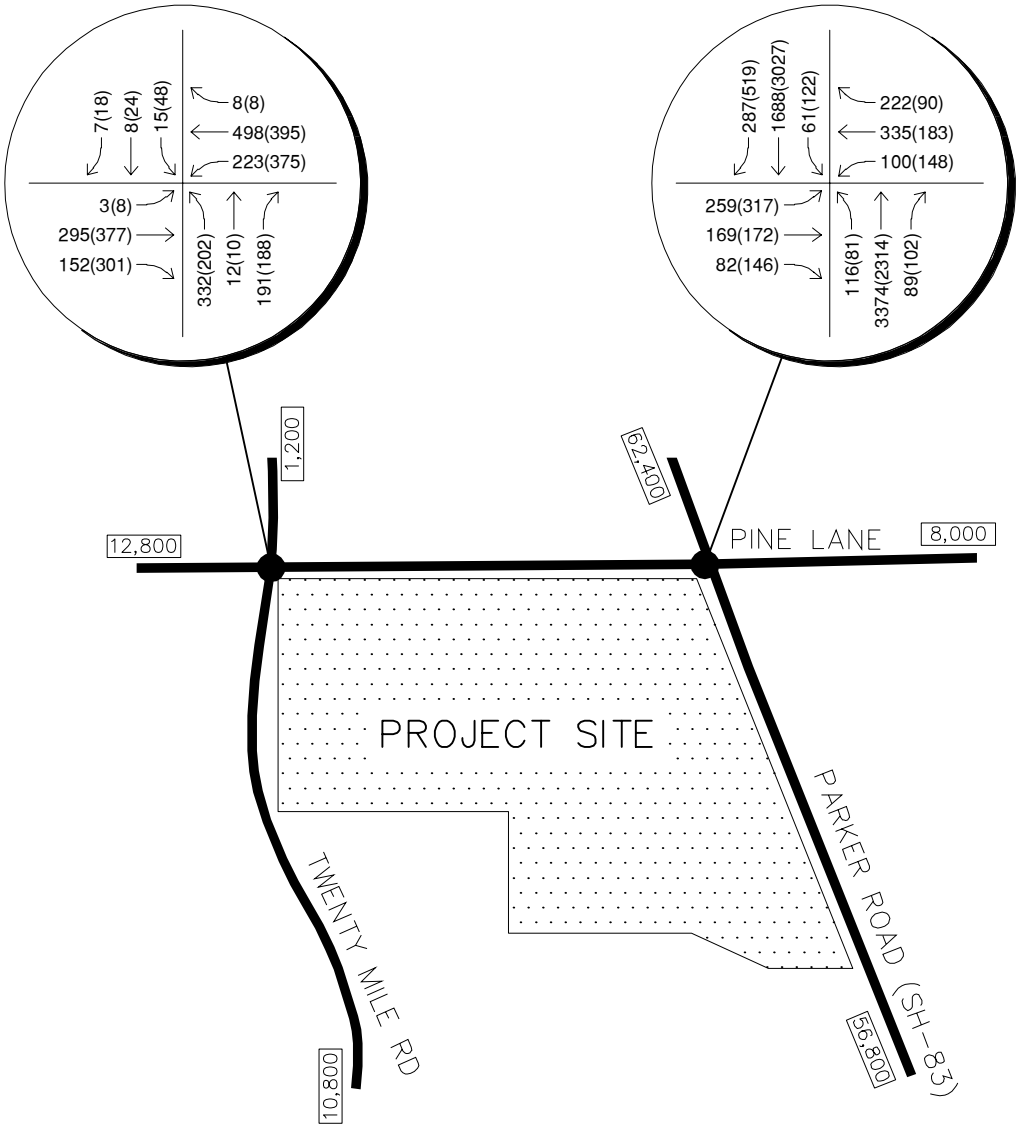
FIGURE 3

Kimley»Horn



PARKER AND PINE
PARKER ROAD & PINE LANE
EXISTING TRAFFIC VOLUMES

FIGURE 4



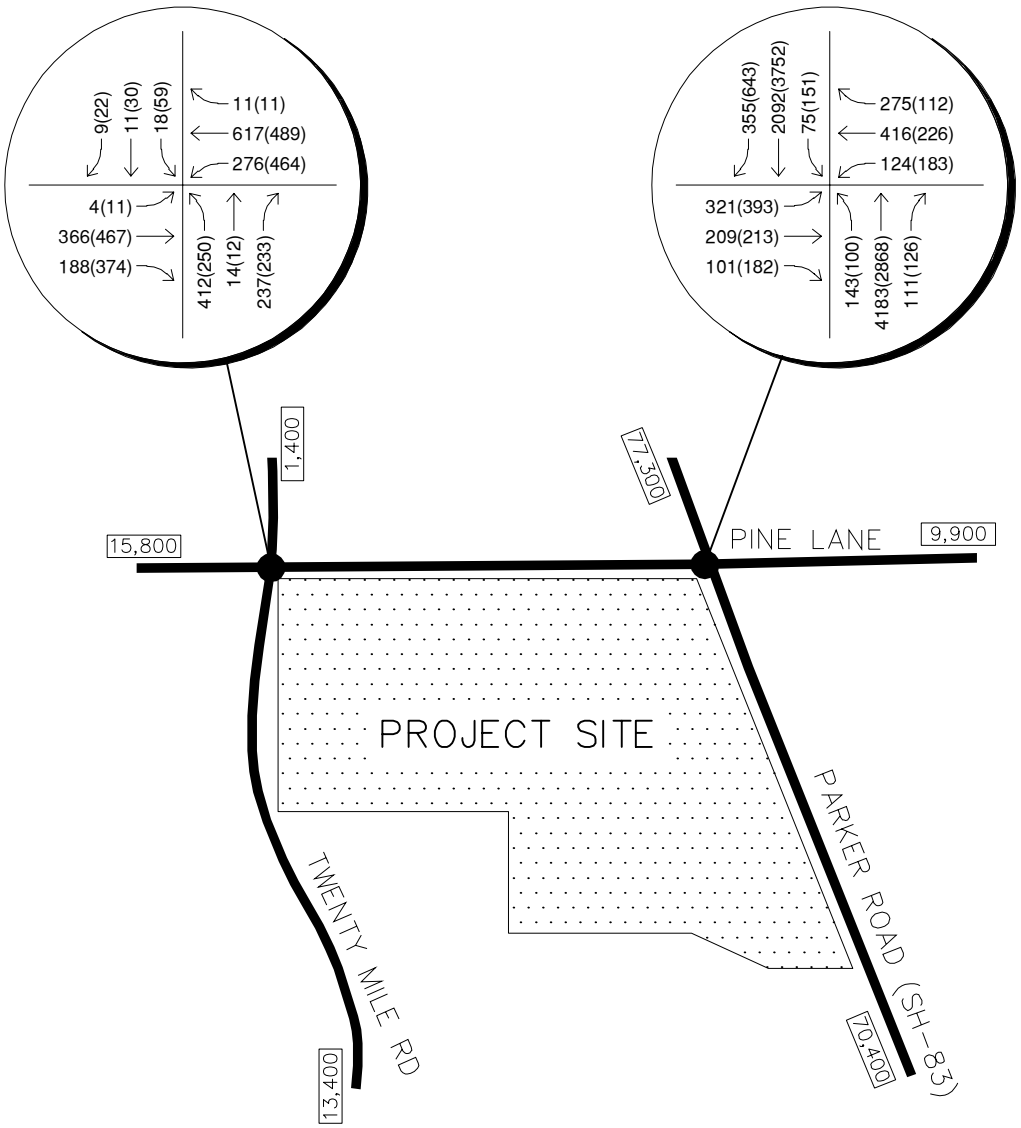
LEGEND

- Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

PARKER AND PINE
PARKER ROAD & PINE LANE
2022 BACKGROUND TRAFFIC VOLUMES

FIGURE 5

Kimley»Horn



LEGEND

- Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

PARKER AND PINE
PARKER ROAD & PINE LANE
2040 BACKGROUND TRAFFIC VOLUMES

FIGURE 6

Kimley»Horn

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land uses to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*[1] published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, Kimley-Horn used the ITE Trip Generation Report regression equations and average rates that apply to Mid-Rise Multifamily Housing (ITE Code 221), Day Care Center (ITE 565), Shopping Center (ITE 820), Fast Food Restaurant with Drive Through (ITE 934), Gasoline Station with Convenience Market (ITE 945), and Automated Car Wash (ITE 948) for traffic associated with the Parker and Pine development.

Since a mix of uses is proposed within the same development, it is anticipated that traffic will be shared between each use. This internal trip generation, or capture, is expected to occur between the various retail and residential uses. Therefore, the ITE internal capture procedure was used to determine the amount of traffic that may be shared between uses, which thereby determines the number of external trips. The internal capture methodology and procedure as well as the pass-by percentages for each use were obtained from the ITE *"Trip Generation Manual, Tenth Edition, Users Guide and Handbook" 2017.* Based on this, the proposed development is expected to generate approximately 7,194 daily external weekday trips. Of these, 645 trips are expected to occur during the weekday morning peak hour, while 572 trips are expected during the weekday afternoon peak hour.

Since the project is a commercial development, pass-by trips are expected. These pass-by trips are vehicles already on the street network that will be attracted to the retail, gas station, and fast-food restaurants. Since this project development area is located along Parker Road, with a gas station/convenience market and fast food restaurants proposed, it is believed that the ITE percentages for pass-by are more accurate than the Town prescribed 15 percent pass-by percentage. Therefore, based on this project's location, the ITE pass-by rates were used in the

[1] Institute of Transportation Engineers, *Trip Generation: An Information Report*, Ninth Edition, Washington DC, 2012.

calculations. Of note, pass-by traffic volumes were captured primarily from Parker Road, so this traffic is counted as new traffic along Pine Lane and Twenty Mile Road at the proposed accesses as applicable. With pass-by, expected net new trips (non pass-by) to the surrounding street network results in 4,720 weekday daily trips with 442 and 396 trips anticipated during the weekday morning and afternoon peak hours, respectively. The pass-by percentages for each use were obtained from the ITE *"Trip Generation Manual, Tenth Edition, Users Guide and Handbook" 2017*. **Table 1** summarizes the estimated trip generation for the proposed Parker and Pine development. The trip generation worksheets are included in **Appendix D**.

Table 1 – Parker and Pine Traffic Generation

Land Use	Quantity	Daily Trips	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Total Trips								
Mid-Rise Multifamily Residential (ITE 221)	175 Units	952	15	44	59	46	30	76
Day Care Center (ITE 565)	13,000 SF	620	74	69	143	68	77	145
Shopping Center (ITE 820)	17,000 SF	642	10	6	16	31	34	65
Fast Food Restaurant w/ D.T. (ITE 934)	6,000 SF	2,826	123	118	241	102	94	196
Gas Station w/ Convenience (ITE 945)	16 Positions	3,286	102	98	200	114	110	224
Automated Car Wash (ITE 948)	6,900 SF	970	49	49	98	49	49	98
Total	-	9,296	373	384	757	410	394	804
Total Trips After Internal Capture (ITE Methodology)								
Mid-Rise Multifamily Residential (ITE 221)	175 Units	576	14	35	49	18	11	29
Day Care Center (ITE 565)	13,000 SF	530	69	60	129	55	62	117
Shopping Center (ITE 820)	17,000 SF	548	9	5	14	24	28	52
Fast Food Restaurant w/ D.T. (ITE 934)	6,000 SF	1,908	85	100	185	66	48	114
Gas Station w/ Convenience (ITE 945)	16 Positions	2,804	95	85	180	91	90	181
Automated Car Wash (ITE 948)	6,900 SF	828	45	43	88	39	40	79
Total	-	7,194	317	328	645	293	279	572
Non Pass-By Trips								
Mid-Rise Multifamily Residential (ITE 221)	175 Units	288	14	35	49	18	11	29
Day Care Center (ITE 565)	13,000 SF	212	69	60	129	55	62	117
Shopping Center (ITE 820)	17,000 SF	368	9	5	14	16	18	34
Fast Food Restaurant w/ D.T. (ITE 934)	6,000 SF	1,338	43	51	94	33	24	57
Gas Station w/ Convenience (ITE 945)	16 Positions	1,794	36	32	68	40	40	80
Automated Car Wash (ITE 948)	6,900 SF	720	45	43	88	39	40	79
Total	-	4,720	216	226	442	201	195	396
Pass-By Trips								
Shopping Center (ITE 820)	17,000 SF	180	0	0	0	8	10	18
Fast Food Restaurant w/ D.T. (ITE 934)	6,000 SF	570	42	49	91	33	24	57
Gas Station w/ Convenience (ITE 945)	16 Positions	1,010	59	53	112	51	50	101
Total	-	2,474	101	102	203	92	84	176

4.2 Trip Distribution

Distribution of site traffic was based on the area street system characteristics, existing traffic patterns and volumes, existing demographic information, and the proposed access system for the project. The non-pass-by directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source direction. **Figure 7** illustrates the expected non pass-by trip distribution for the site.

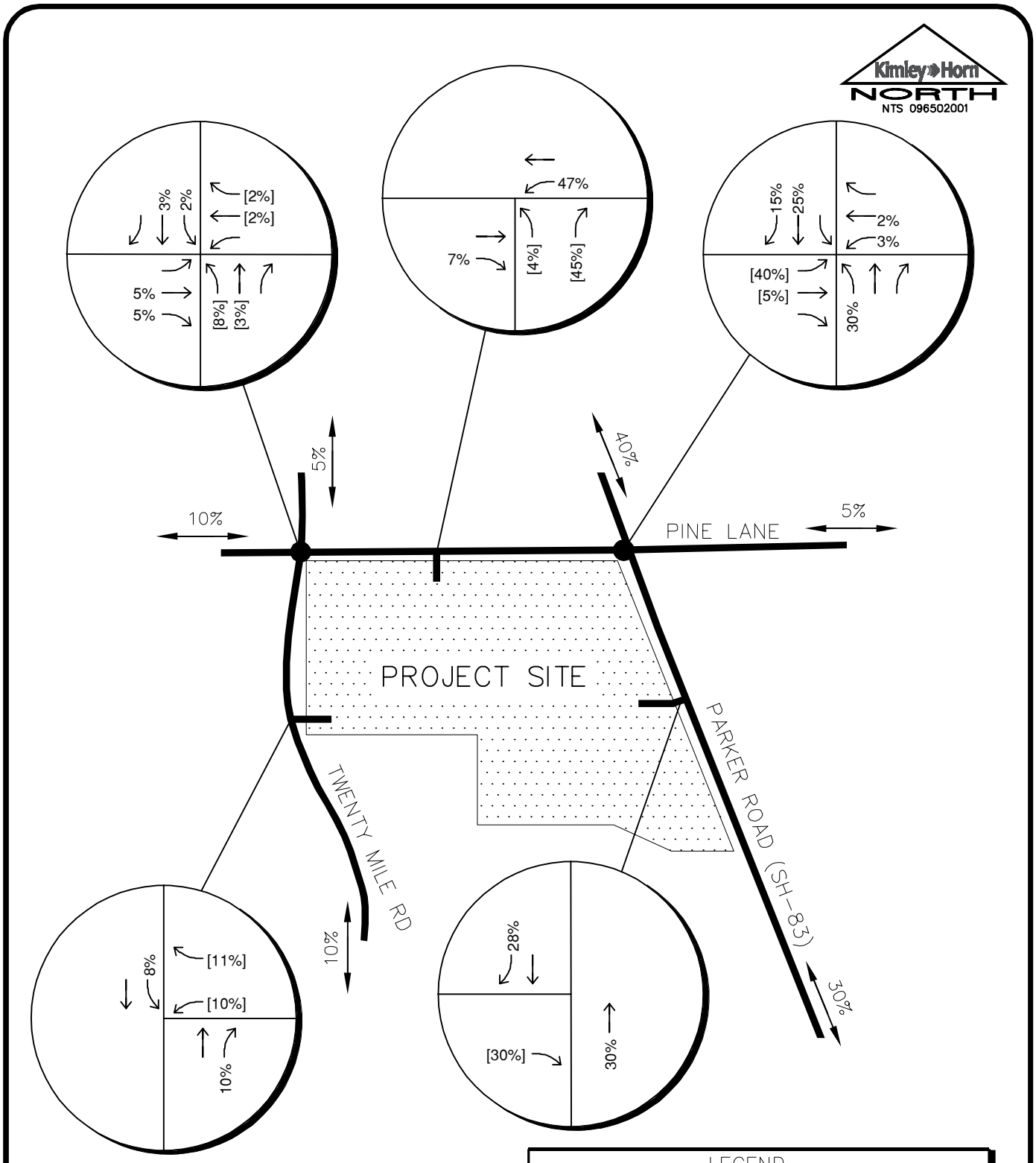
Due to the nature of the proposed uses, both new (non-pass-by) and pass-by trips are anticipated to be generated by this project. Pass-by distributions capture the route of the vehicle, which is a percentage of traffic driving by the site, arriving from a direction and then continuing in that original direction when leaving. Pass-by distributions are prepared directly based on existing traffic volume counts along the adjacent streets. **Figures 8** and **9**, illustrate the pass-by traffic, calculated separately for the morning and afternoon peak hours, respectively, due to the directional differences of traffic during these peak hours.

4.3 Traffic Assignment

Traffic assignment was obtained by applying the distributions from **Figures 7** through **9** to the estimated traffic generation of the project shown in **Table 1**. The non-pass-by traffic assignment is shown in **Figure 10**. Pass-by traffic assignment is shown in **Figure 11**.

4.4 Total (Background Plus Project) Traffic

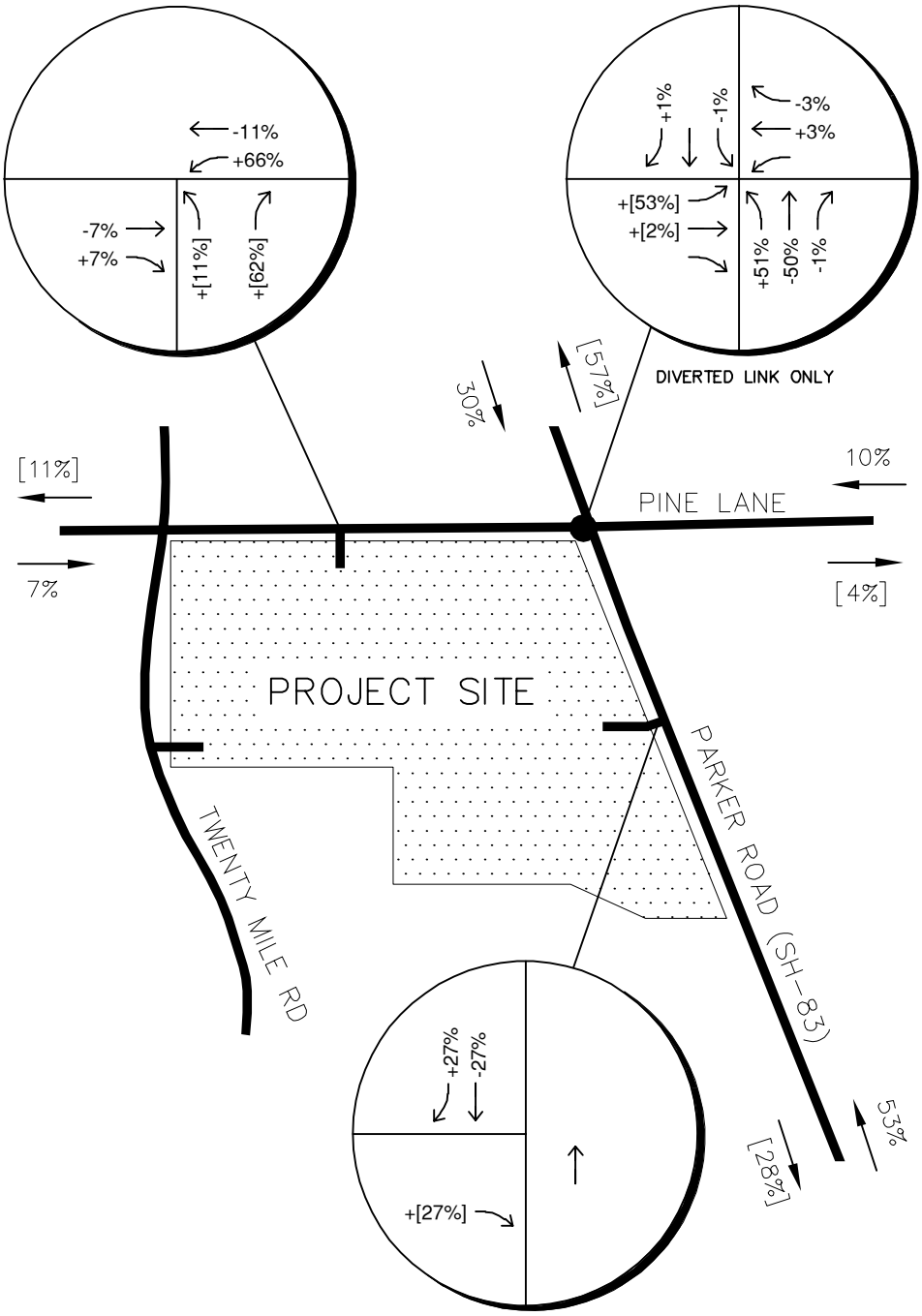
The project traffic volumes were added to the background volumes to represent estimated traffic conditions for the short term 2022 project build out horizon and long term 2040 horizon. **Figure 12** illustrates the background plus project traffic volumes for the 2022 horizon at the study key intersections and the access intersections proposed with the project. The 2040 background plus project traffic volumes are shown in **Figure 13**.



PARKER AND PINE
PARKER ROAD & PINE LANE
PROJECT TRIP DISTRIBUTION

FIGURE 7

Kimley»Horn



LEGEND

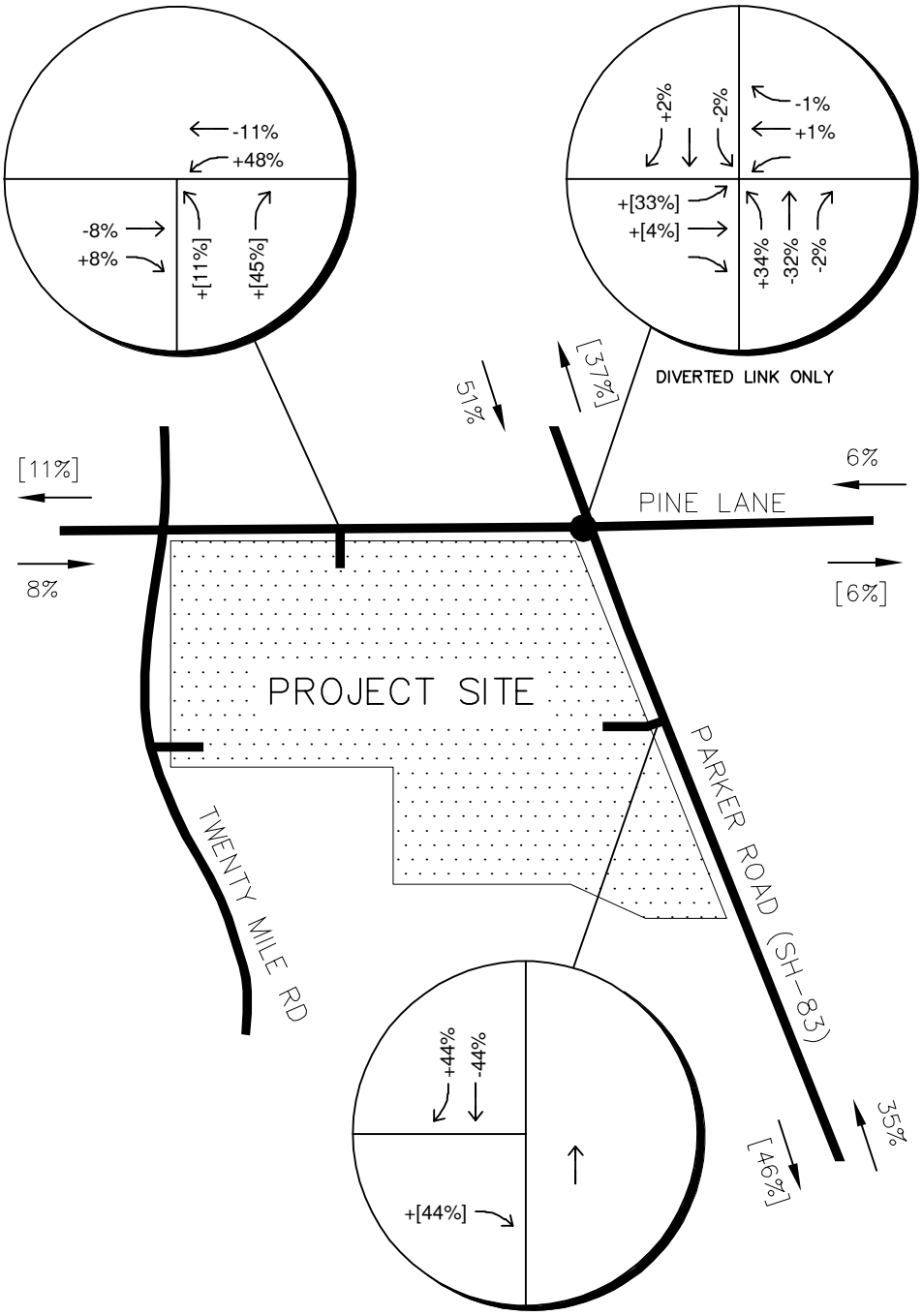
● Study Area Key Intersection

XX%[XX%] Entering[Exiting] Trip Distribution Percentage

PARKER AND PINE
PARKER ROAD & PINE LANE
AM PEAK PASS-BY TRIP DISTRIBUTION

FIGURE 8

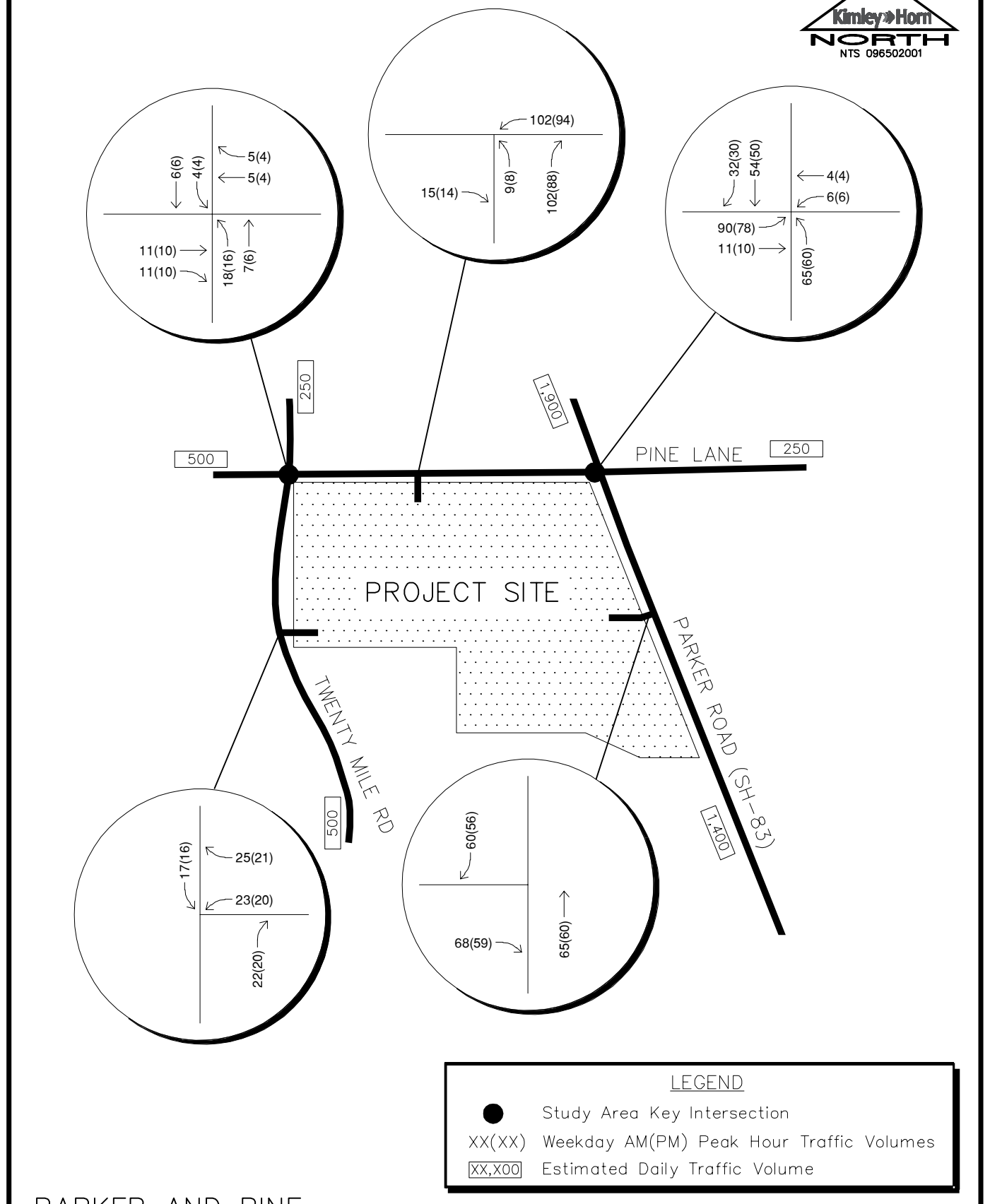
Kimley»Horn



PARKER AND PINE
PARKER ROAD & PINE LANE
PM PEAK PASS-BY TRIP DISTRIBUTION

FIGURE 9

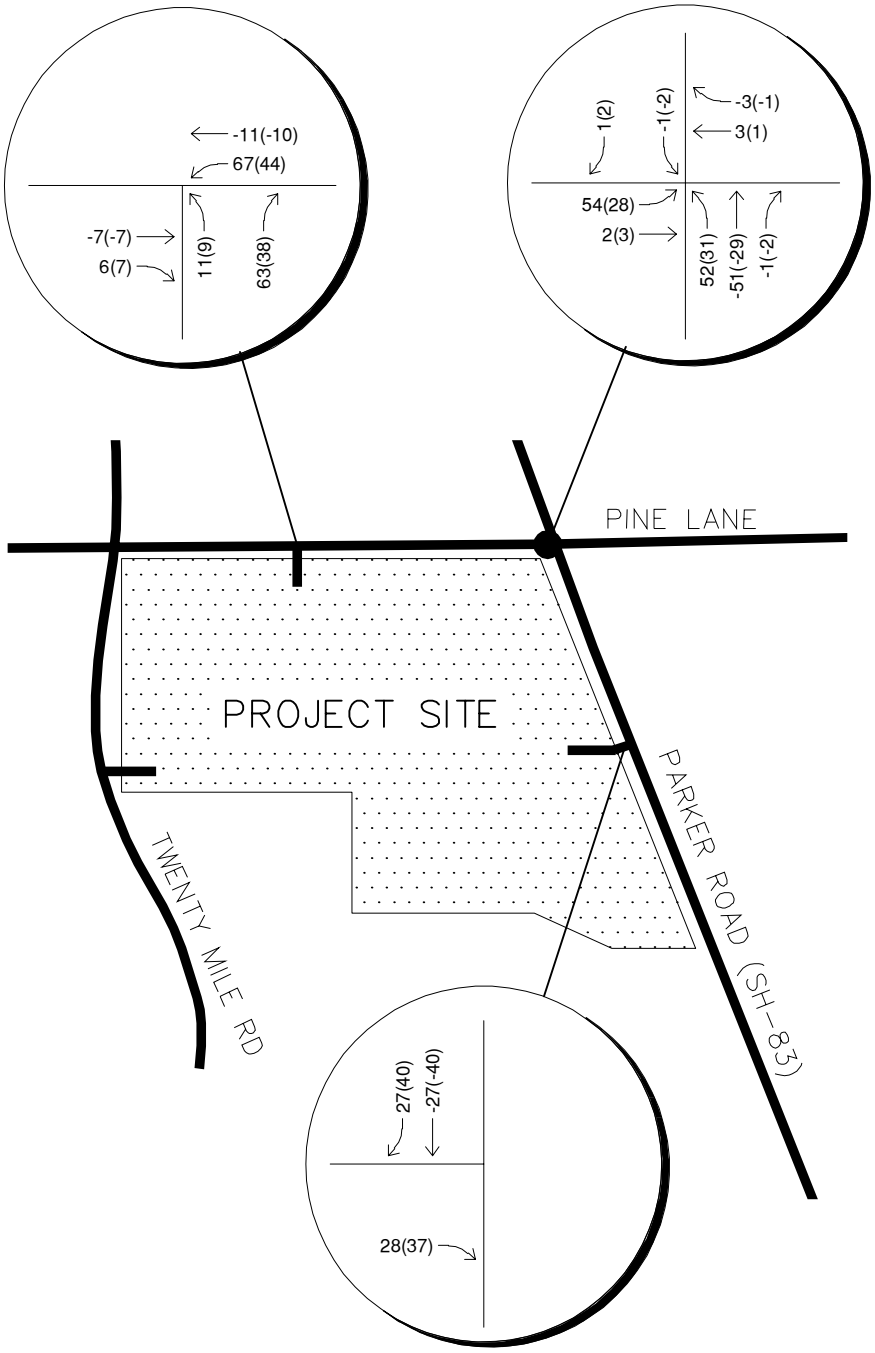
Kimley»Horn



PARKER AND PINE
PARKER ROAD & PINE LANE
NON PASS-BY TRAFFIC ASSIGNMENT

FIGURE 10

Kimley»Horn



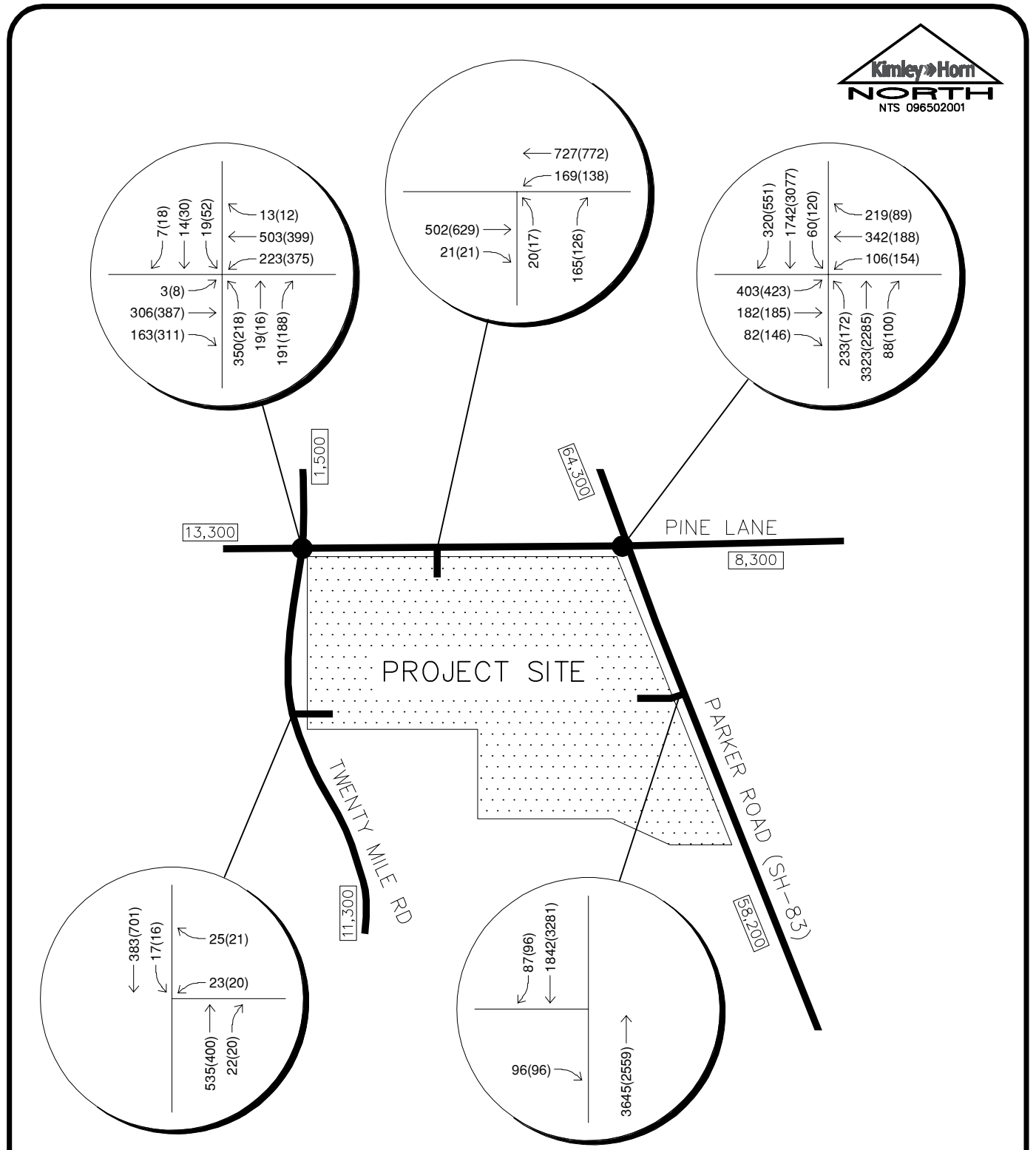
LEGEND

● Study Area Key Intersection

XX(XX) Weekday AM(PM) Peak Hour Traffic Volumes

PARKER AND PINE
PARKER ROAD & PINE LANE
PASS-BY TRAFFIC ASSIGNMENT

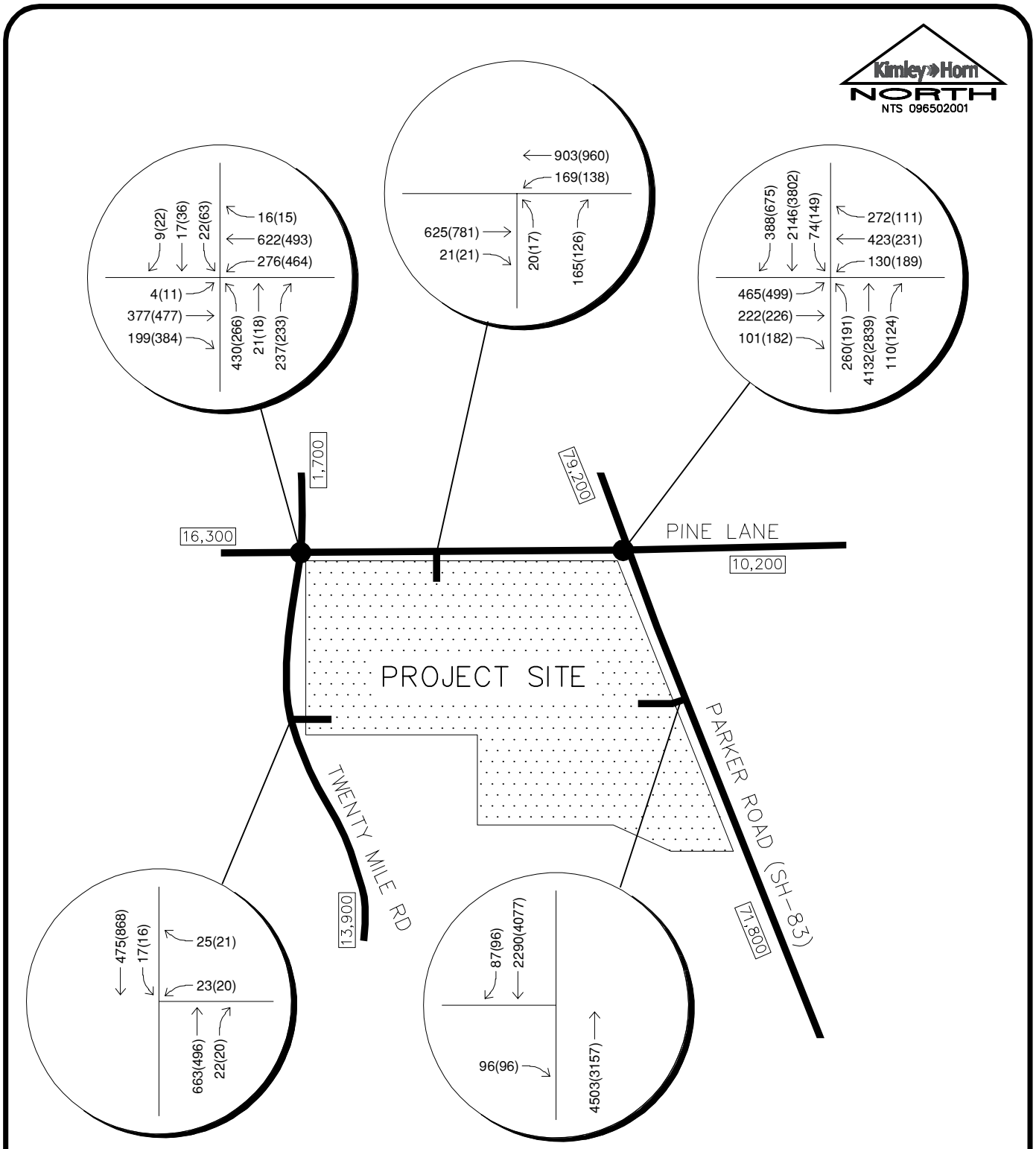
FIGURE 11



PARKER AND PINE
PARKER ROAD & PINE LANE
2022 BACKGROUND
PLUS PROJECT TRAFFIC VOLUMES

FIGURE 12

Kimley»Horn



PARKER AND PINE
PARKER ROAD & PINE LANE
2040 BACKGROUND
PLUS PROJECT TRAFFIC VOLUMES

FIGURE 13

Kimley»Horn

5.0 TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2022 and 2040 development horizons at the identified key intersections and access driveways. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual (HCM)*[2].

5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, standard traffic engineering procedure identifies overall intersection LOS D and movement or approach LOS E as the minimum thresholds for acceptable operations. **Table 2** shows the definition of level of service for signalized and unsignalized intersections.

Table 2 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Definitions provided from the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, LOS for a two-way stop controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. LOS for signalized and four-way stop controlled intersections are defined for each approach and for the overall intersection.

[2] Transportation Research Board, *Highway Capacity Manual*, Special Report 209, Washington DC, 2016.

5.2 Key Intersection Operational Analysis

Calculations for the level of service at the key intersections and project access driveways for the study area are provided in **Appendix E**. The signalized intersection analysis utilizes the observed cycle lengths for the morning and afternoon peak hours with existing phasing and optimized timing splits. The existing year analysis is based on the lane geometry and intersection control shown in **Figure 3.** LOS for the intersections was calculated using Synchro software presenting the HCM results.

Pine Lane and Parker Road (SH-83)

Pine Lane and Parker Road is a four-leg signalized intersection. With this existing configuration, the intersection currently operates at LOS D during the morning peak hour and LOS C during the afternoon peak hour. With or without the addition of project traffic in 2022, the intersection is anticipated to operate at LOS E during the morning peak hour and LOS D during the afternoon peak hour. This identifies that the intersection is very close to needing the conversion to four northbound and southbound through lanes along Parker Road. It is understood that the Town desires this to be constructed soon with the grant application submitted to DRCOG for this improvement earlier this year.

By 2040, the intersection will likely need to be improved to also include dual left turn lanes on the northbound approach. As previously identified, the Parker Road Corridor Plan proposed improvements at the Pine Lane and Parker Road intersection include an eight-lane Parker Road with the absorption of the existing northbound and southbound right turn lanes to be converted to shared through/right turn lanes. The four southbound lanes will extend from the Eastbound E-470 Off Ramp to Lincoln Avenue while four northbound through lanes will extend from the south of Lincoln Avenue to the Westbound E-470 On Ramp. With these improvements by 2040, this intersection is anticipated to operate acceptably during the peak hours. If the northbound and southbound four lanes are implemented in the near-term horizon, acceptable operations would also be expected. The Town of Parker should monitor traffic conditions to determine if and when future improvements are needed. In addition, it is believed that surrounding street network connections will be needed to improve traffic conditions within the study area and reduce the traffic volume through this intersection. **Table 3** provides the results of the level of service at this intersection.

Table 3 – Pine Lane and Parker Road LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2019 Existing	51.5	D	32.0	C
2022 Background	61.6	E	42.6	D
2022 Background Plus Project	67.9	E	50.6	D
2040 Background #	50.6	D	27.5	C
2040 Background Plus Project #	54.4	D	38.8	D

= Includes Dual Northbound Left Turn Lanes and Four Northbound and Southbound Through Lanes

Pine Lane and Twenty Mile Road

Pine Lane and Twenty Mile Road is a four-leg signalized intersection. With this existing configuration, the intersection currently operates at LOS C during the morning peak hour and LOS B during the afternoon peak hour. With or without the addition of project traffic in 2022, the intersection is anticipated to continue to operate acceptably during the morning and afternoon peak hours. However, it is recommended that dual westbound left turn lanes be provided with the completion of this project for vehicle queuing purposes. The second westbound left turn lane is currently striped out and this improvement would only require restriping for dual left turn lanes. With or without the addition of the project traffic in 2040, the intersection is anticipated to operate acceptably with LOS C during both the morning and afternoon peak hour. **Table 4** provides the results of the level of service at this intersection.

Table 4 – Pine Lane and Twenty Mile Road LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2019 Existing	20.1	C	18.3	B
2022 Background	20.4	C	18.7	B
2022 Background Plus Project	21.4	C	19.7	B
2022 Background Plus Project #	27.1	C	27.5	C
2040 Background #	33.5	C	34.1	C
2040 Background Plus Project #	33.9	C	34.5	C

= Includes Dual WB Left Turn Lanes for Vehicle Queuing Purposes

Pine Lane Access

The proposed driveway along Pine Lane will allow full turning movements and is located approximately 550 feet west of Parker Road. It is recommended that the northbound project access approach be stop controlled. It is recommended that a R1-1 "STOP" sign be installed for this northbound approach to Pine Lane. This access is anticipated to have all movements operating at LOS B or better during the morning and afternoon peak hours in 2022 and 2040. **Table 5** provides the results of the level of service at this access intersection.

Table 5 – Pine Lane Access LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2022 Background Plus Project				
Northbound Approach	11.2	B	11.2	B
Westbound Left	8.2	A	8.4	A
2040 Background Plus Project				
Northbound Approach	14.3	B	13.6	B
Westbound Left	8.4	A	8.6	A

Parker Road Access

The proposed driveway along Parker Road will be restricted to right turning movements only and is located approximately 500 feet south of Pine Lane. It is recommended that the project access be stop controlled with installation of a R1-1 "STOP" sign for the eastbound access approach to Parker Road. To further identify the proposed access to right turn movements only, it is recommended that a with a R3-2 No Left Turn sign be placed underneath the "STOP" sign and a R6-1 (R) "ONE WAY" sign be located within the existing raised median directly in front of the driver's view from the access to further identify the exiting movement at the driveway for right turns only. A continuous auxiliary lane exists along this segment of Parker Road for deceleration and acceleration. This access is anticipated to have the eastbound movement operating at LOS B or better during the peak hours in 2022 and 2040. **Table 6** provides the results of the level of service at this access intersection.

Table 6 – Parker Road Access LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2022 Background Plus Project				
Eastbound Right	10.2	B	14.3	B
2040 Background Plus Project #				
Eastbound Right	10.2	B	14.4	B

= Includes Four Northbound and Southbound Through Lanes

Twenty Mile Road Access

The proposed driveway along Twenty Mile Road will allow full turning movements and is located approximately 500 feet south of Pine Lane. It is recommended that the project access approach be stop controlled with installation of a R1-1 "STOP" sign for this westbound approach to Twenty Mile Road. This access is anticipated to have all movements operating at LOS C or better during the AM and PM peak hours in 2022 and 2040. **Table 7** provides the results of the level of service at this access intersection.

Table 7 – Twenty Mile Road Access LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2022 Background Plus Project				
Westbound Approach	14.5	B	14.2	B
Southbound Left	8.8	A	8.3	A
2040 Background Plus Project				
Westbound Approach	17.4	C	17.1	C
Southbound Left	9.3	A	8.6	A

5.3 Queuing Analysis

A left turn lane queuing analysis was conducted for the signalized and unsignalized study area intersections including Pine Lane/Parker Road and Pine Lane/Twenty Mile Road. In addition, the accesses along Pine Lane and Twenty Mile Road were studied. The access along Parker Road was not studied because it operates right in/right out only with a free right turn movement into an auxiliary acceleration lane. The queuing analysis was performed using the Synchro analysis software presenting the results of the 95th percentile queue length. Results are shown in the following **Table 8** with calculations provided within the level of service operational sheets of **Appendix E** for the unsignalized intersections and **Appendix F** for signalized intersections.

Table 8 – Left Turn Lane Queuing Analysis Results

Intersection Turn Lane	Existing Turn Lane Length (feet)	2022 Calculated Queue Length (feet)	2022 Recommended Turn Lane Length (feet)	2040 Calculated Queue Length (feet)	2040 Recommended Turn Lane Length (feet)
Pine Lane & Parker Road					
Eastbound Left	175' DL	294'	**250' DL #**	321'	250' DL #
Westbound Left	325' DL	104'	325' DL	115'	325' DL
Northbound Left	625'	356'	625'	147'	625' **DL**
Southbound Left	550' DL	85'	550' DL	98'	550' DL
Pine Lane & Twenty Mile Road					
Eastbound Left	275'	25'	275'	25'	275'
Westbound Left	200'	92'	200' **DL**	124'	200' DL
Northbound Left	225'	200'	225'	231'	225'
Southbound Left	225'	54'	225'	57'	225'
Pine Lane Access					
Westbound Left	125'	25'	125'	25'	125'
Northbound Approach	DNE	25'	**50'**	50'	50'
Twenty Mile Road Access					
Westbound Approach	DNE	25'	**25'**	25'	25'
Southbound Left	100'	25'	100'	25'	100'

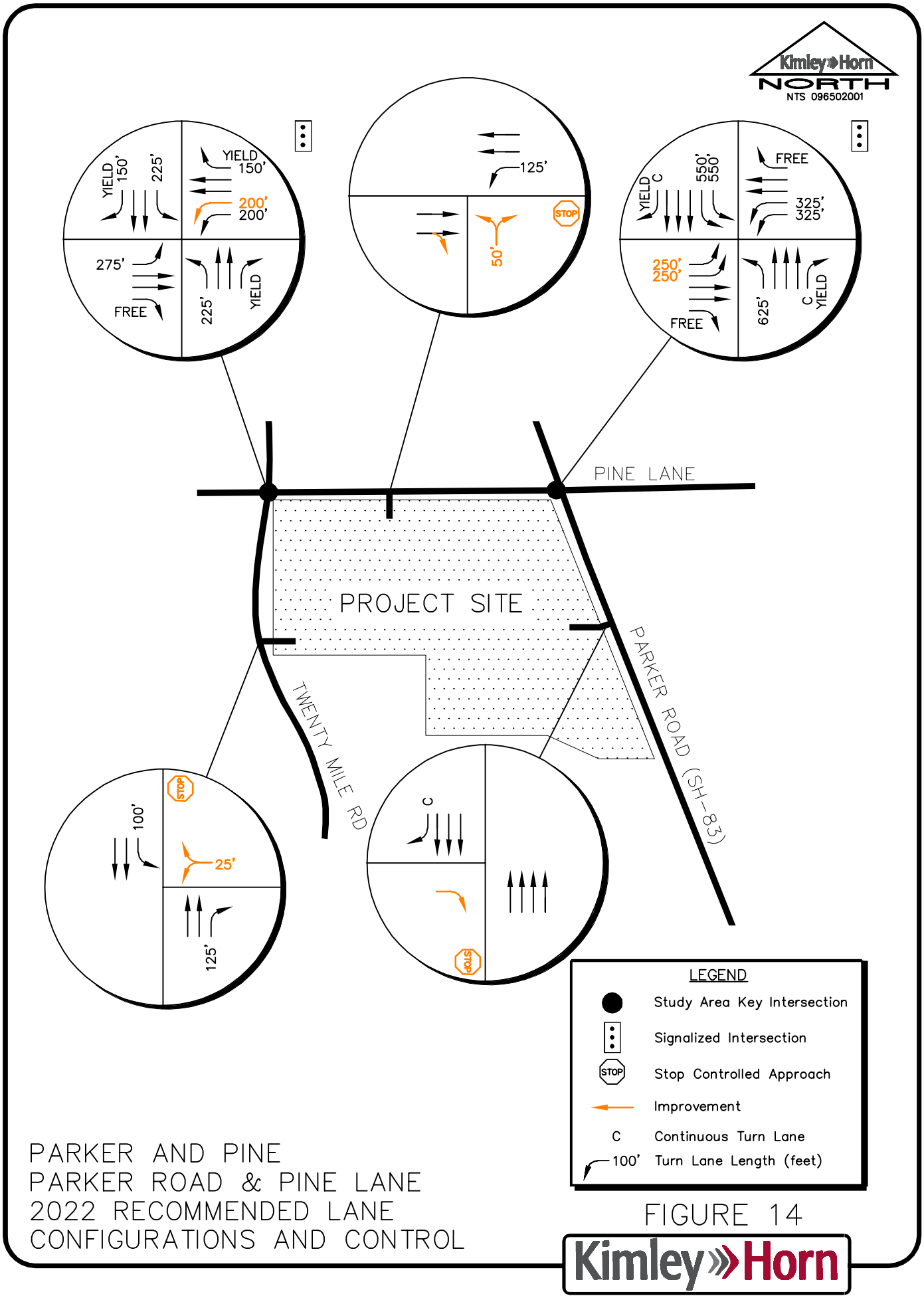
DL = Dual Left Turn Lanes; DNE = Does Not Exist; C = Continuous; # = Maximum Length Possible

Based on the results shown above, it is recommended the eastbound left turn lane at the Pine Lane and Parker Road intersection be extended to the maximum length possible from 175 feet to 250 feet. In addition, it is recommended that the westbound left turn lane at the Pine Lane and Twenty Mile Road intersection be designated to include dual left turn lanes. All other queues either fall within existing storage lengths.

It is recommended that the project access approach to Pine Lane provide a throat depth to accommodate two vehicles of storage (50 feet) to accommodate the long term 2040 horizon traffic volumes. The project access approach to Twenty Mile Road is recommended to provide a throat depth to accommodate one vehicle of storage (25 feet).

By 2040, it is recommended that the northbound left turn lane at Pine Lane and Parker Road be designated to include dual left turn lanes for operational reasons. All other queues either fall within existing storage lengths or cannot be improved due to space restrictions.

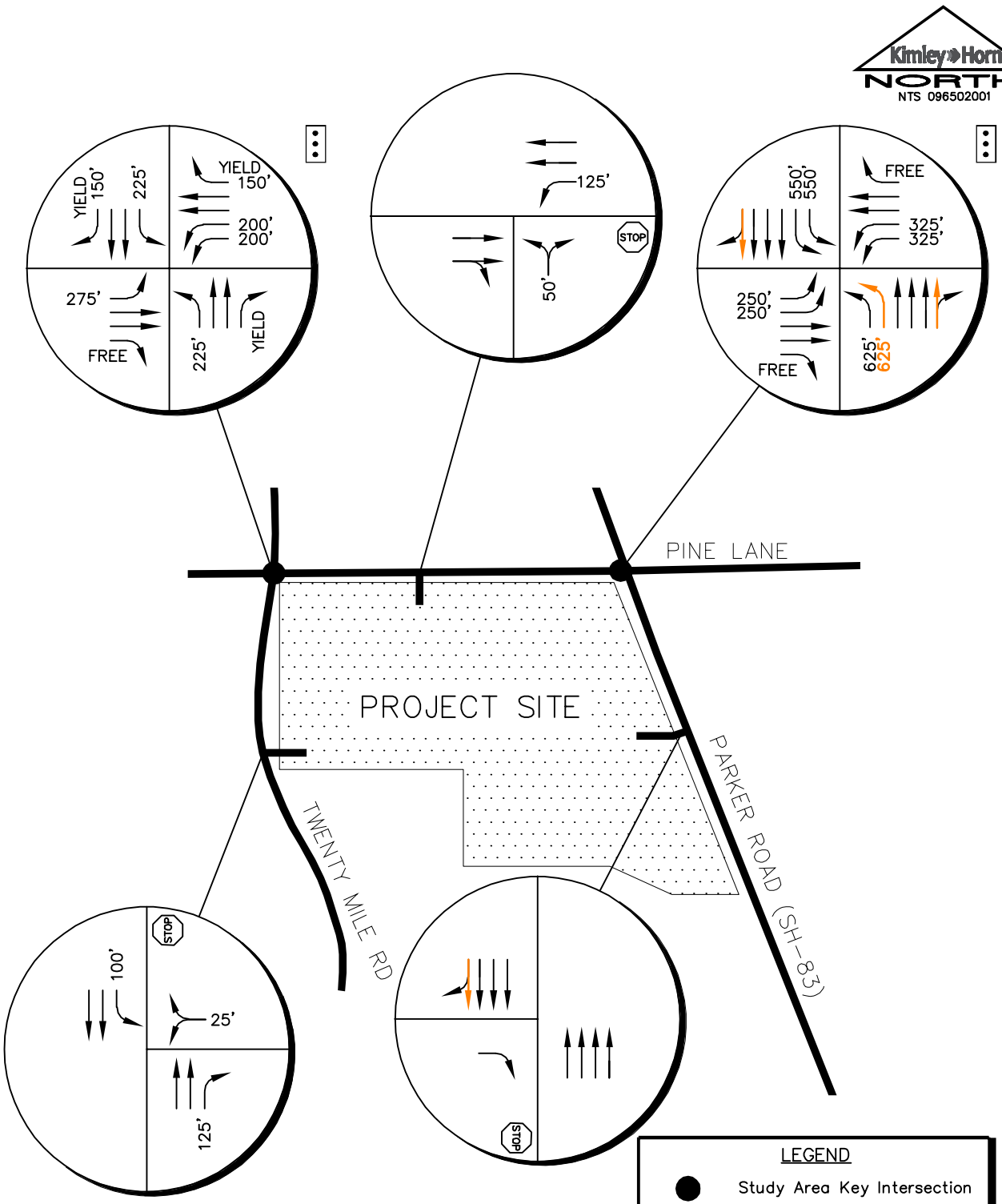
Based on the results of the level of service operational analysis and turn lane analysis, recommended lane configurations and control of the study area intersections are shown in **Figures 14** and **15** for the 2022 short term and 2040 long term horizon, respectively.



PARKER AND PINE
PARKER ROAD & PINE LANE
2022 RECOMMENDED LANE
CONFIGURATIONS AND CONTROL

FIGURE 14

Kimley»Horn



PARKER AND PINE
PARKER ROAD & PINE LANE
2040 RECOMMENDED
LANE CONFIGURATIONS AND CONTROL

FIGURE 15

Kimley»Horn

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, Kimley-Horn believes the proposed Parker and Pine project will be successfully incorporated into the existing roadway network. The proposed project development and expected traffic volumes resulted in the following recommendations:

- The threshold for requiring an access permit along CDOT roadways occurs when project traffic is anticipated to increase the existing access traffic volumes by more than 20 percent. Based on traffic projections, the addition of project traffic on the west leg of Pine Lane at Parker Road (SH-83) is anticipated to increase existing access traffic volumes by more than 20 percent during the peak hour; therefore, it is believed that an access permit for the west leg of Pine Lane at SH-83 will be required by CDOT in association with this project. In addition, an access permit will also be required for the proposed right-in/right-out driveway access along Parker Road.

- It is recommended that the project access along Pine Lane allow full turning movements and that the project access approach be stop controlled with installation of a R1-1 “STOP” sign for the northbound approach to Pine Lane. The project access approach to Pine Lane provide a throat depth to accommodate two vehicles of storage (50 feet).

- It is recommended that the project access along Parker Road (SH-83) be restricted to right-in/right-out movements and that the project access be stop controlled with installation of a R1-1 “STOP” sign for this eastbound access approach to Parker Road. To identify the proposed access to right turn movements only, it is recommended that a with a R3-2 No Left Turn sign be placed underneath the “STOP” sign and a R6-1 (R) “ONE WAY” sign be located within the existing raised median directly in front of the driver’s view from the access to further identify the exiting movement at the driveway for right turns only.

- It is recommended that the project access along Twenty Mile Road allow full turning movements and that the project access approach be stop controlled. A R1-1 “STOP” sign should be installed for the westbound approach to Twenty Mile Road. The project access approach is recommended to provide a throat depth to accommodate one vehicle of storage (25 feet).

- With development of the project, it is recommended the westbound left turn lane at the Pine Lane and Twenty Mile Road intersection be restriped to include 200-foot dual left turn lanes.

- With development of the project, it is recommended the eastbound left turn lane length at the Pine Lane and Parker Road (SH-83) intersection be extended to its maximum possible length from the existing 175 feet to 250 feet. This will require restriping of Pine Lane by modifying the turn bay taper.

- By 2040, the Pine Lane and Parker Road (SH-83) intersection was found to have operational issues if the background traffic volumes are realized. Therefore, to provide the most optimal traffic lanes available, the northbound left turn at the Pine Lane and Parker Road (SH-83) intersection may need to be expanded to include dual left turn lanes. An area is striped out for these dual left turn lanes already (to shadow the southbound dual lefts) so implementation of northbound dual lefts is feasible. Further, and as identified in the Parker Road Corridor Plan, Parker Road may need to provide four through lanes in each direction within the project limits. The existing northbound and southbound right turn lanes at the Pine Lane and Parker Road intersection would be converted to shared through/right turn lanes. The four southbound lanes will extend from the Eastbound E-470 Off Ramp to Lincoln Avenue while four northbound through lanes will extend from the south of Lincoln Avenue to the Westbound E-470 On Ramp.

- All off-site and on-site improvements should be incorporated into the Civil Drawings, and conform to standards of the Town of Parker, CDOT, American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, Institute of Transportation Engineers (ITE), and the Manual on Traffic Control Devices (MUTCD) – 2009 Edition.

APPENDICES

APPENDIX A

Town of Parker Traffic Impact Study Checklist

Parker COLORADO

TIS Standard Checklist

Development: Parker and Pine
Filing:
Consultant: Kimley-Horn and Associates, Inc.

Date: 10/7/2019
Submittal Number:
Reviewed By:

Required Discussions - To be completed by the Transportation Consultant Engineer:

REPORT SECTION	COMPLETED	N/A	COMMENTS
GENERAL	☐	☐	
Original & Revision Dates	☑	☐	
Dated, Checked, Sealed & Signed by P.E.	☑	☐	
INTRODUCTION	☐	☐	
Vicinity Map	☑	☐	
Proposed Project Site Plan	☑	☐	
Proposed Development Phasing	☐	☑	
Existing & Proposed Land Uses Surrounding Site	☑	☐	
EXISTING CONDITIONS	☐	☐	
Roadway Counts < One Year Old	☑	☐	Estimated from intersection counts
Intersection Counts < Six Months Old	☑	☐	
Existing LOS Summary (Table)	☑	☐	
PROPOSED CONDITIONS	☐	☐	
Trip Generation Summary (Table)	☑	☐	
Internal Trip Reduction Justification (< 10%)	☑	☐	Based on ITE Procedures and Methodology
Pass-by Trip Reduction Justification (< 15%)	☑	☐	Based on ITE Procedures and Methodology
Trip Distribution Assumptions	☑	☐	
Site Trip Distribution (Figure)	☑	☐	
Projected Site Traffic Volumes (Figure) - Each Phase	☑	☐	

REPORT SECTION	COMPLETED	N/A	COMMENTS
FUTURE CONDITIONS	☐	☐	
Background Transportation Improvements	☑	☐	
Background Growth Method & Assumptions	☑	☐	
Background Traffic Volumes (Figure) - Each Phase	☑	☐	
Total Traffic Volumes (Figure) - Each Phase	☑	☐	
SITE CIRCULATION & DESIGN EVALUATION	☐	☐	
Level of Service Analysis - Each Phase (Figures/Table)	☑	☐	
Queuing Analysis - Vehicle Storage Lengths	☑	☐	
Traffic Signal Warrant Analysis	☐	☑	
Traffic Signal Progression	☐	☑	
Safety Analysis	☐	☑	
PROPOSED MITIGATION MEASURES	☐	☐	
Level of Service for Each Intersection Movement (Table)	☑	☐	
CONCLUSIONS/RECOMMENDATIONS	☐	☐	
Improvements/Lane Configurations (Figure)	☑	☐	
Recommended Construction Phasing	☐	☑	
APPENDIX	☐	☐	
Traffic Count Data	☑	☐	
Traffic Analysis Software Output Reports (All Periods)	☑	☐	
Time-space Diagrams	☐	☑	

"I have reviewed the attached report with this checklist and all required items have been included except as noted above."

Signature of Professional Engineer

APPENDIX B

Intersection Count Sheets

Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
AM Peak
Pine Lane and Parker Road

File Name : Pine and Parker AM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 1

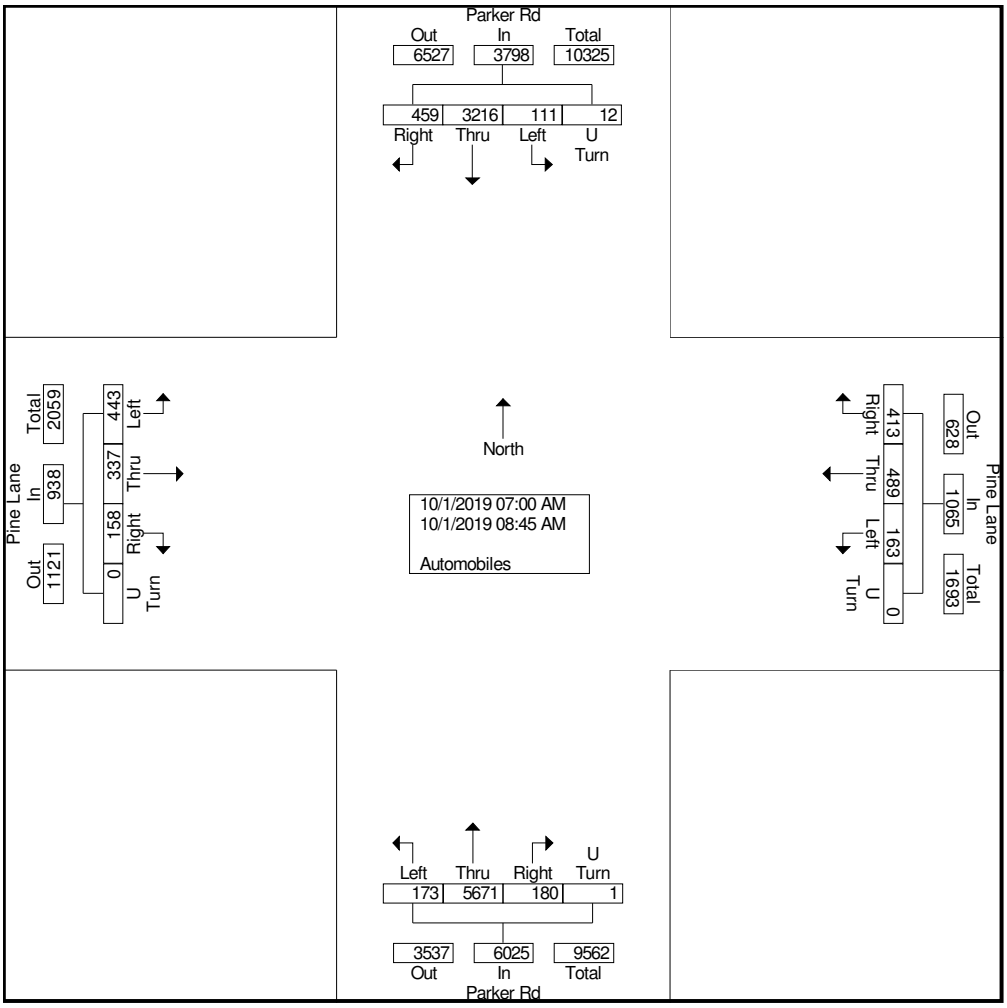
Groups Printed- Automobiles

	Pine Lane Eastbound					Pine Lane Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
07:00 AM	47	91	8	0	146	17	81	44	0	142	14	726	34	0	774	21	317	51	0	389	1451
07:15 AM	66	57	25	0	148	43	100	46	0	189	25	824	36	0	885	12	371	36	2	421	1643
07:30 AM	42	28	19	0	89	24	84	62	0	170	23	848	10	0	881	7	406	73	3	489	1629
07:45 AM	62	40	18	0	120	12	74	44	0	130	33	784	18	0	835	16	416	84	1	517	1602
Total	217	216	70	0	503	96	339	196	0	631	95	3182	98	0	3375	56	1510	244	6	1816	6325
08:00 AM	74	34	15	0	123	15	58	57	0	130	28	723	20	1	772	14	397	77	2	490	1515
08:15 AM	49	24	33	0	106	12	36	57	0	105	16	665	15	0	696	19	429	47	0	495	1402
08:30 AM	48	29	12	0	89	13	29	51	0	93	17	592	21	0	630	11	379	44	3	437	1249
08:45 AM	55	34	28	0	117	27	27	52	0	106	17	509	26	0	552	11	501	47	1	560	1335
Total	226	121	88	0	435	67	150	217	0	434	78	2489	82	1	2650	55	1706	215	6	1982	5501
Grand Total	443	337	158	0	938	163	489	413	0	1065	173	5671	180	1	6025	111	3216	459	12	3798	11826
Apprch %	47.2	35.9	16.8	0		15.3	45.9	38.8	0		2.9	94.1	3	0		2.9	84.7	12.1	0.3		
Total %	3.7	2.8	1.3	0	7.9	1.4	4.1	3.5	0	9	1.5	48	1.5	0	50.9	0.9	27.2	3.9	0.1	32.1	

Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
AM Peak
Pine Lane and Parker Road

File Name : Pine and Parker AM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 2

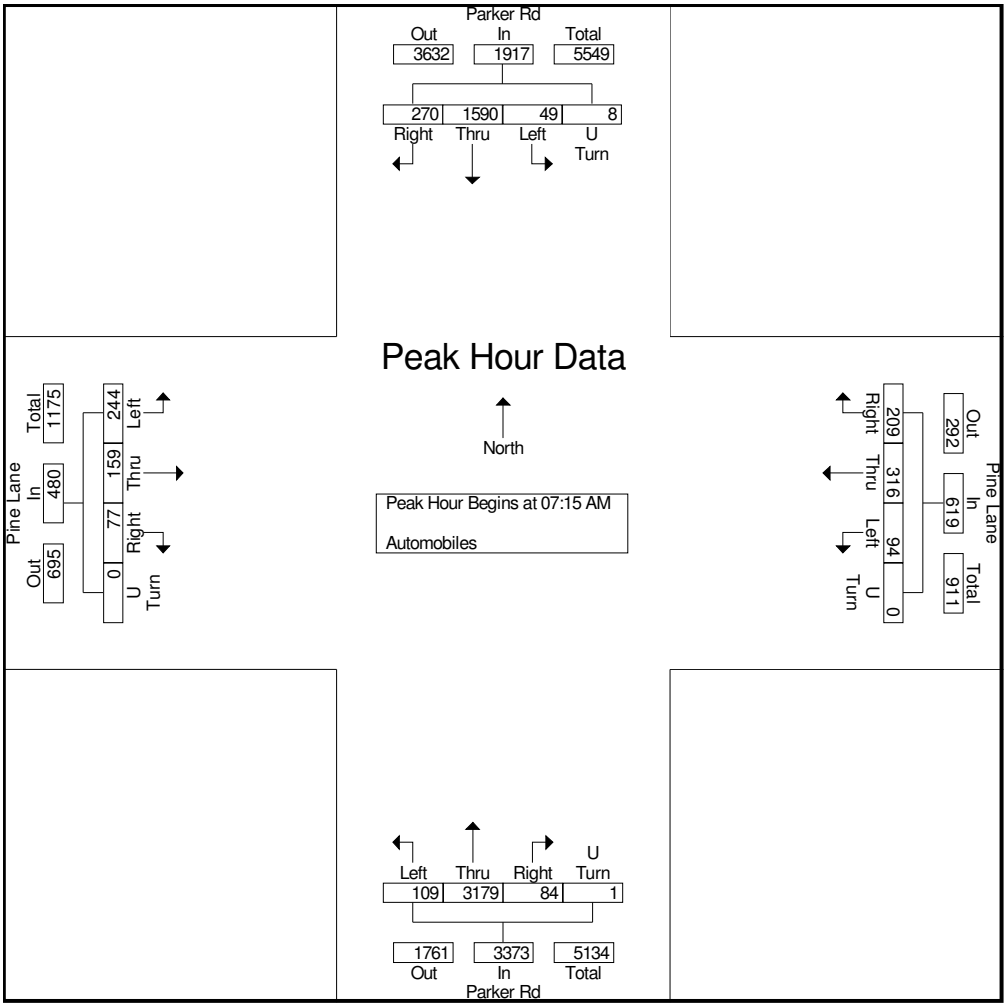


Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
AM Peak
Pine Lane and Parker Road

File Name : Pine and Parker AM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 3

	Pine Lane Eastbound					Pine Lane Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	66	**57**	**25**	0	**148**	**43**	**100**	46	0	**189**	25	824	**36**	0	**885**	12	371	36	2	421	**1643**
07:30 AM	42	28	19	0	89	24	84	**62**	0	170	23	**848**	10	0	881	7	406	73	**3**	489	1629
07:45 AM	62	40	18	0	120	12	74	44	0	130	**33**	784	18	0	835	**16**	**416**	**84**	1	**517**	1602
08:00 AM	**74**	34	15	0	123	15	58	57	0	130	28	723	20	**1**	772	14	397	77	2	490	1515
Total Volume	244	159	77	0	480	94	316	209	0	619	109	3179	84	1	3373	49	1590	270	8	1917	6389
% App. Total	50.8	33.1	16	0		15.2	51.1	33.8	0		3.2	94.2	2.5	0		2.6	82.9	14.1	0.4		
PHF	.824	.697	.770	.000	.811	.547	.790	.843	.000	.819	.826	.937	.583	.250	.953	.766	.956	.804	.667	.927	.972



Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
PM Peak
Pine Lane and Parker Road

File Name : Pine and Parker PM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 1

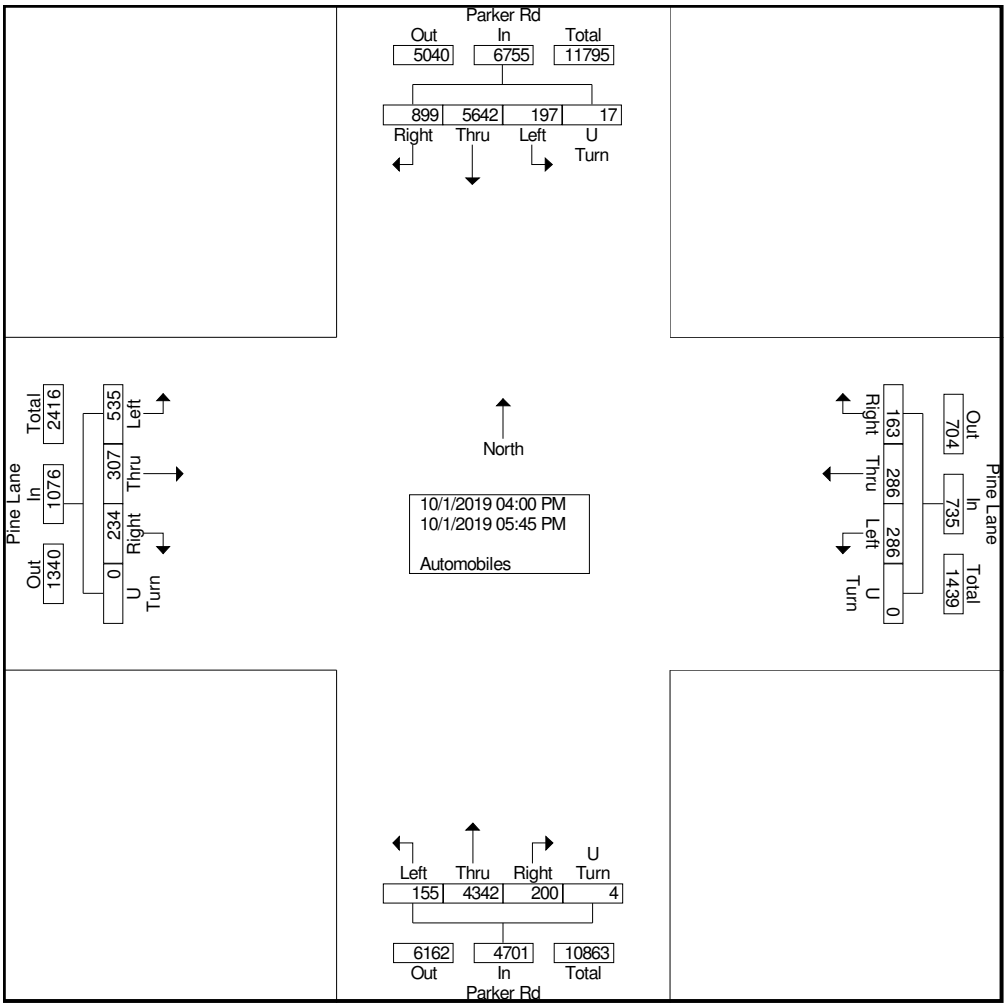
Groups Printed- Automobiles

	Pine Lane Eastbound					Pine Lane Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
04:00 PM	71	34	22	0	127	25	30	16	0	71	19	561	41	0	621	19	692	81	0	792	1611
04:15 PM	59	38	20	0	117	39	22	14	0	75	12	547	23	1	583	26	724	114	2	866	1641
04:30 PM	60	47	33	0	140	34	48	25	0	107	20	540	33	0	593	20	672	127	1	820	1660
04:45 PM	78	38	28	0	144	38	52	22	0	112	22	525	21	1	569	25	723	113	4	865	1690
Total	268	157	103	0	528	136	152	77	0	365	73	2173	118	2	2366	90	2811	435	7	3343	6602
05:00 PM	76	39	46	0	161	32	36	17	0	85	15	576	23	1	615	29	734	130	6	899	1760
05:15 PM	85	38	31	0	154	35	36	21	0	92	19	539	19	0	577	28	723	119	2	872	1695
05:30 PM	54	41	32	0	127	46	24	20	0	90	22	534	21	0	577	32	720	109	2	863	1657
05:45 PM	52	32	22	0	106	37	38	28	0	103	26	520	19	1	566	18	654	106	0	778	1553
Total	267	150	131	0	548	150	134	86	0	370	82	2169	82	2	2335	107	2831	464	10	3412	6665
Grand Total	535	307	234	0	1076	286	286	163	0	735	155	4342	200	4	4701	197	5642	899	17	6755	13267
Apprch %	49.7	28.5	21.7	0		38.9	38.9	22.2	0		3.3	92.4	4.3	0.1		2.9	83.5	13.3	0.3		
Total %	4	2.3	1.8	0	8.1	2.2	2.2	1.2	0	5.5	1.2	32.7	1.5	0	35.4	1.5	42.5	6.8	0.1	50.9	

Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
PM Peak
Pine Lane and Parker Road

File Name : Pine and Parker PM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 2

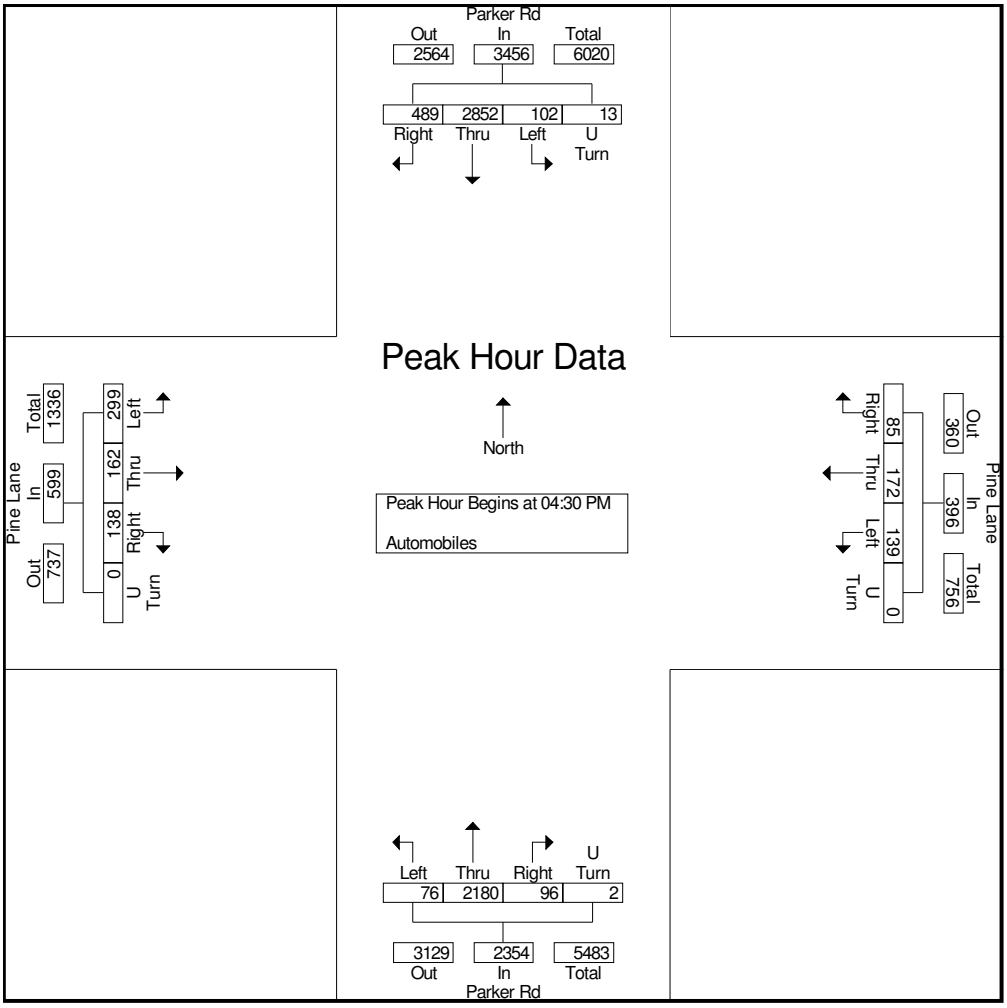


Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
PM Peak
Pine Lane and Parker Road

File Name : Pine and Parker PM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 3

	Pine Lane Eastbound					Pine Lane Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	60	**47**	33	0	140	34	48	**25**	0	107	20	540	**33**	0	593	20	672	127	1	820	1660
04:45 PM	78	38	28	0	144	**38**	**52**	22	0	**112**	**22**	525	21	**1**	569	25	723	113	4	865	1690
05:00 PM	76	39	**46**	0	**161**	32	36	17	0	85	15	**576**	23	1	**615**	**29**	**734**	**130**	**6**	**899**	**1760**
05:15 PM	**85**	38	31	0	154	35	36	21	0	92	19	539	19	0	577	28	723	119	2	872	1695
Total Volume	299	162	138	0	599	139	172	85	0	396	76	2180	96	2	2354	102	2852	489	13	3456	6805
% App. Total	49.9	27	23	0		35.1	43.4	21.5	0		3.2	92.6	4.1	0.1		3	82.5	14.1	0.4		
PHF	.879	.862	.750	.000	.930	.914	.827	.850	.000	.884	.864	.946	.727	.500	.957	.879	.971	.940	.542	.961	.967



Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
AM Peak
Pine Lane and Twenty Mile Road

File Name : Pine and Twenty Mile AM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 1

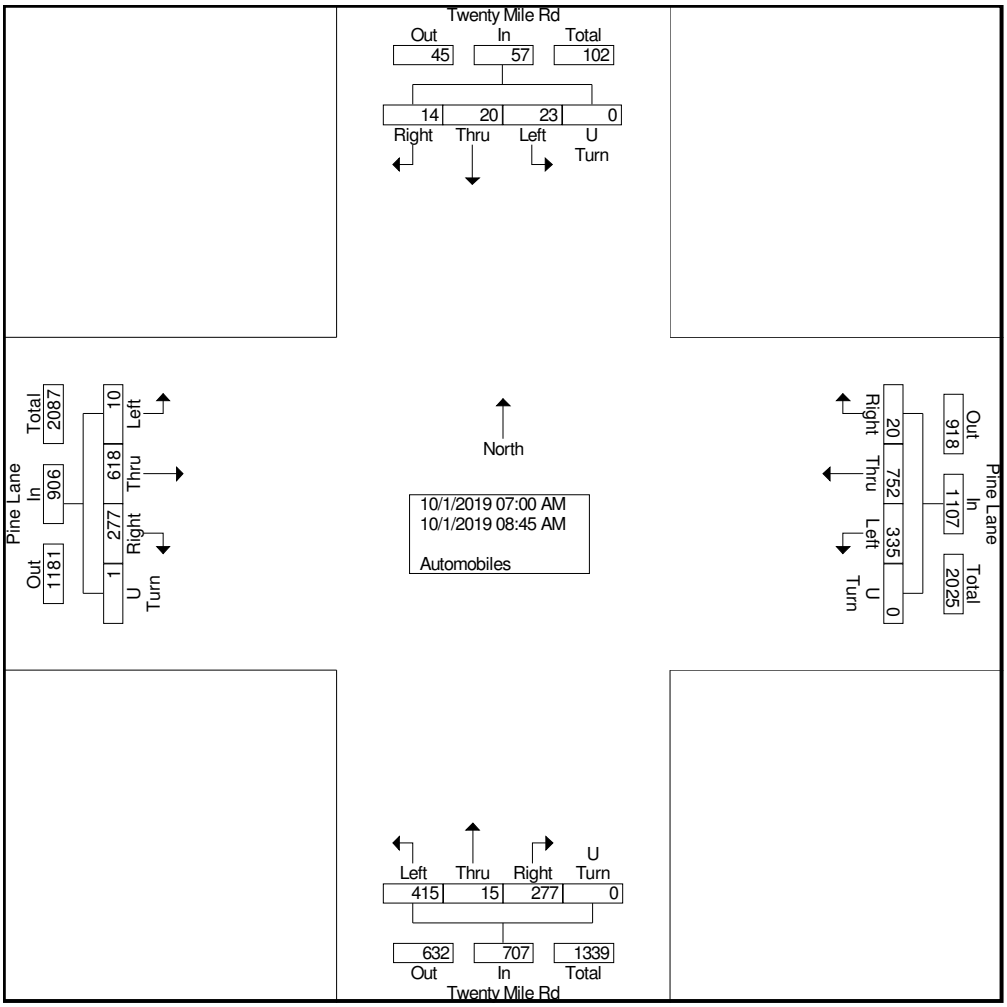
Groups Printed- Automobiles

	Pine Lane Eastbound					Pine Lane Westbound					Twenty Mile Rd Northbound					Twenty Mile Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
07:00 AM	1	105	18	0	124	40	98	4	0	142	32	0	37	0	69	0	4	2	0	6	341
07:15 AM	2	91	28	0	121	32	124	1	0	157	53	2	47	0	102	6	3	0	0	9	389
07:30 AM	1	56	43	1	101	50	119	4	0	173	87	2	26	0	115	3	1	1	0	5	394
07:45 AM	0	74	44	0	118	77	110	1	0	188	90	3	47	0	140	1	4	2	0	7	453
Total	4	326	133	1	464	199	451	10	0	660	262	7	157	0	426	10	12	5	0	27	1577
08:00 AM	0	57	28	0	85	51	116	2	0	169	83	4	60	0	147	4	0	4	0	8	409
08:15 AM	1	81	30	0	112	25	72	2	0	99	27	2	22	0	51	3	3	1	0	7	269
08:30 AM	4	69	39	0	112	24	61	4	0	89	24	0	20	0	44	2	4	2	0	8	253
08:45 AM	1	85	47	0	133	36	52	2	0	90	19	2	18	0	39	4	1	2	0	7	269
Total	6	292	144	0	442	136	301	10	0	447	153	8	120	0	281	13	8	9	0	30	1200
Grand Total	10	618	277	1	906	335	752	20	0	1107	415	15	277	0	707	23	20	14	0	57	2777
Apprch %	1.1	68.2	30.6	0.1		30.3	67.9	1.8	0		58.7	2.1	39.2	0		40.4	35.1	24.6	0		
Total %	0.4	22.3	10	0	32.6	12.1	27.1	0.7	0	39.9	14.9	0.5	10	0	25.5	0.8	0.7	0.5	0	2.1	

Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
AM Peak
Pine Lane and Twenty Mile Road

File Name : Pine and Twenty Mile AM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 2

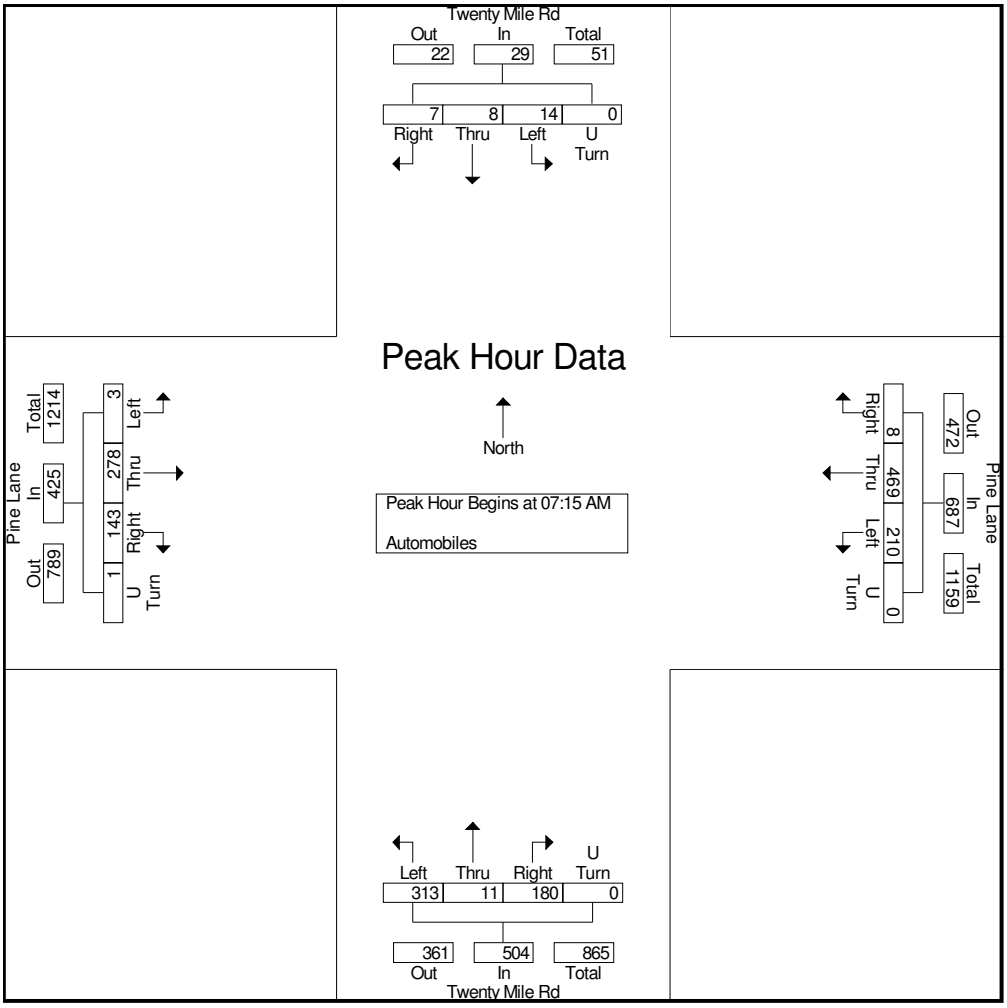


Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
AM Peak
Pine Lane and Twenty Mile Road

File Name : Pine and Twenty Mile AM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 3

	Pine Lane Eastbound					Pine Lane Westbound					Twenty Mile Rd Northbound					Twenty Mile Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	**2**	**91**	28	0	**121**	32	**124**	1	0	157	53	2	47	0	102	**6**	3	0	0	**9**	389
07:30 AM	1	56	43	**1**	101	50	119	**4**	0	173	87	2	26	0	115	3	1	1	0	5	394
07:45 AM	0	74	**44**	0	118	**77**	110	1	0	**188**	**90**	3	47	0	140	1	**4**	2	0	7	**453**
08:00 AM	0	57	28	0	85	51	116	2	0	169	83	**4**	**60**	0	**147**	4	0	**4**	0	8	409
Total Volume	3	278	143	1	425	210	469	8	0	687	313	11	180	0	504	14	8	7	0	29	1645
% App. Total	0.7	65.4	33.6	0.2		30.6	68.3	1.2	0		62.1	2.2	35.7	0		48.3	27.6	24.1	0		
PHF	.375	.764	.813	.250	.878	.682	.946	.500	.000	.914	.869	.688	.750	.000	.857	.583	.500	.438	.000	.806	.908



Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
PM Peak
Pine Lane and Twenty Mile Road

File Name : Pine and Twenty Mile PM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 1

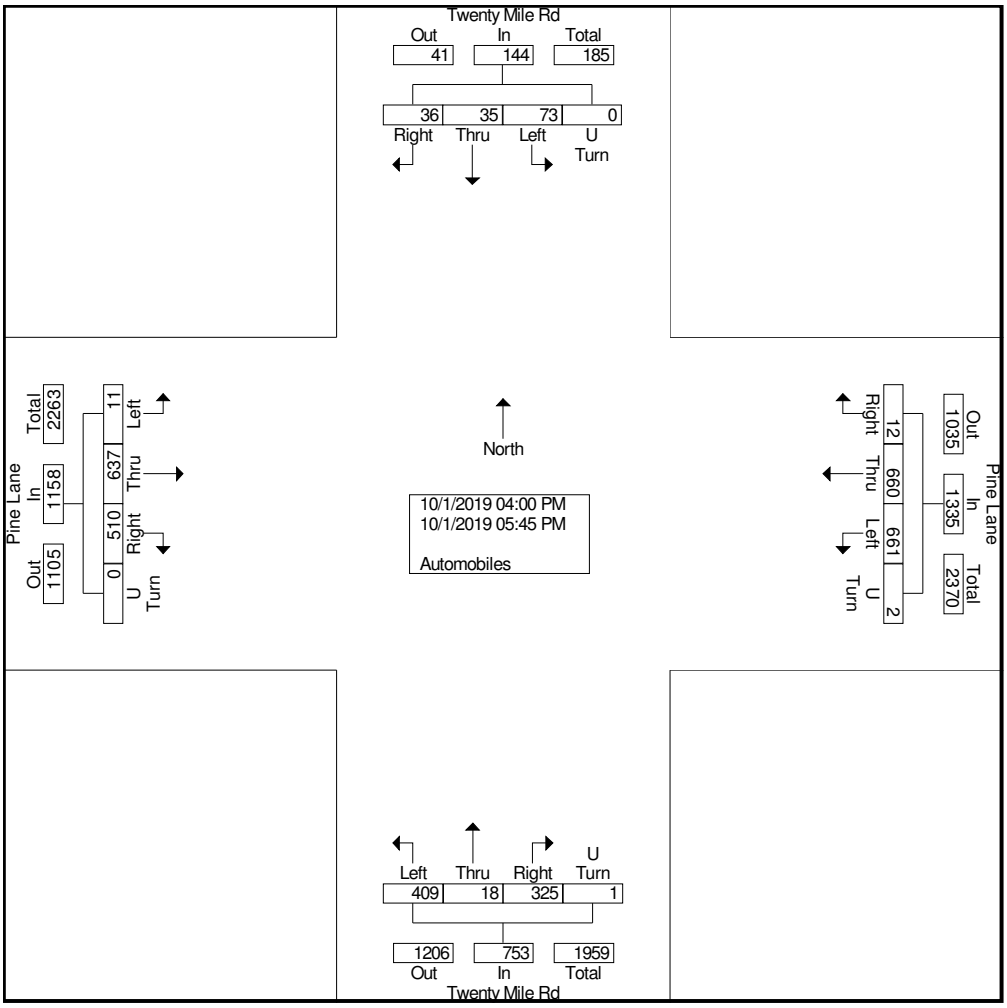
Groups Printed- Automobiles

	Pine Lane Eastbound					Pine Lane Westbound					Twenty Mile Rd Northbound					Twenty Mile Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
04:00 PM	1	74	50	0	125	65	70	1	0	136	69	4	53	0	126	9	5	5	0	19	406
04:15 PM	2	64	56	0	122	81	63	2	0	146	51	2	44	0	97	8	3	4	0	15	380
04:30 PM	1	71	53	0	125	91	101	2	0	194	48	1	47	0	96	12	7	4	0	23	438
04:45 PM	2	75	73	0	150	89	92	2	1	184	53	3	51	1	108	7	3	2	0	12	454
Total	6	284	232	0	522	326	326	7	1	660	221	10	195	1	427	36	18	15	0	69	1678
05:00 PM	2	110	76	0	188	82	92	1	0	175	43	1	41	0	85	15	7	5	0	27	475
05:15 PM	3	99	82	0	184	91	87	3	0	181	46	4	38	0	88	11	6	6	0	23	476
05:30 PM	0	78	70	0	148	71	80	1	1	153	49	1	27	0	77	5	3	5	0	13	391
05:45 PM	0	66	50	0	116	91	75	0	0	166	50	2	24	0	76	6	1	5	0	12	370
Total	5	353	278	0	636	335	334	5	1	675	188	8	130	0	326	37	17	21	0	75	1712
Grand Total	11	637	510	0	1158	661	660	12	2	1335	409	18	325	1	753	73	35	36	0	144	3390
Apprch %	0.9	55	44	0		49.5	49.4	0.9	0.1		54.3	2.4	43.2	0.1		50.7	24.3	25	0		
Total %	0.3	18.8	15	0	34.2	19.5	19.5	0.4	0.1	39.4	12.1	0.5	9.6	0	22.2	2.2	1	1.1	0	4.2	

Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
PM Peak
Pine Lane and Twenty Mile Road

File Name : Pine and Twenty Mile PM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 2

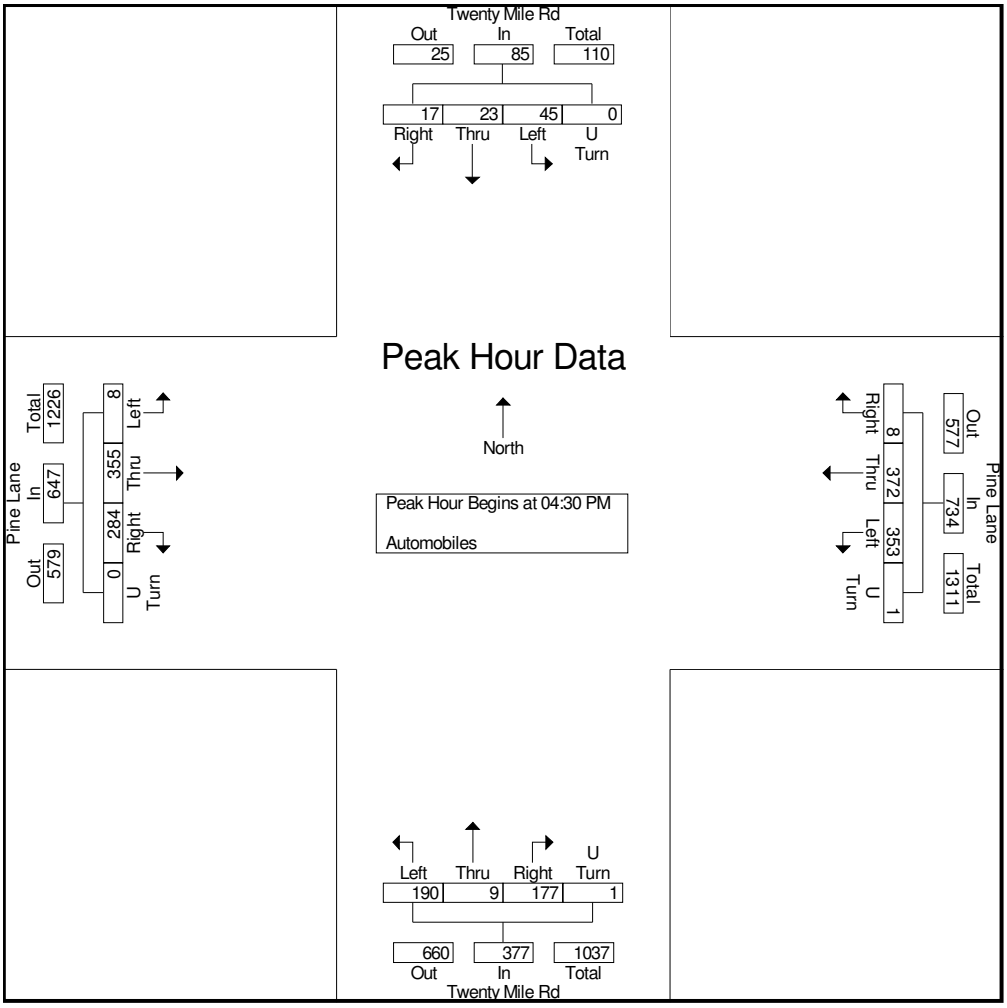


Ridgeview Data Collection

Parker, CO
Parker and Pine Retail
PM Peak
Pine Lane and Twenty Mile Road

File Name : Pine and Twenty Mile PM
Site Code : IPO 460
Start Date : 10/1/2019
Page No : 3

	Pine Lane Eastbound					Pine Lane Westbound					Twenty Mile Rd Northbound					Twenty Mile Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	1	71	53	0	125	**91**	**101**	2	0	**194**	48	1	47	0	96	12	**7**	4	0	23	438
04:45 PM	2	75	73	0	150	89	92	2	**1**	184	**53**	3	**51**	**1**	**108**	7	3	2	0	12	454
05:00 PM	2	**110**	76	0	**188**	82	92	1	0	175	43	1	41	0	85	**15**	7	5	0	**27**	475
05:15 PM	**3**	99	**82**	0	184	91	87	**3**	0	181	46	**4**	38	0	88	11	6	**6**	0	23	**476**
Total Volume	8	355	284	0	647	353	372	8	1	734	190	9	177	1	377	45	23	17	0	85	1843
% App. Total	1.2	54.9	43.9	0		48.1	50.7	1.1	0.1		50.4	2.4	46.9	0.3		52.9	27.1	20	0		
PHF	.667	.807	.866	.000	.860	.970	.921	.667	.250	.946	.896	.563	.868	.250	.873	.750	.821	.708	.000	.787	.968



APPENDIX C

CDOT Traffic Data & Douglas County Transportation Plan Maps

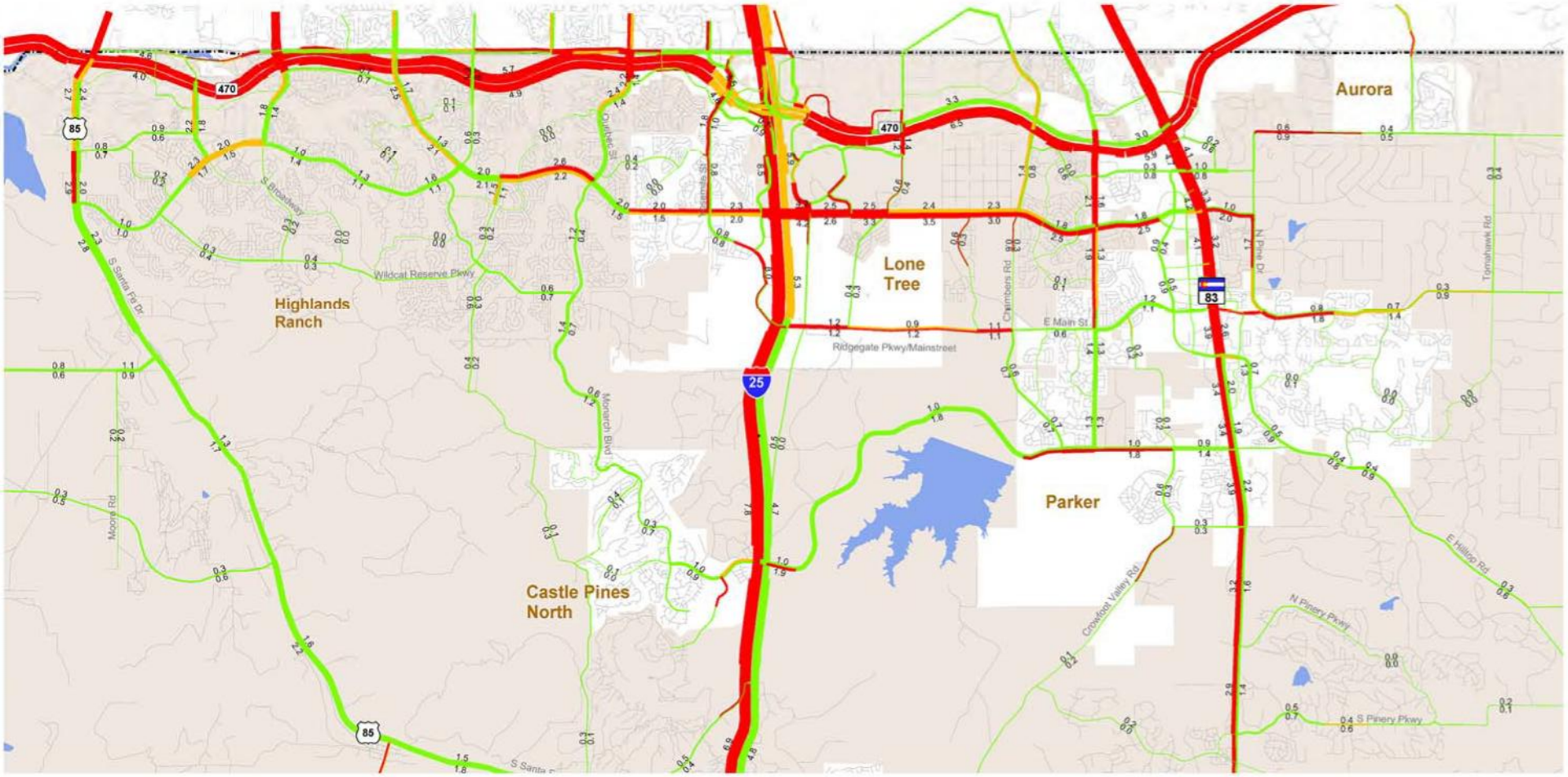
CDOT Traffic Projections

ROUTE	REFPT	ENDREFPT	AADT	AADTYR	YR20FACTOR	DHV	LOCATION
083A	60.914	61.448	56000	2018	1.27	9.5	ON SH-83 N/O LINCOLN AVE
083A	61.448	62.075	59000	2018	1.25	9.5	ON SH-83 S/O E-470

Annual Growth: 1.20%

1.12%

FIGURE 23: 2020 PM PEAK HOUR TRAFFIC FORECASTS AND CONGESTION LEVELS – NORTH CENTRAL DOUGLAS COUNTY



Legend

Directional PM Peak Hour Level of Service
- Uncongested (A - C)
- Congesting (D)
- Congested (E - F)

Directional PM Peak Hour Traffic Volumes

7,500 3,750 1,875

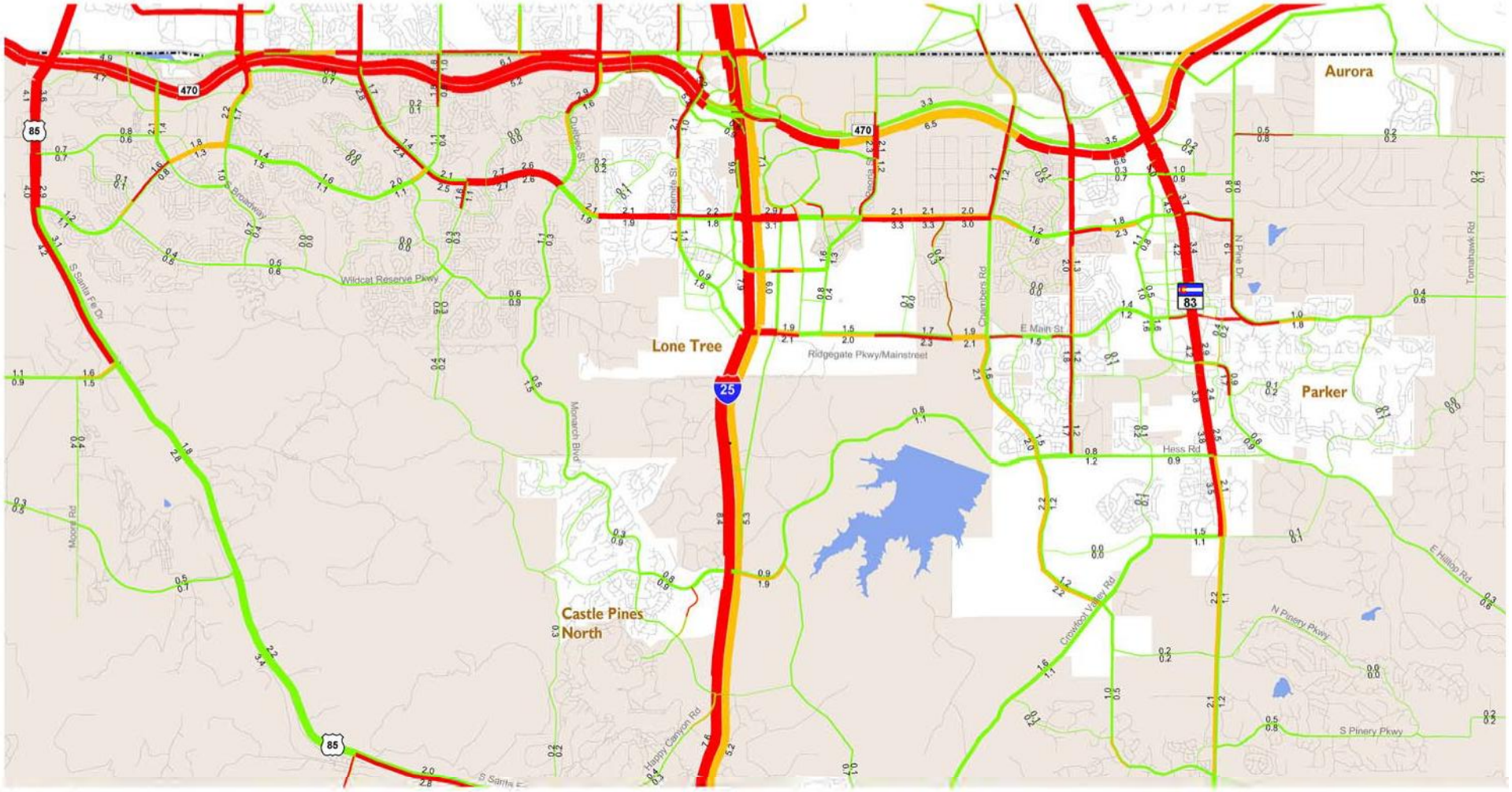
X.X: Directional PM Peak Hour Traffic Volume in thousands

- County Boundary
- Lakes
- Incorporated Areas

0 1.25 2.5
Miles

N

FIGURE 27: 2030 PM PEAK HOUR TRAFFIC FORECASTS AND CONGESTION LEVELS – NORTH CENTRAL DOUGLAS COUNTY



APPENDIX D

Trip Generation Worksheets

Kimley»Horn

Project	Parker and Pine				
Subject	Trip Generation for Multifamily Housing (Mid-Rise)				
Designed by	JRP	*Date*	October 07, 2019	*Job No.*	096502001
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Multifamily Housing (Mid-Rise) (221)

Independant Variable - Dwelling Units (X)

X = 175
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 200 Page 74)

Directional Distribution: 26% ent. 74% exit.

Ln(T) = 0.98 Ln(X) - 0.98
Ln(T) = 0.98 * Ln(175.0) - 0.98

T = 59 Average Vehicle Trip Ends
15 entering 44 exiting

15 + 44 = 59

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 200 Page 75)

Directional Distribution: 61% ent. 39% exit.

Ln(T) = 0.96 Ln(X) - 0.63
Ln(T) = 0.96 * Ln(175.0) - 0.63

T = 76 Average Vehicle Trip Ends
46 entering 30 exiting

46 + 30 = 76

Weekday (Series 200 Page 73)

Directional Distribution: 50% ent. 50% exit.

(T) = 5.45*(X) - 1.75
(T) = 5.45 * 175 - 1.75

T = 952 Average Vehicle Trip Ends
476 entering 476 exiting

476 + 476 = 952

Peak Hour of Generator, Saturday (Series 200 Page 79)

Directional Distribution: 49% ent. 51% exit.

(T) = 0.42*(X) + 6.73
(T) = 0.42 * 175 + 6.73

T = 80 Average Vehicle Trip Ends
39 entering 41 exiting

39 + 41 = 80

Kimley»Horn

Project	Parker and Pine				
Subject	Trip Generation for Day Care Center				
Designed by	JRP	*Date*	October 07, 2019	*Job No.*	096502001
Checked by		*Date*		*Sheet No.*	1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Day Care Center (565)

Independant Variable - 1000 Square Feet Gross Floor Area (X)
Gross Floor Area = 13,000 Square Feet
X = 13.000
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (500 Series page 226)

Average Weekday
T = 11.00 (X)
T = 11.00 * 13.000

Directional Distribution: 53% ent. 47% exit.
T = 143 Average Vehicle Trip Ends
76 entering 67 exiting

76 + 67 = 143

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (500 Series page 227)

Average Weekday
T = 11.12 (X)
T = 11.12 * 13.000

Directional Distribution: 47% ent. 53% exit.
T = 145 Average Vehicle Trip Ends
68 entering 77 exiting

68 + 77 = 145

Weekday (500 Series page 225)

Average Weekday
T = 47.62 (X)
T = 47.62 * 13.000

Directional Distribution: 50% entering, 50% exiting
T = 620 Average Vehicle Trip Ends
310 entering 310 exiting

310 + 310 = 620

Kimley»Horn

Project	Parker and Pine				
Subject	Trip Generation for Shopping Center				
Designed by	JRP	*Date*	October 07, 2019	*Job No.*	096502001
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = 17,000 Square Feet
X = 17.000
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 139)

Average Weekday — Directional Distribution: 62% ent. 38% exit.
T = 0.94 * (X) — T = 16 Average Vehicle Trip Ends
T = 0.94 * 17 — 10 entering 6 exiting

10 + 6 = 16

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series page 140)

Average Weekday — Directional Distribution: 48% ent. 52% exit.
T = 3.81 * (X) — T = 65 Average Vehicle Trip Ends
T = 3.81 * 17 — 31 entering 34 exiting

31 + 34 = 65

Weekday (800 Series page 138)

Average Weekday — Directional Distribution: 50% entering, 50% exiting
T = 37.75 * (X) — T = 642 Average Vehicle Trip Ends
T = 37.75 * 17 — 321 entering 321 exiting

321 + 321 = 642

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 190)

AM Peak Hour = 66% Non-Pass By — PM Peak Hour = 66% Non-Pass By

	IN	Out	Total
AM Peak	7	4	11
PM Peak	20	22	43
Daily	212	212	424

PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 190)

AM Peak Hour = 34% Pass By — PM Peak Hour = 34% Pass By

	IN	Out	Total
AM Peak	3	2	6
PM Peak	11	12	22
Daily	109	109	218

PM Peak Hour Rate Applied to Daily

Kimley»Horn

Project	Parker and Pine				
Subject	Trip Generation for Fast-Food Restaurant with Drive-Through Window				
Designed by	JRP	*Date*	October 07, 2019	*Job No.*	096502001
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)
Gross Floor Area = 6,000 Square Feet
X = 6.000
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday — Directional Distribution: 51% ent. 49% exit.
T = 40.19 (X) — T = 241 Average Vehicle Trip Ends
T = 40.19 * 6.000 — 123 entering 118 exiting

123 + 118 = 241

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday — Directional Distribution: 52% ent. 48% exit.
T = 32.67 (X) — T = 196 Average Vehicle Trip Ends
T = 32.67 * 6.000 — 102 entering 94 exiting

102 + 94 = 196

Weekday (900 Series page 157)

Average Weekday — Directional Distribution: 50% entering, 50% exiting
T = 470.95 (X) — T = 2826 Average Vehicle Trip Ends
T = 470.95 * 6.000 — 1413 entering 1413 exiting

1413 + 1413 = 2826

Saturday Peak Hour of Generator (900 Series page 163)

Directional Distribution: 51% ent. 49% exit.
T = 54.86 (X) — T = 329 Average Vehicle Trip Ends
T = 54.86 * 6.000 — 168 entering 161 exiting

168 + 161 = 329

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour = 51% Non-Pass By — PM Peak Hour = 50% Non-Pass By

	IN	Out	Total
AM Peak	63	60	123
PM Peak	51	47	98
Daily	707	707	1414

PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour = 49% Pass By — PM Peak Hour = 50% Pass By

	IN	Out	Total
AM Peak	60	58	118
PM Peak	51	47	98
Daily	706	706	1412

PM Peak Hour Rate Applied to Daily

Kimley»Horn

Project	Parker and Pine				
Subject	Trip Generation for Gasoline/Service Station with Convenience Market				
Designed by	JRP	*Date*	October 07, 2019	*Job No.*	096502001
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Gasoline/Service Station with Convenience Market (945)

Independant Variable - Vehicle Fueling Positions (X)

Vehicle Fueling Positions= 16 Positions
X = 16
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 369)

Average Weekday
T = 12.47 (X)
T = 12.47 * 16

Directional Distribution: 51% ent. 49% exit.
T = 200 Average Vehicle Trip Ends
102 entering 98 exiting

102 + 98 = 200

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 370)

Average Weekday
T = 13.99 (X)
T = 13.99 * 16.000

Directional Distribution: 51% ent. 49% exit.
T = 224 Average Vehicle Trip Ends
114 entering 110 exiting

114 + 110 = 224

Weekday (900 Series page 368)

Average Weekday
T = 205.36 (X)
T = 205.36 * 16.000

Directional Distribution: 50% entering, 50% exiting
T = 3286 Average Vehicle Trip Ends
1643 entering 1643 exiting

1643 + 1643 = 3286

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 44% Non-Pass By AM Peak Hour = 38% Non-Pass By

	IN	Out	Total	
AM Peak	39	37	76	
PM Peak	50	48	99	
Daily	723	723	1446	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 56% Pass By AM Peak Hour = 62% Pass By

	IN	Out	Total	
AM Peak	63	61	124	
PM Peak	64	62	125	
Daily	920	920	1840	PM Peak Hour Rate Applied to Daily

Kimley»Horn

Project	Parker and Pine				
Subject	Trip Generation for Automated Car Wash				
Designed by	JRP	*Date*	October 07, 2019	*Job No.*	096502001
Checked by		*Date*		*Sheet No.*	1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Automated Car Wash (948)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = 6,900

X = 6.9

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Utilized PM Peak Hour Rates)

Directional Distribution: 50% ent. 50% exit.

T = 14.20(X) T = 97 Average Vehicle Trip Ends

T = 14.20 * 6.9 49 entering 49 exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 382)

Directional Distribution: 50% ent. 50% exit.

T = 14.20(X) T = 97 Average Vehicle Trip Ends

T = 14.20 * 6.9 49 entering 49 exiting

Weekday (10% K-Factor from PM Peak Hour)

Average Weekday

Directional Distribution: 50% entering, 50% exiting

T = 970 Average Vehicle Trip Ends

(T) = PM Peak Total / K Factor 0.1 485 entering 485 exiting

485 + 485 = 970

Parker and Pine Trip Generation Summary - 2019 Study

Land Use	Quantity	Daily Trips	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Total Trips								
Mid-Rise Multifamily Residential (ITE 221)	175 Units	952	15	44	59	46	30	76
Day Care Center (ITE 565)	13,000 SF	620	74	69	143	68	77	145
Shopping Center (ITE 820)	17,000 SF	642	10	6	16	31	34	65
Fast Food Restaurant w/ D.T. (ITE 934)	6,000 SF	2,826	123	118	241	102	94	196
Gas Station w/ Convenience (ITE 945)	16 Positions	3,286	102	98	200	114	110	224
Automated Car Wash (ITE 948)	6,900 SF	970	49	49	98	49	49	98
Total	-	9,296	373	384	757	410	394	804
Total Trips After Internal Capture (ITE Methodology)								
Mid-Rise Multifamily Residential (ITE 221)	175 Units	576	14	35	49	18	11	29
Day Care Center (ITE 565)	13,000 SF	530	69	60	129	55	62	117
Shopping Center (ITE 820)	17,000 SF	548	9	5	14	24	28	52
Fast Food Restaurant w/ D.T. (ITE 934)	6,000 SF	1,908	85	100	185	66	48	114
Gas Station w/ Convenience (ITE 945)	16 Positions	2,804	95	85	180	91	90	181
Automated Car Wash (ITE 948)	6,900 SF	828	45	43	88	39	40	79
Total	-	7,194	317	328	645	293	279	572
Non Pass-By Trips								
Mid-Rise Multifamily Residential (ITE 221)	175 Units	288	14	35	49	18	11	29
Day Care Center (ITE 565)	13,000 SF	212	69	60	129	55	62	117
Shopping Center (ITE 820)	17,000 SF	368	9	5	14	16	18	34
Fast Food Restaurant w/ D.T. (ITE 934)	6,000 SF	1,338	43	51	94	33	24	57
Gas Station w/ Convenience (ITE 945)	16 Positions	1,794	36	32	68	40	40	80
Automated Car Wash (ITE 948)	6,900 SF	720	45	43	88	39	40	79
Total	-	4,720	216	226	442	201	195	396
Pass-By Trips								
Shopping Center (ITE 820)	17,000 SF	180	0	0	0	8	10	18
Fast Food Restaurant w/ D.T. (ITE 934)	6,000 SF	570	42	49	91	33	24	57
Gas Station w/ Convenience (ITE 945)	16 Positions	1,010	59	53	112	51	50	101
Total	-	2,474	101	102	203	92	84	176

Trip Generation Planner (ITE 10th Edition) - Summary Report

Kimley»Horn

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Parker and Pine**
Project Number **096502001**

ITE Code	Internal Capture Land Use	Land Use Description	Independent Variable	Setting/Location	No. of Units	Avg Rate or Eq	Rates: Daily Rate	Rates: AM Rate	Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Internal Capture: Daily Trips	Net Trips after Internal Capture: AM Trips	Net Trips after Internal Capture: PM Trips	Net Trips after Internal Capture: AM Trips In	Net Trips after Internal Capture: AM Trips Out	Net Trips after Internal Capture: PM Trips In	Net Trips after Internal Capture: PM Trips Out	Net Trips after Internal Capture & Pass-By: Daily Trips	Net Trips after Internal Capture & Pass-By: AM Trips	Net Trips after Internal Capture & Pass-By: PM Trips	Net Trips after Internal Capture & Pass-By: AM Trips In	Net Trips after Internal Capture & Pass-By: AM Trips Out	Net Trips after Internal Capture & Pass-By: PM Trips In	Net Trips after Internal Capture & Pass-By: PM Trips Out
221	Residential	Multifamily Housing (Mid-Rise)	Dwelling Unit(s)	General Urban/Suburban	175	Eq	N/A	N/A	N/A	952	59	76	15	44	46	30	576	49	29	14	35	18	11	576	49	29	14	35	18	11
565	Retail	Day Care Center	1,000 Sq Ft	General Urban/Suburban	13	Avg	47.62	11.00	11.12	620	143	145	74	69	68	77	530	129	117	69	60	55	62	530	129	117	69	60	55	63
820	Retail	Shopping Center	1,000 Sq Ft GLA	General Urban/Suburban	17	Avg	37.75	0.94	3.81	642	16	65	10	6	31	34	548	14	52	9	5	25	28	548	15	35	9	5	16	18
934	Restaurant	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft	General Urban/Suburban	6	Avg	470.95	40.19	32.67	2,826	241	196	123	118	102	94	1,908	185	114	85	100	66	48	1,908	94	57	43	51	33	24
945	Retail	Gasoline Station w/ Convenience Market	Fueling Position(s)	General Urban/Suburban	16	Avg	205.36	12.47	13.99	3,286	200	224	102	98	114	110	2,804	180	181	95	85	91	89	2,804	68	80	36	32	40	39
948	Retail	Automated Car Wash	1,000 Sq Ft	General Urban/Suburban	6.9	Avg	*	*	14.20	970	98	98	49	49	49	49	828	88	79	45	43	39	40	828	88	79	46	43	39	40
	Select Use																													
	Select Use																													
		Total Office	1,000 Sq Ft																										
		Total Retail	1,000 Sq Ft		**52.9**					5,518	457	532	235	222	262	270	4,706	411	429	218	193	210	219							
		Total Restaurant	1,000 Sq Ft		**6**					2,826	241	196	123	118	102	94	1,907	185	114	85	100	66	48							
	Subtotal before Internal Capture	**Total Ciema/Entertainment**	Screen(s)																										
		Total Residential	Dwelling Unit(s)		**175**					952	59	76	15	44	46	30	576	49	29	14	35	18	11							
		Total Hotel	Room(s)																										
		Total Other																											
									Grand Total	9,296	757	804	373	384	410	394	7,194	645	572	317	328	294	278	7,194	443	396	217	226	201	195

Notes:
(1) AM and/or PM rates correspond to peak hour of generator
(2) Land use was removed in *Trip Generation, 10 Edition,* trip generation data from the ITE *Trip Generation, 9th Edition*

A Trip Generation data from ITE *Trip Generation, 10th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 3rd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 3rd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation 9th Edition*
H Enter data in shaded cells of column A
I ITE Codes entered on first 8 rows of table are assumed to be part of mixed use and will be used in calculation of internal capture.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Parker and Pine	**Organization:**	Kimley-Horn and Associates, Inc.
Project Location:		**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office		-	1,000 Sq Ft	0	0	0
Retail		53	1,000 Sq Ft	457	235	222
Restaurant		6	1,000 Sq Ft	241	123	118
Cinema/Entertainment		-	Screen(s)	0	0	0
Residential		175	Dwelling Unit(s)	59	15	44
Hotel		-	Room(s)	0	0	0
All Other Land Uses[2]		-	0	0	0	0
				757	373	384

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment	1.00	0%	0%	1.00	0%	0%
Residential	1.00	0%	0%	1.00	0%	0%
Hotel	1.00	0%	0%	1.00	0%	0%
All Other Land Uses[2]	1.00	0%	0%	1.00	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		29	0	0	0
Restaurant	0	17		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	9	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	757	373	384
Internal Capture Percentage	15%	15%	15%
External Vehicle-Trips[5]	645	317	328
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	7%	13%
Restaurant	31%	15%
Cinema/Entertainment	N/A	N/A
Residential	7%	20%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	Parker and Pine
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	235	235	1.00	222	222
Restaurant	1.00	123	123	1.00	118	118
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	15	15	1.00	44.23367736	44
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	64		29	0	31	0
Restaurant	37	17		0	5	4
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	9	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		75	28	0	0	0
Retail	0		62	0	0	0
Restaurant	0	19		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	40	25	0		0
Hotel	0	9	7	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	17	218	235	218	0	0
Restaurant	38	85	123	85	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	14	15	14	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	29	193	222	193	0	0
Restaurant	18	100	118	100	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	9	35	44	35	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Parker and Pine	**Organization:**	Kimley-Horn and Associates, Inc.
Project Location:		**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office		-	1,000 Sq Ft	0	0	0
Retail		53	1,000 Sq Ft	532	262	270
Restaurant		6	1,000 Sq Ft	196	102	94
Cinema/Entertainment		-	Screen(s)	0	0	0
Residential		175	Dwelling Unit(s)	76	46	30
Hotel		-	Room(s)	0	0	0
All Other Land Uses[2]		-	0	0	0	0
				804	410	394

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment	1.00	0%	0%	1.00	0%	0%
Residential	1.00	0%	0%	1.00	0%	0%
Hotel	1.00	0%	0%	1.00	0%	0%
All Other Land Uses[2]	1.00	0%	0%	1.00	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		30	0	21	0
Restaurant	0	39		0	7	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	13	6	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	804	410	394
Internal Capture Percentage	29%	28%	29%
External Vehicle-Trips[5]	572	294	278
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	20%	19%
Restaurant	35%	49%
Cinema/Entertainment	N/A	N/A
Residential	61%	63%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	Parker and Pine
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	262	262	1.00	270	270
Restaurant	1.00	102	102	1.00	94	94
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	46	46	1.00	29.80729552	30
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	5		78	11	70	14
Restaurant	3	39		8	17	7
Cinema/Entertainment	0	0	0		0	0
Residential	1	13	6	0		1
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		21	2	0	2	0
Retail	0		30	0	21	0
Restaurant	0	131		0	7	0
Cinema/Entertainment	0	10	3		2	0
Residential	0	26	14	0		0
Hotel	0	5	5	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	52	210	262	210	0	0
Restaurant	36	66	102	66	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	28	18	46	18	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	51	219	270	219	0	0
Restaurant	46	48	94	48	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	19	11	30	11	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

APPENDIX E

Intersection Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	244	159	77	94	316	209	109	3179	84	57	1590	270
Future Volume (veh/h)	244	159	77	94	316	209	109	3179	84	57	1590	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	298	227	0	171	400	0	131	3382	0	74	1656	0
Peak Hour Factor	0.82	0.70	0.77	0.55	0.79	0.84	0.83	0.94	0.58	0.77	0.96	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	253	485		224	456		157	3188		124	2921	
Arrive On Green	0.02	0.05	0.00	0.02	0.04	0.00	0.09	0.62	0.00	0.05	0.76	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	298	227	0	171	400	0	131	3382	0	74	1656	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	9.5	8.1	0.0	6.4	14.6	0.0	9.4	81.2	0.0	2.7	17.7	0.0
Cycle Q Clear(g_c), s	9.5	8.1	0.0	6.4	14.6	0.0	9.4	81.2	0.0	2.7	17.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	253	485		224	456		157	3188		124	2921	
V/C Ratio(X)	1.18	0.47		0.76	0.88		0.83	1.06		0.60	0.57	
Avail Cap(c_a), veh/h	253	485		253	465		240	3188		133	2921	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	0.97	0.97	0.00	0.96	0.96	0.00	0.42	0.42	0.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	63.4	57.5	0.0	62.6	61.2	0.0	58.3	24.4	0.0	61.0	8.8	0.0
Incr Delay (d2), s/veh	113.4	0.7	0.0	11.1	16.4	0.0	6.4	31.0	0.0	6.2	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	3.9	0.0	3.3	8.0	0.0	4.5	39.4	0.0	1.3	4.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	176.8	58.2	0.0	73.7	77.6	0.0	64.8	55.4	0.0	67.2	9.6	0.0
LnGrp LOS	F	E		E	E		E	F		E	A	
Approach Vol, veh/h		525	A		571	A		3513	A		1730	A
Approach Delay, s/veh		125.5			76.4			55.8			12.0	
Approach LOS		F			E			E			B	

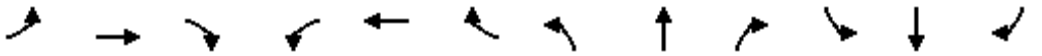
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	85.7	12.9	22.2	16.0	78.9	14.0	21.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	80.5	9.5	17.0	17.5	68.0	9.5	17.0
Max Q Clear Time (g_c+I1), s	4.7	83.2	8.4	10.1	11.4	19.7	11.5	16.6
Green Ext Time (p_c), s	0.0	0.0	0.1	0.7	0.1	19.6	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	51.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	299	162	138	139	172	85	76	2180	96	115	2852	489
Future Volume (veh/h)	299	162	138	139	172	85	76	2180	96	115	2852	489
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	340	188	0	153	207	0	88	2295	0	131	2940	0
Peak Hour Factor	0.88	0.86	0.75	0.91	0.83	0.85	0.86	0.95	0.73	0.88	0.97	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	359	435		207	279		97	3198		183	3190	
Arrive On Green	0.03	0.04	0.00	0.04	0.05	0.00	0.11	1.00	0.00	0.04	0.42	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	340	188	0	153	207	0	88	2295	0	131	2940	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	12.8	6.7	0.0	5.7	7.5	0.0	6.3	0.0	0.0	4.9	70.9	0.0
Cycle Q Clear(g_c), s	12.8	6.7	0.0	5.7	7.5	0.0	6.3	0.0	0.0	4.9	70.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	359	435		207	279		97	3198		183	3190	
V/C Ratio(X)	0.95	0.43		0.74	0.74		0.90	0.72		0.72	0.92	
Avail Cap(c_a), veh/h	359	563		290	492		97	3198		242	3190	
HCM Platoon Ratio	0.33	0.33	0.33	0.67	0.67	0.67	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	0.97	0.97	0.00	0.98	0.98	0.00	0.78	0.78	0.00	0.72	0.72	0.00
Uniform Delay (d), s/veh	62.4	58.0	0.0	61.4	60.3	0.0	57.6	0.0	0.0	61.7	34.8	0.0
Incr Delay (d2), s/veh	33.4	0.7	0.0	6.0	3.8	0.0	52.4	1.1	0.0	4.8	4.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	3.2	0.0	2.7	3.6	0.0	4.1	0.3	0.0	2.3	31.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.8	58.6	0.0	67.3	64.1	0.0	110.0	1.1	0.0	66.5	39.1	0.0
LnGrp LOS	F	E		E	E		F	A		E	D	
Approach Vol, veh/h		528	A		360	A		2383	A		3071	A
Approach Delay, s/veh		82.6			65.5			5.1			40.2	
Approach LOS		F			E			A			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	85.9	12.3	20.4	11.6	85.7	18.0	14.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.1	71.4	10.9	20.6	7.1	73.4	13.5	18.0
Max Q Clear Time (g_c+I1), s	6.9	2.0	7.7	8.7	8.3	72.9	14.8	9.5
Green Ext Time (p_c), s	0.1	40.3	0.1	0.8	0.0	0.5	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	169	82	100	335	222	116	3374	89	61	1688	287
Future Volume (veh/h)	259	169	82	100	335	222	116	3374	89	61	1688	287
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	305	225	0	133	394	0	136	3589	0	76	1758	0
Peak Hour Factor	0.85	0.75	0.85	0.75	0.85	0.85	0.85	0.94	0.65	0.80	0.96	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	474		188	301		163	3256		124	2974	
Arrive On Green	0.03	0.04	0.00	0.02	0.03	0.00	0.09	0.64	0.00	0.07	1.00	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	305	225	0	133	394	0	136	3589	0	76	1758	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	11.4	8.0	0.0	5.0	11.0	0.0	9.8	82.9	0.0	2.8	0.0	0.0
Cycle Q Clear(g_c), s	11.4	8.0	0.0	5.0	11.0	0.0	9.8	82.9	0.0	2.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	357	474		188	301		163	3256		124	2974	
V/C Ratio(X)	0.85	0.47		0.71	1.31		0.84	1.10		0.61	0.59	
Avail Cap(c_a), veh/h	359	474		332	301		267	3256		133	2974	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.96	0.96	0.00	0.96	0.96	0.00	0.42	0.42	0.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	61.8	57.7	0.0	62.8	63.2	0.0	58.1	23.6	0.0	59.4	0.0	0.0
Incr Delay (d2), s/veh	17.2	0.7	0.0	4.6	160.7	0.0	5.1	48.4	0.0	7.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	3.8	0.0	2.4	12.0	0.0	4.6	45.2	0.0	1.3	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.0	58.4	0.0	67.4	223.9	0.0	63.2	72.0	0.0	66.4	0.8	0.0
LnGrp LOS	E	E		E	F		E	F		E	A	
Approach Vol, veh/h		530	A		527	A		3725	A		1834	A
Approach Delay, s/veh		70.3			184.4			71.6			3.6	
Approach LOS		E			F			E			A	

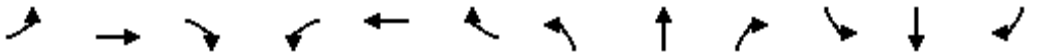
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	87.4	11.6	21.8	16.4	80.2	17.9	15.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	82.5	12.5	12.0	19.5	68.0	13.5	11.0
Max Q Clear Time (g_c+I1), s	4.8	84.9	7.0	10.0	11.8	2.0	13.4	13.0
Green Ext Time (p_c), s	0.0	0.0	0.2	0.2	0.2	24.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	61.6
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	172	146	148	183	90	81	2314	102	122	3027	519
Future Volume (veh/h)	317	172	146	148	183	90	81	2314	102	122	3027	519
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	352	191	0	163	215	0	90	2436	0	136	3121	0
Peak Hour Factor	0.90	0.90	0.75	0.91	0.85	0.85	0.90	0.95	0.75	0.90	0.97	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	364	437		217	286		97	3173		188	3172	
Arrive On Green	0.03	0.04	0.00	0.06	0.08	0.00	0.11	1.00	0.00	0.02	0.20	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	352	191	0	163	215	0	90	2436	0	136	3121	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	13.2	6.8	0.0	6.0	7.7	0.0	6.5	0.0	0.0	5.1	79.1	0.0
Cycle Q Clear(g_c), s	13.2	6.8	0.0	6.0	7.7	0.0	6.5	0.0	0.0	5.1	79.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	364	437		217	286		97	3173		188	3172	
V/C Ratio(X)	0.97	0.44		0.75	0.75		0.93	0.77		0.72	0.98	
Avail Cap(c_a), veh/h	364	558		300	492		97	3173		202	3172	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.96	0.96	0.00	0.98	0.98	0.00	0.78	0.78	0.00	0.72	0.72	0.00
Uniform Delay (d), s/veh	62.5	58.0	0.0	59.9	58.5	0.0	57.6	0.0	0.0	62.9	51.0	0.0
Incr Delay (d2), s/veh	37.3	0.7	0.0	6.6	3.9	0.0	57.9	1.4	0.0	8.3	10.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	3.2	0.0	2.8	3.6	0.0	4.3	0.4	0.0	2.5	39.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.8	58.6	0.0	66.5	62.4	0.0	115.5	1.4	0.0	71.2	61.4	0.0
LnGrp LOS	F	E		E	E		F	A		E	E	
Approach Vol, veh/h		543	A		378	A		2526	A		3257	A
Approach Delay, s/veh		85.3			64.2			5.5			61.8	
Approach LOS		F			E			A			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.6	85.3	12.7	20.5	11.6	85.3	18.2	14.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	72.7	11.3	20.4	7.1	73.2	13.7	18.0
Max Q Clear Time (g_c+I1), s	7.1	2.0	8.0	8.8	8.5	81.1	15.2	9.7
Green Ext Time (p_c), s	0.0	45.1	0.1	0.8	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	42.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	403	182	82	106	342	219	233	3323	88	60	1742	320
Future Volume (veh/h)	403	182	82	106	342	219	233	3323	88	60	1742	320
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	438	198	0	115	372	0	253	3535	0	65	1815	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.96	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	469		168	301		279	3298		120	2678	
Arrive On Green	0.03	0.04	0.00	0.02	0.03	0.00	0.16	0.65	0.00	0.05	0.70	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	438	198	0	115	372	0	253	3535	0	65	1815	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	12.5	7.1	0.0	4.3	11.0	0.0	18.2	84.0	0.0	2.4	26.5	0.0
Cycle Q Clear(g_c), s	12.5	7.1	0.0	4.3	11.0	0.0	18.2	84.0	0.0	2.4	26.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	332	469		168	301		279	3298		120	2678	
V/C Ratio(X)	1.32	0.42		0.68	1.24		0.91	1.07		0.54	0.68	
Avail Cap(c_a), veh/h	332	469		306	301		308	3298		133	2678	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	0.00	0.96	0.96	0.00	1.00	1.00	0.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	62.9	57.3	0.0	63.0	63.2	0.0	53.9	23.0	0.0	61.0	13.4	0.0
Incr Delay (d2), s/veh	162.9	0.6	0.0	4.6	131.1	0.0	27.6	39.0	0.0	3.6	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.4	3.3	0.0	2.0	10.8	0.0	10.3	42.7	0.0	1.1	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	225.8	57.9	0.0	67.6	194.3	0.0	81.5	62.0	0.0	64.6	14.7	0.0
LnGrp LOS	F	E		E	F		F	F		E	B	
Approach Vol, veh/h		636	A		487	A		3788	A		1880	A
Approach Delay, s/veh		173.6			164.4			63.3			16.5	
Approach LOS		F			F			E			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	88.5	10.8	21.7	24.8	72.7	17.0	15.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	83.5	11.5	12.0	22.5	66.0	12.5	11.0
Max Q Clear Time (g_c+I1), s	4.4	86.0	6.3	9.1	20.2	28.5	14.5	13.0
Green Ext Time (p_c), s	0.0	0.0	0.1	0.3	0.2	20.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	67.9
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	423	185	146	154	188	89	172	2285	100	120	3077	551
Future Volume (veh/h)	423	185	146	154	188	89	172	2285	100	120	3077	551
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	460	201	0	167	204	0	187	2405	0	130	3172	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.97	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	359	417		221	275		103	3208		180	3179	
Arrive On Green	0.03	0.04	0.00	0.06	0.08	0.00	0.12	1.00	0.00	0.05	0.62	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	460	201	0	167	204	0	187	2405	0	130	3172	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	13.5	7.2	0.0	6.2	7.3	0.0	7.5	0.0	0.0	4.8	80.5	0.0
Cycle Q Clear(g_c), s	13.5	7.2	0.0	6.2	7.3	0.0	7.5	0.0	0.0	4.8	80.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	359	417		221	275		103	3208		180	3179	
V/C Ratio(X)	1.28	0.48		0.76	0.74		1.82	0.75		0.72	1.00	
Avail Cap(c_a), veh/h	359	560		306	506		103	3208		199	3179	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.98	0.98	0.00	1.00	1.00	0.00	0.72	0.72	0.00
Uniform Delay (d), s/veh	62.8	58.6	0.0	59.8	58.7	0.0	57.5	0.0	0.0	60.7	24.4	0.0
Incr Delay (d2), s/veh	146.6	0.9	0.0	6.7	3.9	0.0	404.3	1.7	0.0	8.0	13.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	3.4	0.0	2.9	3.4	0.0	14.7	0.5	0.0	2.3	33.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	209.3	59.5	0.0	66.6	62.6	0.0	461.8	1.7	0.0	68.6	37.5	0.0
LnGrp LOS	F	E		E	E		F	A		E	D	
Approach Vol, veh/h		661	A		371	A		2592	A		3302	A
Approach Delay, s/veh		163.8			64.4			34.9			38.7	
Approach LOS		F			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	86.2	12.8	19.7	12.0	85.4	18.0	14.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	72.5	11.5	20.5	7.5	72.5	13.5	18.5
Max Q Clear Time (g_c+I1), s	6.8	2.0	8.2	9.2	9.5	82.5	15.5	9.3
Green Ext Time (p_c), s	0.0	44.0	0.2	0.8	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	50.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	321	209	101	124	416	275	143	4183	111	75	2092	355
Future Volume (veh/h)	321	209	101	124	416	275	143	4183	111	75	2092	355
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	321	209	0	124	416	0	143	4183	0	75	2092	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	306	486		179	355		199	4100		124	3959	
Arrive On Green	0.03	0.05	0.00	0.02	0.03	0.00	0.04	0.43	0.00	0.07	1.00	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	6696	0	3456	6696	0
Grp Volume(v), veh/h	321	209	0	124	416	0	143	4183	0	75	2092	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1609	0	1728	1609	0
Q Serve(g_s), s	11.5	7.4	0.0	4.6	13.0	0.0	5.3	82.8	0.0	2.7	0.0	0.0
Cycle Q Clear(g_c), s	11.5	7.4	0.0	4.6	13.0	0.0	5.3	82.8	0.0	2.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	306	486		179	355		199	4100		124	3959	
V/C Ratio(X)	1.05	0.43		0.69	1.17		0.72	1.02		0.60	0.53	
Avail Cap(c_a), veh/h	306	486		332	355		385	4100		133	3959	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.67	0.67	0.67	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	0.96	0.96	0.00	1.00	1.00	0.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	63.1	57.1	0.0	62.9	62.9	0.0	61.4	37.3	0.0	59.4	0.0	0.0
Incr Delay (d2), s/veh	65.2	0.6	0.0	4.6	101.9	0.0	4.8	19.5	0.0	6.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	3.5	0.0	2.2	11.3	0.0	2.5	39.1	0.0	1.3	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	128.3	57.7	0.0	67.5	164.8	0.0	66.2	56.7	0.0	66.0	0.5	0.0
LnGrp LOS	F	E		E	F		E	F		E	A	
Approach Vol, veh/h		530	A		540	A		4326	A		2167	A
Approach Delay, s/veh		100.5			142.4			57.1			2.8	
Approach LOS		F			F			E			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	87.3	11.2	22.3	12.0	84.5	16.0	17.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	82.5	12.5	12.0	14.5	73.0	11.5	13.0
Max Q Clear Time (g_c+I1), s	4.7	84.8	6.6	9.4	7.3	2.0	13.5	15.0
Green Ext Time (p_c), s	0.0	0.0	0.2	0.3	0.2	34.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	50.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	393	213	182	183	226	112	100	2868	126	151	3752	643
Future Volume (veh/h)	393	213	182	183	226	112	100	2868	126	151	3752	643
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	393	213	0	183	226	0	100	2868	0	151	3752	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	407		226	298		147	4014		199	4111	
Arrive On Green	0.03	0.04	0.00	0.07	0.08	0.00	0.09	1.00	0.00	0.06	0.64	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	6696	0	3456	6696	0
Grp Volume(v), veh/h	393	213	0	183	226	0	100	2868	0	151	3752	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1609	0	1728	1609	0
Q Serve(g_s), s	12.5	7.6	0.0	6.8	8.1	0.0	3.7	0.0	0.0	5.6	65.7	0.0
Cycle Q Clear(g_c), s	12.5	7.6	0.0	6.8	8.1	0.0	3.7	0.0	0.0	5.6	65.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	332	407		226	298		147	4014		199	4111	
V/C Ratio(X)	1.18	0.52		0.81	0.76		0.68	0.71		0.76	0.91	
Avail Cap(c_a), veh/h	332	615		226	506		199	4014		199	4111	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.98	0.98	0.00	1.00	1.00	0.00	0.72	0.72	0.00
Uniform Delay (d), s/veh	62.9	59.1	0.0	60.0	58.3	0.0	58.6	0.0	0.0	60.4	20.3	0.0
Incr Delay (d2), s/veh	108.7	1.0	0.0	19.1	3.9	0.0	5.4	1.1	0.0	11.4	3.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	3.7	0.0	3.6	3.8	0.0	1.7	0.3	0.0	2.8	23.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	171.7	60.1	0.0	79.0	62.2	0.0	64.0	1.1	0.0	71.7	23.4	0.0
LnGrp LOS	F	E		E	E		E	A		E	C	
Approach Vol, veh/h		606	A		409	A		2968	A		3903	A
Approach Delay, s/veh		132.5			69.7			3.2			25.3	
Approach LOS		F			E			A			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	85.6	13.0	19.4	10.0	87.6	17.0	15.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	73.5	8.5	22.5	7.5	73.5	12.5	18.5
Max Q Clear Time (g_c+I1), s	7.6	2.0	8.8	9.6	5.7	67.7	14.5	10.1
Green Ext Time (p_c), s	0.0	57.4	0.0	1.0	0.0	5.8	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	465	222	101	130	423	272	260	4132	110	74	2146	388
Future Volume (veh/h)	465	222	101	130	423	272	260	4132	110	74	2146	388
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	465	222	0	130	423	0	260	4132	0	74	2146	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	453		184	301		315	4150		124	3793	
Arrive On Green	0.03	0.04	0.00	0.02	0.03	0.00	0.09	0.64	0.00	0.07	1.00	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	6696	0	3456	6696	0
Grp Volume(v), veh/h	465	222	0	130	423	0	260	4132	0	74	2146	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1609	0	1728	1609	0
Q Serve(g_s), s	12.5	7.9	0.0	4.9	11.0	0.0	9.6	82.8	0.0	2.7	0.0	0.0
Cycle Q Clear(g_c), s	12.5	7.9	0.0	4.9	11.0	0.0	9.6	82.8	0.0	2.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	332	453		184	301		315	4150		124	3793	
V/C Ratio(X)	1.40	0.49		0.70	1.41		0.82	1.00		0.60	0.57	
Avail Cap(c_a), veh/h	332	453		306	301		385	4150		133	3793	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	0.96	0.96	0.00	1.00	1.00	0.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	62.9	58.1	0.0	62.8	63.2	0.0	58.0	22.9	0.0	59.4	0.0	0.0
Incr Delay (d2), s/veh	197.1	0.8	0.0	4.7	201.1	0.0	11.5	13.0	0.0	6.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.9	3.8	0.0	2.3	13.7	0.0	4.7	32.4	0.0	1.3	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	260.0	59.0	0.0	67.5	264.3	0.0	69.5	35.9	0.0	65.6	0.6	0.0
LnGrp LOS	F	E		E	F		E	D		E	A	
Approach Vol, veh/h		687	A		553	A		4392	A		2220	A
Approach Delay, s/veh		195.0			218.0			37.9			2.8	
Approach LOS		F			F			D			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	88.3	11.4	21.1	16.4	81.1	17.0	15.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	83.5	11.5	12.0	14.5	74.0	12.5	11.0
Max Q Clear Time (g_c+I1), s	4.7	84.8	6.9	9.9	11.6	2.0	14.5	13.0
Green Ext Time (p_c), s	0.0	0.0	0.1	0.2	0.3	36.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	54.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	499	226	182	189	231	111	191	2839	124	149	3802	675
Future Volume (veh/h)	499	226	182	189	231	111	191	2839	124	149	3802	675
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	499	226	0	189	231	0	191	2839	0	149	3802	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	359	423		243	303		199	3956		199	3955	
Arrive On Green	0.03	0.04	0.00	0.07	0.09	0.00	0.12	1.00	0.00	0.06	0.61	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	6696	0	3456	6696	0
Grp Volume(v), veh/h	499	226	0	189	231	0	191	2839	0	149	3802	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1609	0	1728	1609	0
Q Serve(g_s), s	13.5	8.1	0.0	7.0	8.3	0.0	7.1	0.0	0.0	5.5	72.3	0.0
Cycle Q Clear(g_c), s	13.5	8.1	0.0	7.0	8.3	0.0	7.1	0.0	0.0	5.5	72.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	359	423		243	303		199	3956		199	3955	
V/C Ratio(X)	1.39	0.53		0.78	0.76		0.96	0.72		0.75	0.96	
Avail Cap(c_a), veh/h	359	560		306	506		199	3956		199	3955	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.98	0.98	0.00	1.00	1.00	0.00	0.72	0.72	0.00
Uniform Delay (d), s/veh	62.8	58.9	0.0	59.4	58.2	0.0	57.3	0.0	0.0	60.3	23.6	0.0
Incr Delay (d2), s/veh	192.1	1.1	0.0	9.4	3.9	0.0	51.6	1.1	0.0	10.7	6.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.9	3.9	0.0	3.4	3.9	0.0	4.4	0.3	0.0	2.7	27.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	254.8	60.0	0.0	68.9	62.1	0.0	108.9	1.1	0.0	71.0	29.6	0.0
LnGrp LOS	F	E		E	E		F	A		E	C	
Approach Vol, veh/h		725	A		420	A		3030	A		3951	A
Approach Delay, s/veh		194.1			65.1			7.9			31.2	
Approach LOS		F			E			A			C	

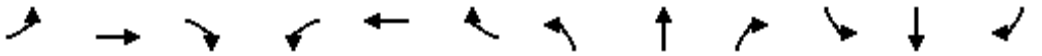
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	84.4	13.6	20.0	12.0	84.4	18.0	15.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	72.5	11.5	20.5	7.5	72.5	13.5	18.5
Max Q Clear Time (g_c+I1), s	7.5	2.0	9.0	10.1	9.1	74.3	15.5	10.3
Green Ext Time (p_c), s	0.0	56.0	0.1	0.9	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	38.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



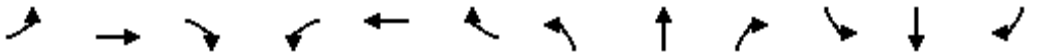
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	278	143	210	469	8	313	11	180	14	8	7
Future Volume (veh/h)	3	278	143	210	469	8	313	11	180	14	8	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	366	0	309	494	0	360	16	0	24	16	0
Peak Hour Factor	0.38	0.76	0.81	0.68	0.95	0.50	0.87	0.69	0.75	0.58	0.50	0.44
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	378	1202		563	1650		659	1298		394	760	
Arrive On Green	0.01	0.34	0.00	0.27	0.93	0.00	0.17	0.37	0.00	0.02	0.21	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	8	366	0	309	494	0	360	16	0	24	16	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.4	9.9	0.0	14.9	1.8	0.0	19.7	0.4	0.0	1.4	0.5	0.0
Cycle Q Clear(g_c), s	0.4	9.9	0.0	14.9	1.8	0.0	19.7	0.4	0.0	1.4	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	378	1202		563	1650		659	1298		394	760	
V/C Ratio(X)	0.02	0.30		0.55	0.30		0.55	0.01		0.06	0.02	
Avail Cap(c_a), veh/h	436	1202		740	1650		822	1298		430	760	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.74	0.74	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.8	31.7	0.0	18.1	2.6	0.0	29.1	26.3	0.0	38.4	40.3	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.6	0.3	0.0	0.7	0.0	0.0	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.4	0.0	4.8	0.6	0.0	8.5	0.2	0.0	0.6	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	32.4	0.0	18.7	2.9	0.0	29.8	26.3	0.0	38.5	40.4	0.0
LnGrp LOS	C	C		B	A		C	C		D	D	
Approach Vol, veh/h		374	A		803	A		376	A		40	A
Approach Delay, s/veh		32.3			9.0			29.6			39.3	
Approach LOS		C			A			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	52.0	22.1	48.5	27.1	32.3	5.8	64.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	47.5	30.5	28.5	34.5	18.5	5.5	53.5
Max Q Clear Time (g_c+I1), s	3.4	2.4	16.9	11.9	21.7	2.5	2.4	3.8
Green Ext Time (p_c), s	0.0	0.1	0.8	2.1	0.9	0.0	0.0	3.8

Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



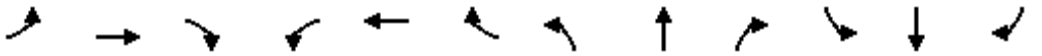
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	355	284	353	372	8	190	9	177	45	23	17
Future Volume (veh/h)	8	355	284	353	372	8	190	9	177	45	23	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	438	0	364	404	0	211	16	0	60	28	0
Peak Hour Factor	0.67	0.81	0.87	0.97	0.92	0.67	0.90	0.56	0.87	0.75	0.82	0.71
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	494	1500		636	1964		499	916		381	656	
Arrive On Green	0.01	0.42	0.00	0.29	1.00	0.00	0.11	0.26	0.00	0.04	0.18	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	12	438	0	364	404	0	211	16	0	60	28	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.5	10.6	0.0	15.6	0.0	0.0	12.0	0.4	0.0	3.5	0.8	0.0
Cycle Q Clear(g_c), s	0.5	10.6	0.0	15.6	0.0	0.0	12.0	0.4	0.0	3.5	0.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	494	1500		636	1964		499	916		381	656	
V/C Ratio(X)	0.02	0.29		0.57	0.21		0.42	0.02		0.16	0.04	
Avail Cap(c_a), veh/h	559	1500		907	1964		610	916		416	656	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.86	0.86	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.8	24.8	0.0	12.9	0.0	0.0	35.1	36.0	0.0	40.7	43.6	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.7	0.2	0.0	0.6	0.0	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.6	0.0	4.6	0.1	0.0	5.3	0.2	0.0	1.6	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	25.3	0.0	13.6	0.2	0.0	35.6	36.0	0.0	40.9	43.7	0.0
LnGrp LOS	C	C		B	A		D	D		D	D	
Approach Vol, veh/h		450	A		768	A		227	A		88	A
Approach Delay, s/veh		25.1			6.6			35.7			41.8	
Approach LOS		C			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	38.0	23.2	59.4	18.9	28.5	6.3	76.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	33.5	38.5	32.5	22.5	18.5	6.5	64.5
Max Q Clear Time (g_c+I1), s	5.5	2.4	17.6	12.6	14.0	2.8	2.5	2.0
Green Ext Time (p_c), s	0.0	0.0	1.1	2.8	0.4	0.1	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	18.3
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



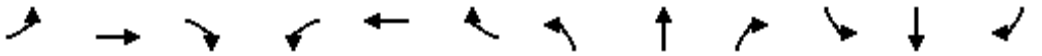
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	295	152	223	498	8	332	12	191	15	8	7
Future Volume (veh/h)	3	295	152	223	498	8	332	12	191	15	8	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	388	0	328	524	0	382	17	0	26	16	0
Peak Hour Factor	0.38	0.76	0.81	0.68	0.95	0.50	0.87	0.69	0.75	0.58	0.50	0.44
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	363	1176		561	1657		661	1288		376	709	
Arrive On Green	0.01	0.33	0.00	0.29	0.93	0.00	0.19	0.36	0.00	0.02	0.20	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	8	388	0	328	524	0	382	17	0	26	16	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.4	10.7	0.0	16.0	1.8	0.0	21.3	0.4	0.0	1.5	0.5	0.0
Cycle Q Clear(g_c), s	0.4	10.7	0.0	16.0	1.8	0.0	21.3	0.4	0.0	1.5	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	363	1176		561	1657		661	1288		376	709	
V/C Ratio(X)	0.02	0.33		0.58	0.32		0.58	0.01		0.07	0.02	
Avail Cap(c_a), veh/h	421	1176		735	1657		802	1288		409	709	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.47	0.47	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	32.7	0.0	18.1	2.4	0.0	29.7	26.6	0.0	39.8	41.8	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.5	0.2	0.0	0.8	0.0	0.0	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.8	0.0	5.0	0.6	0.0	9.3	0.2	0.0	0.7	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	33.4	0.0	18.5	2.6	0.0	30.5	26.6	0.0	39.9	41.9	0.0
LnGrp LOS	C	C		B	A		C	C		D	D	
Approach Vol, veh/h		396	A		852	A		399	A		42	A
Approach Delay, s/veh		33.3			8.8			30.3			40.7	
Approach LOS		C			A			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	51.6	23.3	47.5	28.7	30.5	5.8	65.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	47.1	31.5	27.9	34.5	18.1	5.5	53.9
Max Q Clear Time (g_c+I1), s	3.5	2.4	18.0	12.7	23.3	2.5	2.4	3.8
Green Ext Time (p_c), s	0.0	0.1	0.8	2.2	0.9	0.0	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



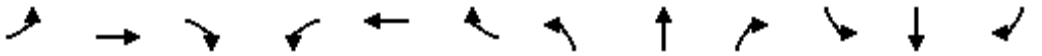
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	377	301	375	395	8	202	10	188	48	24	18
Future Volume (veh/h)	8	377	301	375	395	8	202	10	188	48	24	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	465	0	387	429	0	224	18	0	64	29	0
Peak Hour Factor	0.67	0.81	0.87	0.97	0.92	0.67	0.90	0.56	0.87	0.75	0.82	0.71
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	1482		635	1982		494	888		368	613	
Arrive On Green	0.01	0.42	0.00	0.31	1.00	0.00	0.12	0.25	0.00	0.04	0.17	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	12	465	0	387	429	0	224	18	0	64	29	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.5	11.4	0.0	16.9	0.0	0.0	13.0	0.5	0.0	3.8	0.9	0.0
Cycle Q Clear(g_c), s	0.5	11.4	0.0	16.9	0.0	0.0	13.0	0.5	0.0	3.8	0.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	479	1482		635	1982		494	888		368	613	
V/C Ratio(X)	0.03	0.31		0.61	0.22		0.45	0.02		0.17	0.05	
Avail Cap(c_a), veh/h	530	1482		902	1982		579	888		399	613	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.84	0.84	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.2	25.4	0.0	12.8	0.0	0.0	35.9	36.7	0.0	41.8	44.9	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.8	0.2	0.0	0.7	0.0	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.0	0.0	4.8	0.1	0.0	5.8	0.2	0.0	1.7	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	26.0	0.0	13.6	0.2	0.0	36.5	36.8	0.0	42.0	45.0	0.0
LnGrp LOS	C	C		B	A		D	D		D	D	
Approach Vol, veh/h		477	A		816	A		242	A		93	A
Approach Delay, s/veh		25.9			6.6			36.5			42.9	
Approach LOS		C			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	37.0	24.5	58.7	19.8	26.9	6.3	77.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	32.5	39.5	32.5	21.5	18.5	5.5	66.5
Max Q Clear Time (g_c+I1), s	5.8	2.5	18.9	13.4	15.0	2.9	2.5	2.0
Green Ext Time (p_c), s	0.0	0.1	1.2	3.0	0.3	0.1	0.0	3.2

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



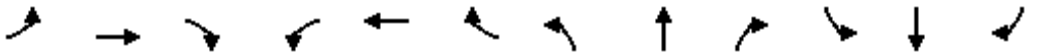
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	306	163	223	503	13	350	19	191	19	14	7
Future Volume (veh/h)	3	306	163	223	503	13	350	19	191	19	14	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	403	0	328	529	0	402	28	0	33	28	0
Peak Hour Factor	0.38	0.76	0.81	0.68	0.95	0.50	0.87	0.69	0.75	0.58	0.50	0.44
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	358	1161		551	1645		663	1288		370	685	
Arrive On Green	0.01	0.33	0.00	0.29	0.93	0.00	0.20	0.36	0.00	0.03	0.19	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	8	403	0	328	529	0	402	28	0	33	28	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.4	11.2	0.0	16.1	2.1	0.0	22.6	0.7	0.0	1.9	0.8	0.0
Cycle Q Clear(g_c), s	0.4	11.2	0.0	16.1	2.1	0.0	22.6	0.7	0.0	1.9	0.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	358	1161		551	1645		663	1288		370	685	
V/C Ratio(X)	0.02	0.35		0.60	0.32		0.61	0.02		0.09	0.04	
Avail Cap(c_a), veh/h	416	1161		723	1645		786	1288		397	685	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.7	33.2	0.0	18.3	2.7	0.0	29.8	26.6	0.0	40.3	42.7	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	1.0	0.5	0.0	1.0	0.0	0.0	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.0	0.0	5.2	0.7	0.0	9.8	0.3	0.0	0.9	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	34.0	0.0	19.4	3.2	0.0	30.8	26.7	0.0	40.4	42.8	0.0
LnGrp LOS	C	C		B	A		C	C		D	D	
Approach Vol, veh/h		411	A		857	A		430	A		61	A
Approach Delay, s/veh		33.9			9.4			30.5			41.5	
Approach LOS		C			A			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	51.6	23.4	47.0	30.0	29.6	5.8	64.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	47.1	31.5	27.9	34.5	18.1	5.5	53.9
Max Q Clear Time (g_c+I1), s	3.9	2.7	18.1	13.2	24.6	2.8	2.4	4.1
Green Ext Time (p_c), s	0.0	0.1	0.8	2.3	0.9	0.1	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



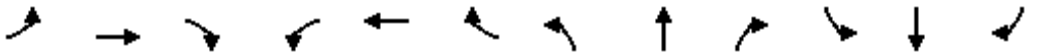
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	387	311	375	399	12	218	16	188	52	30	18
Future Volume (veh/h)	8	387	311	375	399	12	218	16	188	52	30	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	478	0	387	434	0	242	29	0	69	37	0
Peak Hour Factor	0.67	0.81	0.87	0.97	0.92	0.67	0.90	0.56	0.87	0.75	0.82	0.71
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	465	1436		620	1945		507	916		374	622	
Arrive On Green	0.01	0.40	0.00	0.31	1.00	0.00	0.13	0.26	0.00	0.04	0.18	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	12	478	0	387	434	0	242	29	0	69	37	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.5	12.0	0.0	17.2	0.0	0.0	14.0	0.8	0.0	4.1	1.1	0.0
Cycle Q Clear(g_c), s	0.5	12.0	0.0	17.2	0.0	0.0	14.0	0.8	0.0	4.1	1.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	465	1436		620	1945		507	916		374	622	
V/C Ratio(X)	0.03	0.33		0.62	0.22		0.48	0.03		0.18	0.06	
Avail Cap(c_a), veh/h	516	1436		868	1945		592	916		400	622	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.2	26.7	0.0	13.4	0.0	0.0	35.2	36.1	0.0	41.3	44.7	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	1.0	0.3	0.0	0.7	0.1	0.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.3	0.0	4.9	0.1	0.0	6.2	0.4	0.0	1.8	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	27.3	0.0	14.5	0.3	0.0	35.9	36.2	0.0	41.6	44.9	0.0
LnGrp LOS	C	C		B	A		D	D		D	D	
Approach Vol, veh/h		490	A		821	A		271	A		106	A
Approach Delay, s/veh		27.2			7.0			35.9			42.7	
Approach LOS		C			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	38.0	24.9	57.0	20.8	27.3	6.3	75.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	33.5	38.5	32.5	22.5	18.5	5.5	65.5
Max Q Clear Time (g_c+I1), s	6.1	2.8	19.2	14.0	16.0	3.1	2.5	2.0
Green Ext Time (p_c), s	0.0	0.1	1.1	3.0	0.4	0.1	0.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



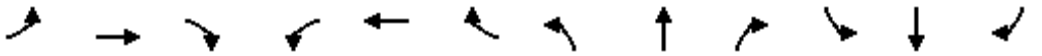
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	306	163	223	503	13	350	19	191	19	14	7
Future Volume (veh/h)	3	306	163	223	503	13	350	19	191	19	14	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	403	0	328	529	0	402	28	0	33	28	0
Peak Hour Factor	0.38	0.76	0.81	0.68	0.95	0.50	0.87	0.69	0.75	0.58	0.50	0.44
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	386	1275		393	1645		663	1288		370	685	
Arrive On Green	0.01	0.36	0.00	0.23	0.93	0.00	0.20	0.36	0.00	0.03	0.19	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	8	403	0	328	529	0	402	28	0	33	28	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.4	10.7	0.0	11.8	2.1	0.0	22.6	0.7	0.0	1.9	0.8	0.0
Cycle Q Clear(g_c), s	0.4	10.7	0.0	11.8	2.1	0.0	22.6	0.7	0.0	1.9	0.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	386	1275		393	1645		663	1288		370	685	
V/C Ratio(X)	0.02	0.32		0.83	0.32		0.61	0.02		0.09	0.04	
Avail Cap(c_a), veh/h	444	1275		784	1645		786	1288		397	685	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.0	30.1	0.0	49.0	2.7	0.0	29.8	26.6	0.0	40.3	42.7	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.0	4.7	0.5	0.0	1.0	0.0	0.0	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.7	0.0	4.8	0.7	0.0	9.8	0.3	0.0	0.9	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	30.8	0.0	53.7	3.2	0.0	30.8	26.7	0.0	40.4	42.8	0.0
LnGrp LOS	C	C		D	A		C	C		D	D	
Approach Vol, veh/h		411	A		857	A		430	A		61	A
Approach Delay, s/veh		30.7			22.5			30.5			41.5	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	51.6	19.3	51.1	30.0	29.6	5.8	64.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	47.1	29.5	29.9	34.5	18.1	5.5	53.9
Max Q Clear Time (g_c+I1), s	3.9	2.7	13.8	12.7	24.6	2.8	2.4	4.1
Green Ext Time (p_c), s	0.0	0.1	1.0	2.4	0.9	0.1	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



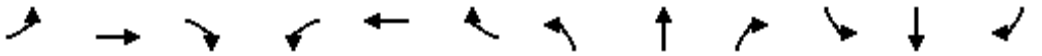
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	387	311	375	399	12	218	16	188	52	30	18
Future Volume (veh/h)	8	387	311	375	399	12	218	16	188	52	30	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	478	0	387	434	0	242	29	0	69	37	0
Peak Hour Factor	0.67	0.81	0.87	0.97	0.92	0.67	0.90	0.56	0.87	0.75	0.82	0.71
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	489	1523		456	1945		507	916		374	622	
Arrive On Green	0.01	0.43	0.00	0.26	1.00	0.00	0.13	0.26	0.00	0.04	0.18	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	12	478	0	387	434	0	242	29	0	69	37	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.5	11.5	0.0	13.8	0.0	0.0	14.0	0.8	0.0	4.1	1.1	0.0
Cycle Q Clear(g_c), s	0.5	11.5	0.0	13.8	0.0	0.0	14.0	0.8	0.0	4.1	1.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	489	1523		456	1945		507	916		374	622	
V/C Ratio(X)	0.02	0.31		0.85	0.22		0.48	0.03		0.18	0.06	
Avail Cap(c_a), veh/h	540	1523		1023	1945		592	916		400	622	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.4	24.5	0.0	46.6	0.0	0.0	35.2	36.1	0.0	41.3	44.7	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	4.5	0.3	0.0	0.7	0.1	0.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.0	0.0	5.5	0.1	0.0	6.2	0.4	0.0	1.8	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	25.1	0.0	51.1	0.3	0.0	35.9	36.2	0.0	41.6	44.9	0.0
LnGrp LOS	C	C		D	A		D	D		D	D	
Approach Vol, veh/h		490	A		821	A		271	A		106	A
Approach Delay, s/veh		24.9			24.2			35.9			42.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	38.0	21.7	60.2	20.8	27.3	6.3	75.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	33.5	38.5	32.5	22.5	18.5	5.5	65.5
Max Q Clear Time (g_c+I1), s	6.1	2.8	15.8	13.5	16.0	3.1	2.5	2.0
Green Ext Time (p_c), s	0.0	0.1	1.4	3.0	0.4	0.1	0.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



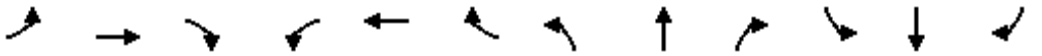
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	366	188	276	617	11	412	14	237	18	11	9
Future Volume (veh/h)	4	366	188	276	617	11	412	14	237	18	11	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	431	0	300	649	0	448	19	0	24	15	0
Peak Hour Factor	0.75	0.85	0.85	0.92	0.95	0.75	0.92	0.75	0.85	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	342	1312		372	1672		674	1288		320	573	
Arrive On Green	0.01	0.37	0.00	0.11	0.47	0.00	0.22	0.36	0.00	0.02	0.16	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	5	431	0	300	649	0	448	19	0	24	15	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.2	11.3	0.0	11.0	15.4	0.0	26.2	0.4	0.0	1.4	0.5	0.0
Cycle Q Clear(g_c), s	0.2	11.3	0.0	11.0	15.4	0.0	26.2	0.4	0.0	1.4	0.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	342	1312		372	1672		674	1288		320	573	
V/C Ratio(X)	0.01	0.33		0.81	0.39		0.66	0.01		0.08	0.03	
Avail Cap(c_a), veh/h	406	1312		837	1672		749	1288		355	573	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.4	29.4	0.0	56.7	22.3	0.0	31.3	26.6	0.0	43.9	45.9	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.0	4.2	0.7	0.0	1.9	0.0	0.0	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.0	0.0	5.0	6.6	0.0	11.6	0.2	0.0	0.7	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	30.1	0.0	60.8	23.0	0.0	33.2	26.6	0.0	44.0	46.0	0.0
LnGrp LOS	C	C		E	C		C	C		D	D	
Approach Vol, veh/h		436	A		949	A		467	A		39	A
Approach Delay, s/veh		30.0			34.9			33.0			44.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	51.6	18.5	52.5	33.5	25.4	5.3	65.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	47.1	31.5	27.9	34.5	18.1	5.5	53.9
Max Q Clear Time (g_c+I1), s	3.4	2.4	13.0	13.3	28.2	2.5	2.2	17.4
Green Ext Time (p_c), s	0.0	0.1	1.0	2.4	0.8	0.0	0.0	5.1

Intersection Summary	
HCM 6th Ctrl Delay	33.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



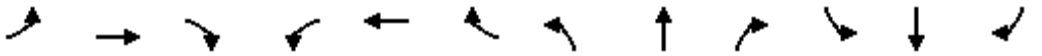
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	467	374	464	489	11	250	12	233	59	30	22
Future Volume (veh/h)	11	467	374	464	489	11	250	12	233	59	30	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	508	0	478	532	0	278	16	0	79	35	0
Peak Hour Factor	0.75	0.92	0.92	0.97	0.92	0.75	0.90	0.75	0.90	0.75	0.85	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	430	1409		563	1930		518	899		365	564	
Arrive On Green	0.02	0.40	0.00	0.16	0.54	0.00	0.14	0.25	0.00	0.05	0.16	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	15	508	0	478	532	0	278	16	0	79	35	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.6	13.1	0.0	17.5	10.5	0.0	16.4	0.4	0.0	4.8	1.1	0.0
Cycle Q Clear(g_c), s	0.6	13.1	0.0	17.5	10.5	0.0	16.4	0.4	0.0	4.8	1.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	430	1409		563	1930		518	899		365	564	
V/C Ratio(X)	0.03	0.36		0.85	0.28		0.54	0.02		0.22	0.06	
Avail Cap(c_a), veh/h	471	1409		1077	1930		556	899		369	564	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.6	27.6	0.0	52.9	15.9	0.0	35.9	36.4	0.0	42.7	46.5	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.0	3.7	0.4	0.0	0.9	0.0	0.0	0.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.7	0.0	7.9	4.4	0.0	7.3	0.2	0.0	2.2	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	28.3	0.0	56.6	16.3	0.0	36.8	36.5	0.0	43.0	46.7	0.0
LnGrp LOS	C	C		E	B		D	D		D	D	
Approach Vol, veh/h		523	A		1010	A		294	A		114	A
Approach Delay, s/veh		28.2			35.4			36.8			44.1	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	37.4	25.7	56.0	23.2	25.1	6.6	75.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.7	32.9	40.5	31.9	21.5	18.1	5.1	67.3
Max Q Clear Time (g_c+I1), s	6.8	2.4	19.5	15.1	18.4	3.1	2.6	12.5
Green Ext Time (p_c), s	0.0	0.0	1.7	3.1	0.3	0.1	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	34.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



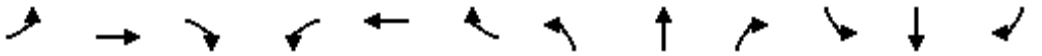
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	377	199	276	622	16	430	21	237	22	17	9
Future Volume (veh/h)	4	377	199	276	622	16	430	21	237	22	17	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	444	0	300	655	0	467	28	0	29	23	0
Peak Hour Factor	0.75	0.85	0.85	0.92	0.95	0.75	0.92	0.75	0.85	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	337	1303		372	1663		677	1288		313	547	
Arrive On Green	0.01	0.37	0.00	0.11	0.47	0.00	0.23	0.36	0.00	0.02	0.15	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	5	444	0	300	655	0	467	28	0	29	23	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.2	11.8	0.0	11.0	15.6	0.0	27.6	0.7	0.0	1.8	0.7	0.0
Cycle Q Clear(g_c), s	0.2	11.8	0.0	11.0	15.6	0.0	27.6	0.7	0.0	1.8	0.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	337	1303		372	1663		677	1288		313	547	
V/C Ratio(X)	0.01	0.34		0.81	0.39		0.69	0.02		0.09	0.04	
Avail Cap(c_a), veh/h	401	1303		837	1663		734	1288		343	547	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.7	29.8	0.0	56.7	22.6	0.0	31.5	26.6	0.0	44.6	46.8	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.0	4.2	0.7	0.0	2.5	0.0	0.0	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.2	0.0	5.0	6.7	0.0	12.3	0.3	0.0	0.8	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	30.5	0.0	60.8	23.3	0.0	34.0	26.7	0.0	44.7	47.0	0.0
LnGrp LOS	C	C		E	C		C	C		D	D	
Approach Vol, veh/h		449	A		955	A		495	A		52	A
Approach Delay, s/veh		30.5			35.1			33.6			45.7	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	51.6	18.5	52.2	34.8	24.5	5.3	65.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	47.1	31.5	27.9	34.5	18.1	5.5	53.9
Max Q Clear Time (g_c+I1), s	3.8	2.7	13.0	13.8	29.6	2.7	2.2	17.6
Green Ext Time (p_c), s	0.0	0.1	1.0	2.5	0.7	0.0	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	477	384	464	493	15	266	18	233	63	36	22
Future Volume (veh/h)	11	477	384	464	493	15	266	18	233	63	36	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	518	0	478	536	0	296	24	0	84	42	0
Peak Hour Factor	0.75	0.92	0.92	0.97	0.92	0.75	0.90	0.75	0.90	0.75	0.85	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	426	1400		563	1922		521	899		358	541	
Arrive On Green	0.02	0.39	0.00	0.16	0.54	0.00	0.15	0.25	0.00	0.05	0.15	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	15	518	0	478	536	0	296	24	0	84	42	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.7	13.4	0.0	17.5	10.6	0.0	17.6	0.7	0.0	5.1	1.3	0.0
Cycle Q Clear(g_c), s	0.7	13.4	0.0	17.5	10.6	0.0	17.6	0.7	0.0	5.1	1.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	426	1400		563	1922		521	899		358	541	
V/C Ratio(X)	0.04	0.37		0.85	0.28		0.57	0.03		0.23	0.08	
Avail Cap(c_a), veh/h	468	1400		1077	1922		544	899		358	541	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.8	27.9	0.0	52.9	16.1	0.0	36.1	36.5	0.0	43.2	47.3	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	3.7	0.4	0.0	1.3	0.1	0.0	0.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.9	0.0	7.9	4.4	0.0	7.9	0.3	0.0	2.3	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	28.7	0.0	56.6	16.5	0.0	37.4	36.6	0.0	43.6	47.5	0.0
LnGrp LOS	C	C		E	B		D	D		D	D	
Approach Vol, veh/h		533	A		1014	A		320	A		126	A
Approach Delay, s/veh		28.5			35.4			37.3			44.9	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	37.4	25.7	55.7	24.3	24.3	6.6	74.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.7	32.9	40.5	31.9	21.5	18.1	5.1	67.3
Max Q Clear Time (g_c+I1), s	7.1	2.7	19.5	15.4	19.6	3.3	2.7	12.6
Green Ext Time (p_c), s	0.0	0.1	1.7	3.2	0.2	0.1	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	34.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	502	21	169	727	20	165
Future Vol, veh/h	502	21	169	727	20	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	546	23	184	790	22	179

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	569	0	1321	285
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	763	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1301	-	*292	*884
Stage 1	-	-	-	-	*827	-
Stage 2	-	-	-	-	*743	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1301	-	*251	*884
Mov Cap-2 Maneuver	-	-	-	-	*398	-
Stage 1	-	-	-	-	*711	-
Stage 2	-	-	-	-	*743	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	781	-	-	1301	-
HCM Lane V/C Ratio	0.257	-	-	0.141	-
HCM Control Delay (s)	11.2	-	-	8.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	1	-	-	0.5	-

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

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	629	21	138	772	17	126
Future Vol, veh/h	629	21	138	772	17	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	684	23	150	839	18	137

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	707	0	1416	354
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	720	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1222	-	*259	*836
Stage 1	-	-	-	-	*777	-
Stage 2	-	-	-	-	*720	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1222	-	*227	*836
Mov Cap-2 Maneuver	-	-	-	-	*386	-
Stage 1	-	-	-	-	*681	-
Stage 2	-	-	-	-	*720	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	734	-	-	1222	-
HCM Lane V/C Ratio	0.212	-	-	0.123	-
HCM Control Delay (s)	11.2	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.4	-

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

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	625	21	169	903	20	165
Future Vol, veh/h	625	21	169	903	20	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	679	23	184	982	22	179

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	702	0	1550	351
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	859	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1228	-	154	*836
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	375	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1228	-	131	*836
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	665	-
Stage 2	-	-	-	-	375	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	586	-	-	1228	-
HCM Lane V/C Ratio	0.343	-	-	0.15	-
HCM Control Delay (s)	14.3	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	0.5	-

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

Intersection	
Int Delay, s/veh	1.5

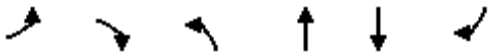
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	781	21	138	960	17	126
Future Vol, veh/h	781	21	138	960	17	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	849	23	150	1043	18	137

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	872	0	1683	436
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	822	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	*1142	-	*139	*763
Stage 1	-	-	-	-	*720	-
Stage 2	-	-	-	-	*392	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*1142	-	*121	*763
Mov Cap-2 Maneuver	-	-	-	-	*200	-
Stage 1	-	-	-	-	*626	-
Stage 2	-	-	-	-	*392	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	572	-	-	* 1142	-
HCM Lane V/C Ratio	0.272	-	-	0.131	-
HCM Control Delay (s)	13.6	-	-	8.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	1.1	-	-	0.5	-

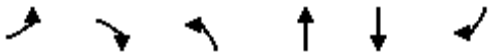
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	96	0	3645	1842	87
Future Volume (Veh/h)	0	96	0	3645	1842	87
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	104	0	3962	2002	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				865	463	
pX, platoon unblocked	0.54	0.73	0.73			
vC, conflicting volume	3323	667	2097			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	1225			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	87	100			
cM capacity (veh/h)	548	796	414			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	104	1321	1321	1321	667	667	667	95
Volume Left	0	0	0	0	0	0	0	0
Volume Right	104	0	0	0	0	0	0	95
cSH	796	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.13	0.78	0.78	0.78	0.39	0.39	0.39	0.06
Queue Length 95th (ft)	11	0	0	0	0	0	0	0
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	10.2	0.0			0.0			
Approach LOS	B							

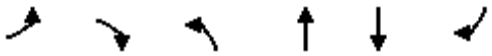
Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	73.8%	ICU Level of Service		D
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	96	0	2559	3281	96
Future Volume (Veh/h)	0	96	0	2559	3281	96
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	104	0	2782	3566	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				857	471	
pX, platoon unblocked	0.56	0.45	0.45			
vC, conflicting volume	4493	1189	3670			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1932	0	2661			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	79	100			
cM capacity (veh/h)	32	489	70			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	104	927	927	927	1189	1189	1189	104
Volume Left	0	0	0	0	0	0	0	0
Volume Right	104	0	0	0	0	0	0	104
cSH	489	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.21	0.55	0.55	0.55	0.70	0.70	0.70	0.06
Queue Length 95th (ft)	20	0	0	0	0	0	0	0
Control Delay (s)	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B							
Approach Delay (s)	14.3	0.0			0.0			
Approach LOS	B							

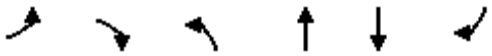
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	96	0	4503	2290	87
Future Volume (Veh/h)	0	96	0	4503	2290	87
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	104	0	4895	2489	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				865	463	
pX, platoon unblocked	0.72	0.73	0.73			
vC, conflicting volume	3760	670	2584			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	1341			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	87	100			
cM capacity (veh/h)	737	795	374			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	104	1224	1224	1224	1224	711	711	711	451
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	104	0	0	0	0	0	0	0	95
cSH	795	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.13	0.72	0.72	0.72	0.72	0.42	0.42	0.42	0.27
Queue Length 95th (ft)	11	0	0	0	0	0	0	0	0
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B								
Approach Delay (s)	10.2	0.0				0.0			
Approach LOS	B								

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	96	0	3157	4077	96
Future Volume (Veh/h)	0	96	0	3157	4077	96
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	104	0	3432	4432	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				857	471	
pX, platoon unblocked	0.53	0.45	0.45			
vC, conflicting volume	5342	1160	4536			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2109	0	2739			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	79	100			
cM capacity (veh/h)	23	487	65			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	104	858	858	858	858	1266	1266	1266	737
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	104	0	0	0	0	0	0	0	104
cSH	487	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.21	0.50	0.50	0.50	0.50	0.74	0.74	0.74	0.43
Queue Length 95th (ft)	20	0	0	0	0	0	0	0	0
Control Delay (s)	14.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B								
Approach Delay (s)	14.4	0.0				0.0			
Approach LOS	B								

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	73.3%	ICU Level of Service		D
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	23	0	25	0	535	22	17	383	0
Future Vol, veh/h	0	0	0	23	0	25	0	535	22	17	383	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	125	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	25	0	27	0	582	24	18	416	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	826	1034	291	-	0	0	606	0	0
Stage 1	582	582	-	-	-	-	-	-	-
Stage 2	244	452	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	310	231	706	0	-	-	968	-	-
Stage 1	522	497	-	0	-	-	-	-	-
Stage 2	774	569	-	0	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	304	0	706	-	-	-	968	-	-
Mov Cap-2 Maneuver	304	0	-	-	-	-	-	-	-
Stage 1	512	0	-	-	-	-	-	-	-
Stage 2	774	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.5	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	432	968	-	-
HCM Lane V/C Ratio	-	-	0.121	0.019	-	-
HCM Control Delay (s)	-	-	14.5	8.8	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	20	0	21	0	400	20	16	701	0
Future Vol, veh/h	0	0	0	20	0	21	0	400	20	16	701	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	125	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	22	0	23	0	435	22	17	762	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	850	1231	218	-	0	0	457	0	0
Stage 1	435	435	-	-	-	-	-	-	-
Stage 2	415	796	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	300	176	786	0	-	-	1100	-	-
Stage 1	620	579	-	0	-	-	-	-	-
Stage 2	635	397	-	0	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	296	0	786	-	-	-	1100	-	-
Mov Cap-2 Maneuver	296	0	-	-	-	-	-	-	-
Stage 1	611	0	-	-	-	-	-	-	-
Stage 2	635	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	435	1100	-	-
HCM Lane V/C Ratio	-	-	0.102	0.016	-	-
HCM Control Delay (s)	-	-	14.2	8.3	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	23	0	25	0	663	22	17	475	0
Future Vol, veh/h	0	0	0	23	0	25	0	663	22	17	475	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	125	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	25	0	27	0	721	24	18	516	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1015	1273	361	-	0	0	745	0	0
Stage 1	721	721	-	-	-	-	-	-	-
Stage 2	294	552	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	234	166	636	0	-	-	859	-	-
Stage 1	443	430	-	0	-	-	-	-	-
Stage 2	730	513	-	0	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	229	0	636	-	-	-	859	-	-
Mov Cap-2 Maneuver	229	0	-	-	-	-	-	-	-
Stage 1	434	0	-	-	-	-	-	-	-
Stage 2	730	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.4	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	343	859	-	-
HCM Lane V/C Ratio	-	-	0.152	0.022	-	-
HCM Control Delay (s)	-	-	17.4	9.3	-	-
HCM Lane LOS	-	-	C	A	-	-
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	20	0	21	0	496	20	16	868	0
Future Vol, veh/h	0	0	0	20	0	21	0	496	20	16	868	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	125	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	22	0	23	0	539	22	17	943	0

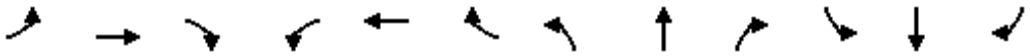
Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1045	1516	270	-	0	0	561	0	0
Stage 1	539	539	-	-	-	-	-	-	-
Stage 2	506	977	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	224	118	728	0	-	-	1006	-	-
Stage 1	549	520	-	0	-	-	-	-	-
Stage 2	571	327	-	0	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	220	0	728	-	-	-	1006	-	-
Mov Cap-2 Maneuver	220	0	-	-	-	-	-	-	-
Stage 1	540	0	-	-	-	-	-	-	-
Stage 2	571	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.1	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	342	1006	-	-
HCM Lane V/C Ratio	-	-	0.13	0.017	-	-
HCM Control Delay (s)	-	-	17.1	8.6	-	-
HCM Lane LOS	-	-	C	A	-	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-	-

APPENDIX F

Queue Analysis Worksheets



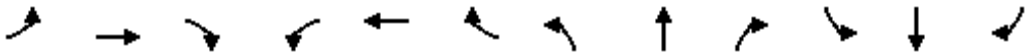
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	438	198	89	115	372	238	253	3535	96	65	1815	348
v/c Ratio	0.92	0.38	0.06	0.45	1.24	0.15	0.88	1.13	0.08	0.49	0.75	0.33
Control Delay	89.9	46.0	0.1	62.3	189.6	0.2	69.7	89.6	3.3	73.5	27.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.9	46.0	0.1	62.3	189.6	0.2	69.7	89.6	3.3	73.5	27.4	7.4
Queue Length 50th (ft)	197	68	0	49	~210	0	217	~1276	9	28	385	76
Queue Length 95th (ft)	#294	103	0	80	#316	0	m#278	#1353	m19	54	423	116
Internal Link Dist (ft)		455			1855			383			2158	
Turn Bay Length (ft)	175		50	325		50	625			550		
Base Capacity (vph)	475	525	1583	448	299	1583	306	3125	1252	132	2415	1061
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.38	0.06	0.26	1.24	0.15	0.83	1.13	0.08	0.49	0.75	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



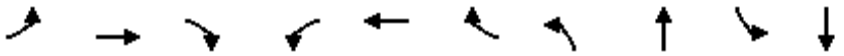
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	460	201	159	167	204	97	187	2405	109	130	3172	586
v/c Ratio	0.79	0.32	0.10	0.54	0.59	0.06	0.94	0.91	0.10	0.51	1.30	0.52
Control Delay	64.4	58.5	0.1	62.8	78.0	0.1	100.8	28.6	1.3	60.3	164.9	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	58.5	0.1	62.8	78.0	0.1	100.8	28.6	1.3	60.3	164.9	7.0
Queue Length 50th (ft)	204	87	0	74	94	0	~170	412	0	55	~1246	104
Queue Length 95th (ft)	259	128	0	104	125	0	m#356	m#826	m10	m85	#1321	140
Internal Link Dist (ft)		455			1855			391			2158	
Turn Bay Length (ft)	175		50	325		50	625			550		
Base Capacity (vph)	620	636	1583	567	503	1583	200	2644	1170	254	2444	1139
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.32	0.10	0.29	0.41	0.06	0.94	0.91	0.09	0.51	1.30	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



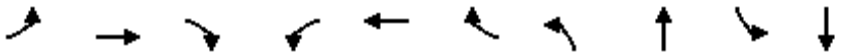
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	465	222	101	130	423	272	260	4242	74	2534
v/c Ratio	1.01	0.45	0.06	0.48	1.41	0.17	0.73	1.07	0.56	0.75
Control Delay	100.1	47.3	0.1	65.5	254.5	0.2	61.2	62.8	77.9	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.1	47.3	0.1	65.5	254.5	0.2	61.2	62.8	77.9	22.1
Queue Length 50th (ft)	~192	74	0	57	~257	0	113	~1167	32	388
Queue Length 95th (ft)	#310	133	0	88	#368	0	m146	#1213	#60	416
Internal Link Dist (ft)		455			1855			383		2158
Turn Bay Length (ft)	175		50	325		50	625		550	
Base Capacity (vph)	462	496	1583	435	299	1583	382	3949	132	3391
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.45	0.06	0.30	1.41	0.17	0.68	1.07	0.56	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



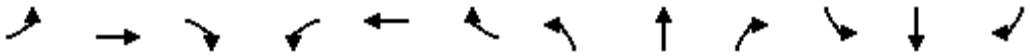
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	499	226	182	189	231	111	191	2963	149	4477
v/c Ratio	0.93	0.38	0.11	0.57	0.62	0.07	0.65	0.89	0.58	1.39
Control Delay	78.5	60.0	0.1	65.1	75.0	0.1	66.7	26.1	63.9	201.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	60.0	0.1	65.1	75.0	0.1	66.7	26.1	63.9	201.9
Queue Length 50th (ft)	225	99	0	85	102	0	82	416	63	~1475
Queue Length 95th (ft)	#321	143	0	115	135	0	m#147	m440	m98	#1496
Internal Link Dist (ft)		455			1855			391		2158
Turn Bay Length (ft)	175		50	325		50	625		550	
Base Capacity (vph)	541	591	1583	488	503	1583	296	3338	257	3230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.38	0.11	0.39	0.46	0.07	0.65	0.89	0.58	1.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

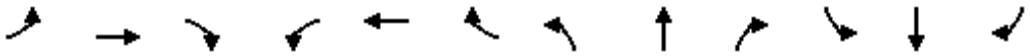
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	8	403	201	328	529	26	402	28	255	33	28	16
v/c Ratio	0.02	0.40	0.13	0.45	0.40	0.03	0.75	0.02	0.28	0.07	0.04	0.02
Control Delay	10.7	20.1	0.2	10.7	13.9	1.7	25.6	16.9	2.7	12.0	19.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	20.1	0.2	10.7	13.9	1.7	25.6	16.9	2.7	12.0	19.9	0.0
Queue Length 50th (ft)	2	66	0	52	110	1	114	4	0	7	4	0
Queue Length 95th (ft)	3	84	0	m46	m150	m1	#198	10	19	14	7	0
Internal Link Dist (ft)		1748			385			464			469	
Turn Bay Length (ft)	275		50	175		150	200		50	225		150
Base Capacity (vph)	372	1012	1583	733	1339	878	538	1192	903	445	794	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.40	0.13	0.45	0.40	0.03	0.75	0.02	0.28	0.07	0.04	0.02

Intersection Summary

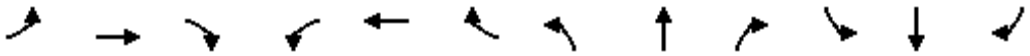
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	478	357	387	434	18	242	29	216	69	37	25
v/c Ratio	0.03	0.37	0.23	0.45	0.27	0.02	0.41	0.02	0.25	0.15	0.04	0.04
Control Delay	17.2	32.1	0.3	16.4	18.8	0.0	27.2	29.2	4.8	24.4	38.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	32.1	0.3	16.4	18.8	0.0	27.2	29.2	4.8	24.4	38.7	0.1
Queue Length 50th (ft)	5	154	0	75	97	0	133	8	16	34	12	0
Queue Length 95th (ft)	12	188	0	m92	m126	m0	200	12	52	54	26	0
Internal Link Dist (ft)		1748			385			462			469	
Turn Bay Length (ft)	275		50	175		150	200		50	225		150
Base Capacity (vph)	411	1281	1583	1212	1619	910	655	1250	1096	456	914	614
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.37	0.23	0.32	0.27	0.02	0.37	0.02	0.20	0.15	0.04	0.04

Intersection Summary

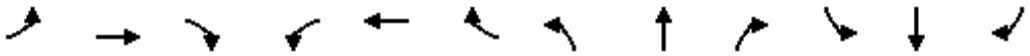
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	444	234	300	655	21	467	28	279	29	23	12
v/c Ratio	0.02	0.60	0.15	0.40	0.47	0.02	0.75	0.02	0.28	0.10	0.06	0.02
Control Delay	11.8	28.8	0.2	8.3	10.4	0.1	23.1	16.7	1.9	13.6	27.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	28.8	0.2	8.3	10.4	0.1	23.1	16.7	1.9	13.6	27.8	0.1
Queue Length 50th (ft)	1	83	0	32	80	0	134	4	0	6	4	0
Queue Length 95th (ft)	5	#130	0	m41	m116	m0	#231	10	24	16	12	0
Internal Link Dist (ft)		1748			385			464			469	
Turn Bay Length (ft)	275		50	175		150	200		50	225		150
Base Capacity (vph)	494	735	1583	870	1383	942	645	1225	1071	302	393	700
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.60	0.15	0.34	0.47	0.02	0.72	0.02	0.26	0.10	0.06	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



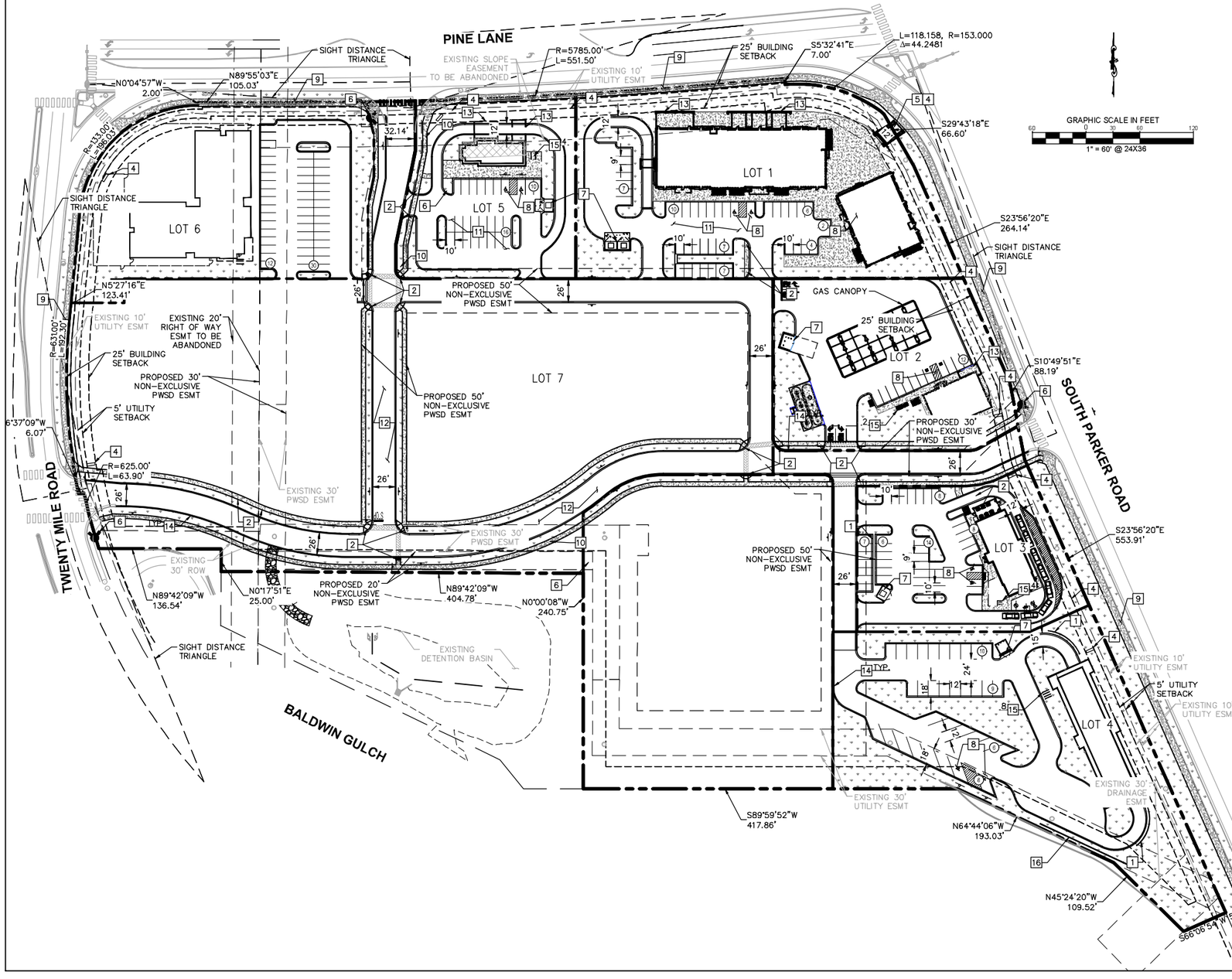
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	518	417	478	536	20	296	24	259	84	42	29
v/c Ratio	0.05	0.51	0.26	0.60	0.37	0.02	0.45	0.02	0.28	0.17	0.04	0.04
Control Delay	21.3	41.7	0.4	27.2	30.1	0.0	24.3	25.2	7.9	21.5	35.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	41.7	0.4	27.2	30.1	0.0	24.3	25.2	7.9	21.5	35.9	0.1
Queue Length 50th (ft)	7	192	0	130	151	0	154	6	53	38	13	0
Queue Length 95th (ft)	17	265	0	m124	m143	m0	225	13	91	57	28	0
Internal Link Dist (ft)		1748			385			462			469	
Turn Bay Length (ft)	275		50	175		150	200		50	225		150
Base Capacity (vph)	316	1013	1583	1010	1456	841	772	1354	1064	500	1022	658
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.51	0.26	0.47	0.37	0.02	0.38	0.02	0.24	0.17	0.04	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX G

Conceptual Site Plan



LEGEND

- PROPERTY LINE
- NUMBER OF PARKING SPACES
- ACCESSIBLE PARKING SPACES
- PROPOSED ELECTRICAL TRANSFORMER
- LANDSCAPED AREA
- HEAVY DUTY ASPHALT PAVING
- STANDARD DUTY ASPHALT PAVING
- BUILDING AREA WITHIN 40' OF SETBACK
- COLORED CONCRETE
- PROPOSED EASEMENT
- EXISTING EASEMENT
- PROPOSED CURB AND GUTTER

KEY NOTES

1. PROPOSED 3' SCREEN WALL
2. PROPOSED ACCESSIBLE RAMP W/ 36" DEEP DETECTABLE WARNING
3. PROPOSED 5' WIDE PEDESTRIAN CONNECTION.
4. PROPOSED MONUMENT SIGN.
5. PROPOSED SIDEWALK STAIRS. WIDTH PER PLAN
6. PROPOSED FIRE HYDRANT.
7. PROPOSED TRASH ENCLOSURE.
8. PROPOSED ADA PARKING STALLS.
9. PROPOSED 8' CONCRETE SIDEWALK.
10. PROPOSED 5' CONCRETE SIDEWALK.
11. PROPOSED STANDARD DUTY ASPHALT PAVING.
12. PROPOSED HEAVY DUTY ASPHALT PAVING.
13. PROPOSED BUILDING OVERHANG
14. PROPOSED 18" VERTICAL CURB.
15. PROPOSED BICYCLE PARKING.
16. PROPOSED RETAINING WALL

NOTES:
1. ALL EXISTING OR PROPOSED LIGHTING ON-SITE, EXTERIOR, UNROOFED LIGHTING SHALL CONFORM TO THE TOWN'S LIGHTING STANDARDS UNDER SECTION 13.10.140.
2. ALL MECHANICAL EQUIPMENT SHALL BE SCREENED FROM VIEW FROM A PUBLIC RIGHT OF WAY. FINAL LOCATION AND SCREENING MEASURES SHALL BE DETERMINED AT TIME OF FINAL SITE PLAN UNDER CHAPTER 13.06 OF THIS TITLE.
3. LOCATION OF TRASH RECEPTACLES SHALL BE DETERMINED AT TIME OF FINAL SITE PLAN UNDER CHAPTER 13.06 OF THIS TITLE AND BE SCREENED BY A SOLID SCREEN FENCE SURROUNDING AT LEAST 3 SIDES OF THE CONTAINER.
4. CANOPIES AND PORTICO'S THAT ARE PROPOSED AT FINAL SITE PLAN TO MEET THE ZONING REQUIREMENTS FOR SETBACK PROXIMITY MUST BE PHYSICALLY AND ARCHITECTURALLY CONNECTED TO THE PRIMARY STRUCTURE AND MUST CREATE MEANINGFUL, ATTRACTIVE AND SIGNIFICANT ARCHITECTURAL INTEREST ALONG PARKER ROAD AND/OR PINE LANE.
5. DESIGN SHOWN IS PRELIMINARY. FINAL ARCHITECTURE SHALL BE APPROVED AT THE TIME OF FINAL SITE PLAN APPROVAL.

Eisenberg Company
Full service commercial real estate
EISENBERG COMPANY
2710 E. CAMELBACK ROAD, SUITE 210
PHOENIX, AZ 85016

Adress:

LOT 1 BLOCK 3, PARKER AUTO PLAZA FILING NO. 1 COUNTY OF DOUGLASS, STATE OF COLORADO

Architect Information:
naos
Naos Design Group, LLC
4949 SOUTH SYRACUSE ST. SUITE 460
DENVER, COLORADO 80237
(p) 303.759.5777
www.naosdg.com

Kimley»Horn
4582 SOUTH ULSTER STREET
SUITE 1500
DENVER,CO 80237
PH: 303-228-2300

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PRELIMINARY SITE PLAN

Revisions:

#	Date	Description
	05/16/2018	PLANNING SUBMITTAL
	11/30/2018	TOWN REVISION
	11/14/2019	TOWN REVISION

Sheet Title:
PRELIMINARY SITE PLAN

Date: 10/07/2019
Project Number: 096502001
Drawn By: STC

Sheet Number:
03 OF 06