Traffic Impact Study

88th & Rosemary

Commerce City, Colorado

Prepared for:

Evergreen Devco, Inc.

Kimley»Horn

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

88th and Rosemary

Commerce City, Colorado

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1.0 EXECUTIVE SUMMARY

Kimley-Horn and Associates, Inc. has prepared this report to document the results of a Traffic Impact Study for the 88th and Rosemary industrial project proposed to be located on the southwest corner of the 88th Avenue and Rosemary Street intersection in Commerce City, Colorado. The 88th and Rosemary project is proposed to include a general light/medium industrial building of approximately 54,600 square feet. It is expected that 88th and Rosemary will be completed in the next few years; therefore, analysis was conducted for the 2025 short-term buildout horizon as well as the 2045 long-term twenty-year planning horizon.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The intersection of 88th Avenue and Rosemary Street (#1) was incorporated into this traffic study in accordance with City of Commerce City standards and requirements. In addition, the two proposed accesses for the project along the west side of Rosemary Street were evaluated, with the North Access (#2) providing right-in/right-out turning movements and the South Access (#3) providing full movement.

Regional access to 88th and Rosemary will be provided by Interstate 76 and State Highway 2. Primary access will be provided by 88th Avenue and Rosemary Street. Direct access will be provided by two accesses along the west side of Rosemary Street.

88th and Rosemary is expected to generate approximately 256 weekday daily trips, with 41 of these trips occurring during the morning peak hour and 26 of these trips occurring during the afternoon peak hour.

Based on the analysis presented in this report, Kimley-Horn believes the 88th and Rosemary industrial project will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following recommendations:

- With completion of the 88th and Rosemary project, two accesses are proposed along the west side of Rosemary Street. The North Access (#2) is recommended to provide right-in/right-out turning movements and is located approximately 425 feet south of 88th Avenue (measured center to center). The South Access (#3) is recommended to provide full turning movements and is proposed to be located approximately 200 feet south of the North Access (#2). It is recommended that R1-1 "STOP" signs be installed on the exiting eastbound approaches out of the development at both driveways. An R3-2 No Left Turn sign should be posted underneath the stop sign at the North Access (#2) to advise drivers that only right turning movements out of this access may be performed. A raised pork-chop island may also be considered in the driveway throat of this access to further restrict movements to right turning only.

- Per City of Commerce City standards, it is recommended that a 140-foot with 160-foot taper northbound left turn lane be constructed and designated along Rosemary Street at the South Access (#3). The through lanes along Rosemary Street will need to be redirected around this turn lane at a taper rate of 20.5 to 1 (based on W x S^2 / 60) due to the 35 mile per hour posted speed limit.

- It should be noted that the project will be responsible for the half-street improvements fronting the project along 88th Avenue and Rosemary Street which consists of providing five-lane roadway sections for the ultimate condition. However, the additional lanes will likely be striped out until surrounding development occurs and the five-lane sections can be provided throughout the entire corridor. Since the timing of the five-lane section is unknown the existing configuration was analyzed in the long-term 2045 horizon to provide a conservative analysis. If the five-lane sections are provided by 2045 this will only improve operations of what was evaluated in this study.

- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the City of Commerce City and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

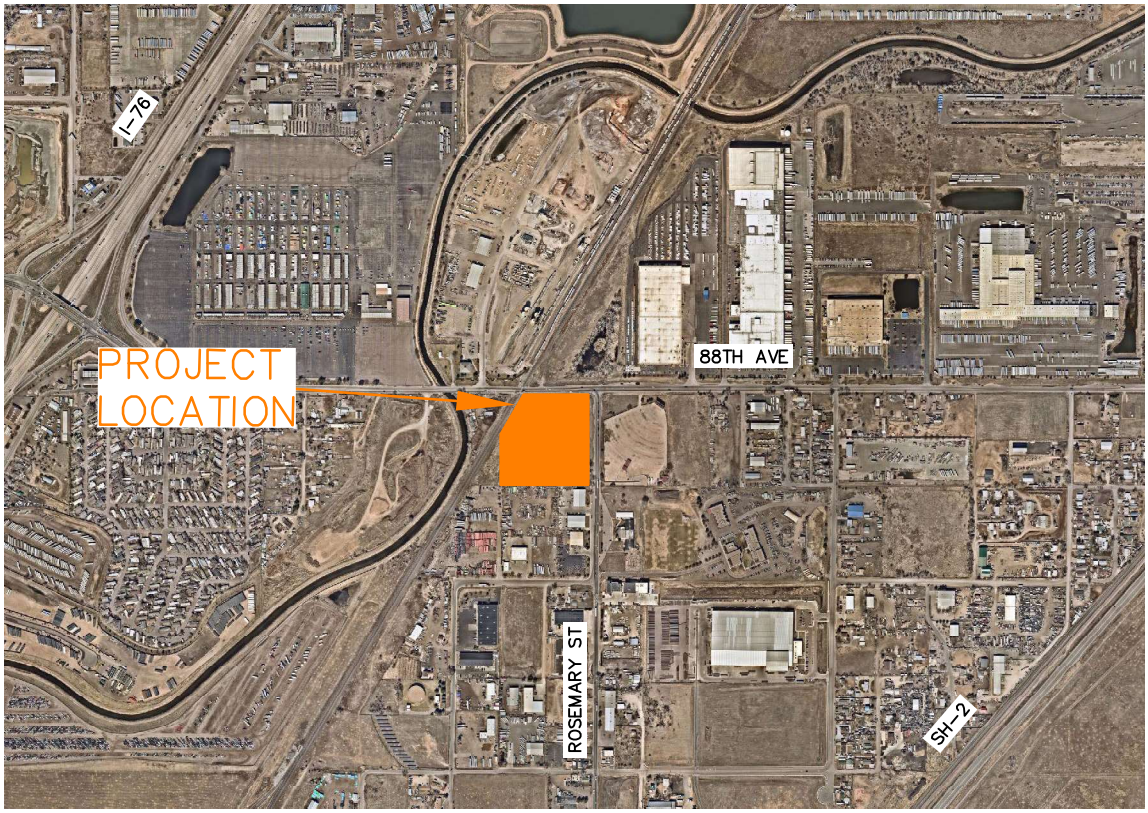
2.0 INTRODUCTION

Kimley-Horn and Associates, Inc. has prepared this report to document the results of a Traffic Impact Study for the 88th and Rosemary industrial project proposed to be located on the southwest corner of the 88th Avenue and Rosemary Street intersection in Commerce City, Colorado. A vicinity map illustrating the 88th and Rosemary development location is shown in **Figure 1**. The 88th and Rosemary project is proposed to include a general light/medium industrial building of approximately 54,600 square feet. A conceptual site plan is attached in **Appendix F**. It is expected that 88th and Rosemary will be completed in the next few years; therefore, analysis was conducted for the 2025 short-term buildout horizon as well as the 2045 long-term twenty-year planning horizon.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The intersection of 88th Avenue and Rosemary Street (#1) was incorporated into this traffic study in accordance with City of Commerce City standards and requirements. In addition, the two proposed accesses for the project along the west side of Rosemary Street were evaluated, with the North Access (#2) providing right-in/right-out turning movements and the South Access (#3) providing full movement.

Regional access to 88th and Rosemary will be provided by Interstate 76 and State Highway 2. Primary access will be provided by 88th Avenue and Rosemary Street. Direct access will be provided by two proposed accesses along the west side of Rosemary Street.

Kimley»Horn
NORTH
NTS 096266043



88TH & ROSEMARY
COMMERCE CITY, COLORADO
VICINITY MAP

FIGURE 1

Kimley»Horn

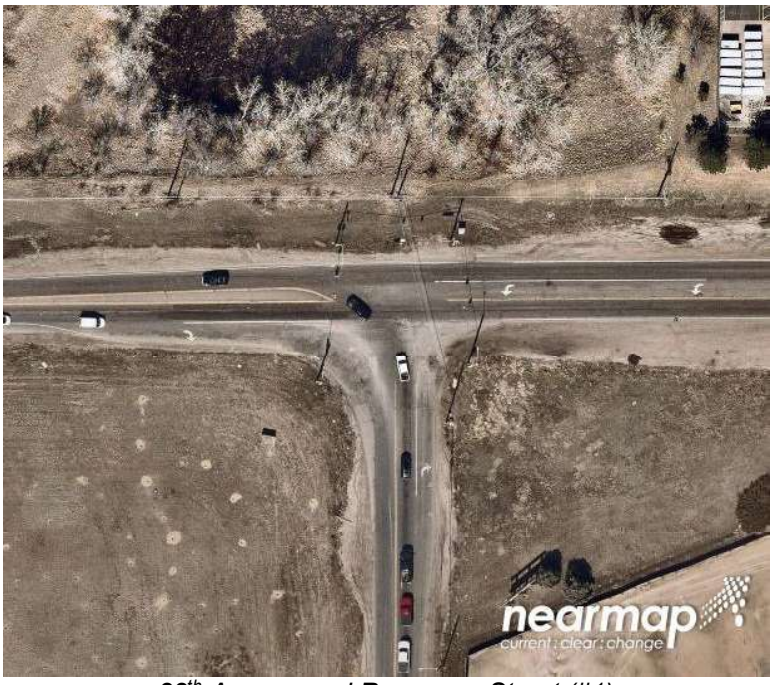
3.0 EXISTING AND FUTURE CONDITIONS

3.1 Existing Study Area

The existing site is comprised of a garage structure, shop building, and vacant land. To the north and south is industrial land. East of the project is a drive-in movie theater. To the west of the project site is a railroad track, a mobile home park, and more industrial land.

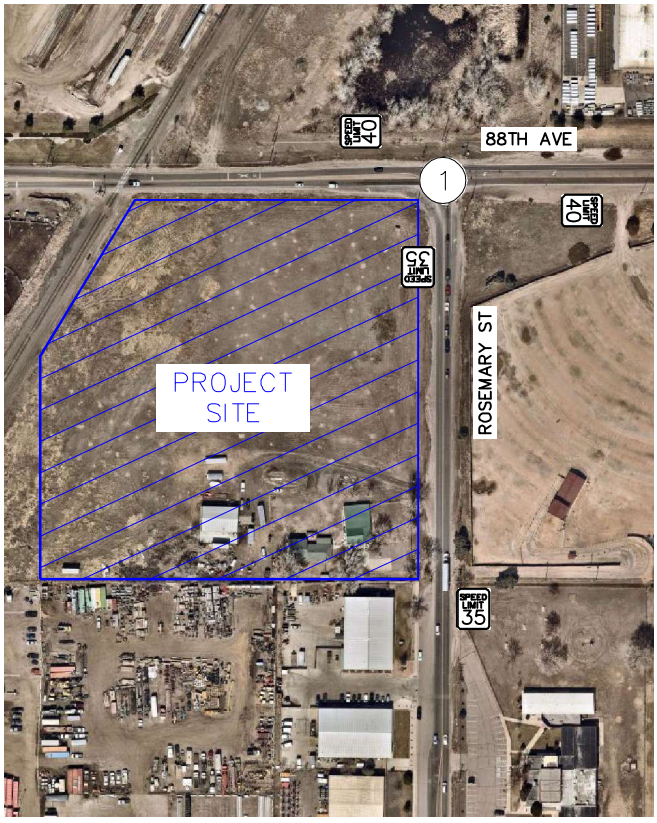
3.2 Existing Roadway Network

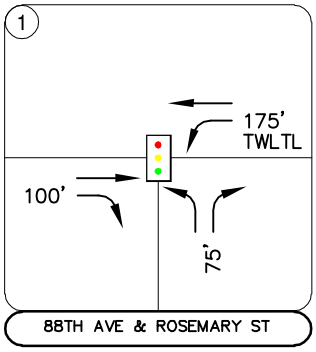
88th Avenue extends east/west with one through lane in each direction and a posted speed limit of 40 miles per hour. Rosemary Street extends northbound and southbound with one through lane in each direction and a posted speed limit of 35 miles per hour. The signalized 'T'-intersection of 88th Avenue and Rosemary Street (#1) operates with protected-permitted left turn phasing on the west leg of 88th Avenue. Eastbound right turn protected overlap phasing exists. The northbound Rosemary Street approach provides a left turn lane and a right turn lane. Of note, Rosemary Street terminates at this intersection. The eastbound 88th Avenue approach provides one through lane and a right turn lane. The westbound 88th Avenue approach provides one left turn lane and one through lane. An aerial photo of the existing intersection configuration is below (north is up).



88th Avenue and Rosemary Street (#1)

The lane configuration and control for the study area intersection is shown in **Figure 2**.





LEGEND

X Study Area Key Intersection

Signalized Intersection

Roadway Speed Limit

100' Turn Lane Length (feet)

88TH & ROSEMARY
COMMERCE CITY, COLORADO
EXISTING GEOMETRY AND CONTROL

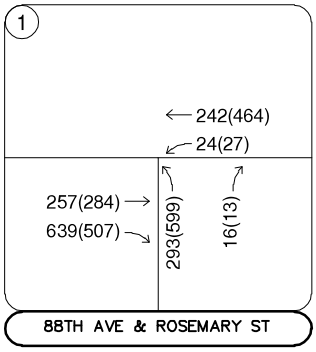
FIGURE 2

3.3 Existing Traffic Volumes

Existing turning movement counts were conducted at the study intersection on Wednesday, July 20, 2022, during the weekday morning and afternoon peak hours. The counts were conducted during the morning and afternoon peak hours of adjacent street traffic in 15-minute intervals from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. The existing intersection traffic volumes are shown in **Figure 3** with count sheets provided in **Appendix A**.

3.4 Unspecified Development Traffic Growth

According to traffic projections from the Denver Regional Council of Governments (DRCOG) traffic model, the area surrounding the site is expected to have an average 25-year growth factor of 1.50. This growth factor equates to an annual growth rate of 1.36 percent. Future traffic volume projections and growth rate calculations are provided in **Appendix B**. Therefore, a 1.36 percent annual growth rate was used to calculate future traffic volumes at the study area intersection and roadways. This annual growth rate was used to estimate short-term 2025 and long-term 2045 traffic volume projections at the key intersection and roadways. The calculated background traffic volumes for 2025 and 2045 are shown in **Figure 4** and **Figure 5,** respectively.



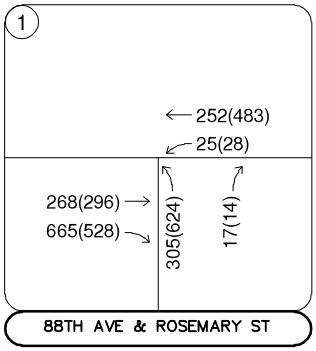
Wednesday, July 20, 2022
7:00 to 8:00AM (5:00 to 6:00PM)

LEGEND

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

88TH & ROSEMARY
COMMERCE CITY, COLORADO
2022 EXISTING TRAFFIC VOLUMES

FIGURE 3

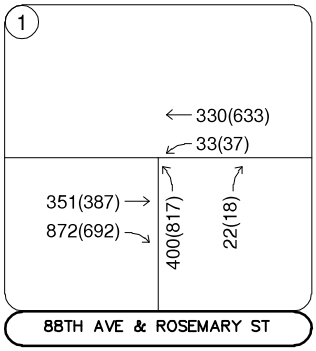


LEGEND

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

88TH & ROSEMARY
COMMERCE CITY, COLORADO
2025 BACKGROUND TRAFFIC VOLUMES

FIGURE 4



LEGEND

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

88TH & ROSEMARY
COMMERCE CITY, COLORADO
2045 BACKGROUND TRAFFIC VOLUMES

FIGURE 5

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 use 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 fitted curve equations that applies to General Light Industrial (ITE Land Use Code 110) for traffic associated with the development.

88th and Rosemary is expected to generate approximately 256 weekday daily trips, with 41 of these trips occurring during the morning peak hour and 26 of these trips occurring during the afternoon peak hour. Calculations were based on the procedure and information provided in the ITE *Trip Generation Manual, 11th Edition – Volume 1: User's Guide and Handbook*, 2021. **Table 1** summarizes the estimated trip generation for the 88th and Rosemary. The trip generation worksheets are included in **Appendix C**.

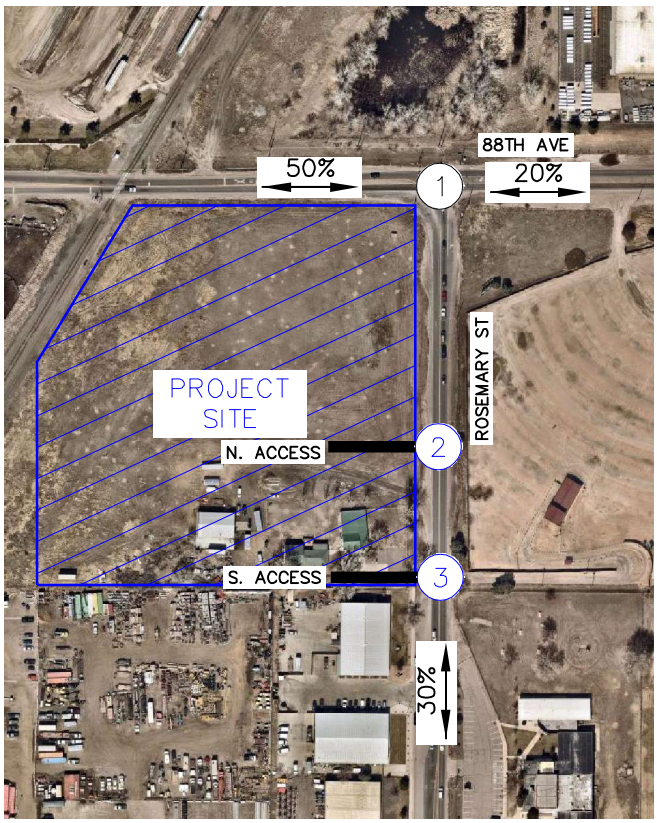
Table 1 – 88th and Rosemary Traffic Generation

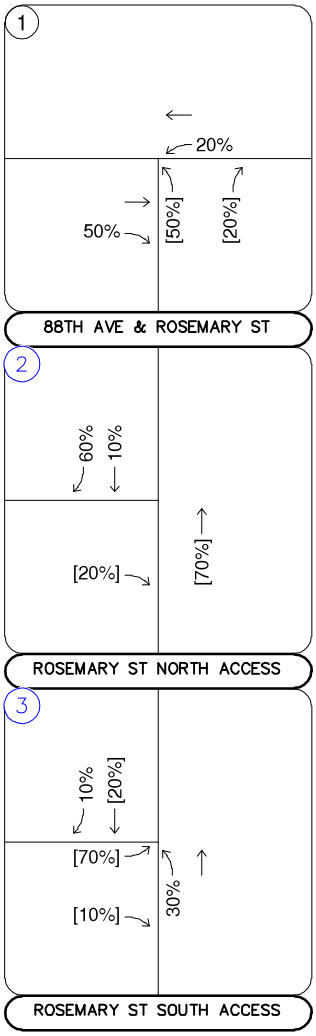
Land Use and Size	Weekday Vehicle Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
General Light Industrial (ITE 110) – 54,600 Square Feet	256	36	5	41	3	23	26

4.2 Trip Distribution

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding demographic information, and the proposed access system for the project. The 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. The project trip distribution for the proposed development is illustrated in **Figure 6**.

[1] Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition, Washington DC, 2021.





LEGEND

(X)	Study Area Key Intersection
(X)	Project Access Intersection
XX%	External Trip Distribution Percentage
XX%[XX%]	Entering[Exiting] Trip Distribution Percentage

88TH & ROSEMARY
COMMERCE CITY, COLORADO
PROJECT TRIP DISTRIBUTION

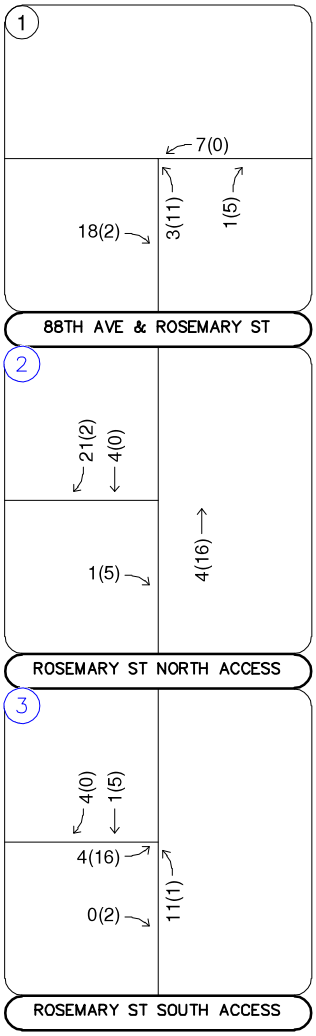
FIGURE 6

4.3 Traffic Assignment

88th and Rosemary traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. Traffic assignment is shown in **Figure 7.**

4.4 Total (Background Plus Project) Traffic

Site traffic volumes were added to the background volumes to represent estimated traffic conditions for the short-term 2025 buildout horizon and long-term 2045 twenty-year planning horizon. These total background plus project traffic volumes for the study area are illustrated for the 2025 and 2045 horizon years in **Figures 8** and **9**, respectively.

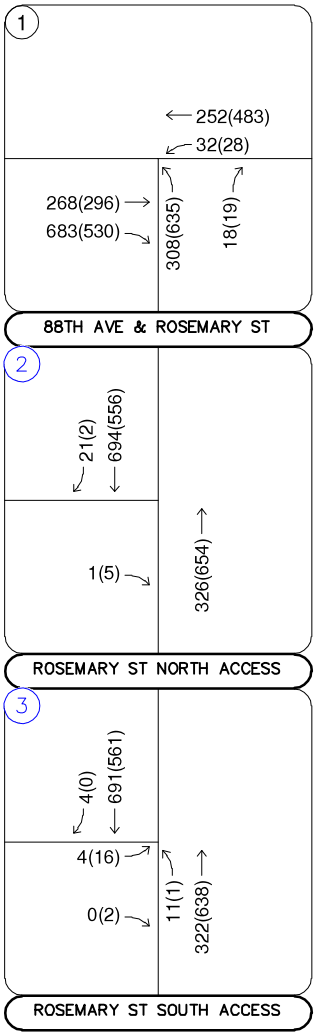


LEGEND

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

88TH & ROSEMARY
COMMERCE CITY, COLORADO
PROJECT TRAFFIC ASSIGNMENT

FIGURE 7

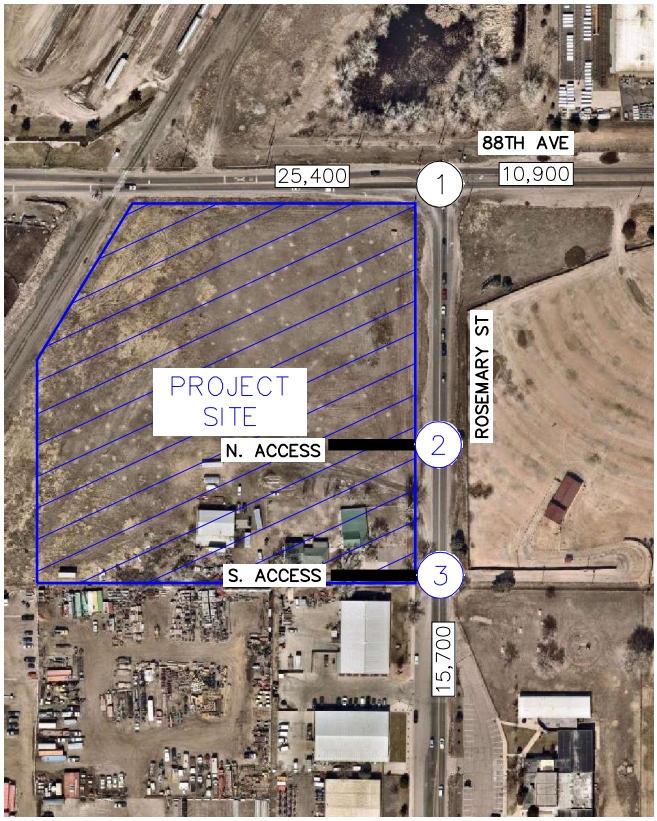


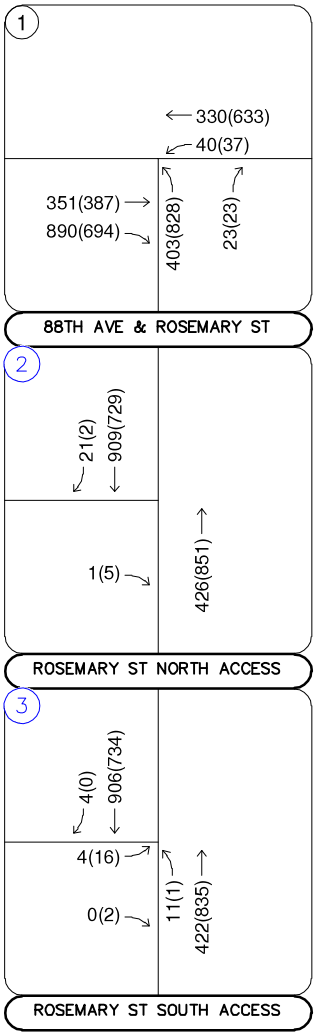
LEGEND

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

88TH & ROSEMARY
COMMERCE CITY, COLORADO
2025 TOTAL TRAFFIC VOLUMES

FIGURE 8





LEGEND

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

88TH & ROSEMARY
COMMERCE CITY, COLORADO
2045 TOTAL TRAFFIC VOLUMES

FIGURE 9

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 2025 and 2045 development horizons at the identified key intersections. 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 practice recommends overall intersection LOS D and movement/approach LOS E as the minimum desirable 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, Sixth Edition, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the 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, roundabout, and all-way stop controlled intersections are defined for each approach and for the overall intersection.

[2] Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.

5.2 Key Intersection Operational Analysis

Calculations for the operational level of service at the key intersections for the study area are provided in **Appendix D**. The existing year analysis is based on the lane geometry and intersection control shown in **Figure 2.** Existing peak hour factors were utilized in the existing, 2025, and 2045 horizon analysis years. Based on increased national attention given to establishing appropriate yellow and all-red clearance intervals to improve intersection safety, these have been calculated and are applied for approaches at the signalized intersections. The increase in yellow and all-red time sacrifices intersection capacity for improved safety. Synchro traffic analysis software was used to analyze the signalized, and unsignalized key intersections for HCM level of service.

88th Avenue & Rosemary Street (#1)

The signalized intersection of 88th Avenue and Rosemary Street (#1) operates with protected-permitted left turn phasing on the west leg of 88th Avenue. The eastbound right turn operates with protected overlap phasing. The intersection operates acceptably at LOS B during both peak hours under existing conditions. With project traffic, this intersection is anticipated to continue operating acceptably at LOS B during both peak hours in 2025, and at LOS B during the morning peak hour and LOS C during the afternoon peak hour in the 2045 horizon. Of note, this intersection is anticipated to be reconstructed to move the signal poles to their ultimate location. However, since this intersection operates acceptably with the current configuration it is believed the geometry will remain the same with the signal modification improvements. It should be noted that the project will be responsible for the half-street improvements fronting the project along 88th Avenue and Rosemary Street which consists of providing five-lane roadway sections for the ultimate condition. However, the additional lanes will likely be striped out until surrounding development occurs and the five-lane sections can be provided throughout the entire corridor. Since the timing of the five-lane section is unknown the existing configuration was analyzed in the long-term 2045 horizon to provide a conservative analysis. If the five-lane sections are provided by 2045 this will only improve operations of what was evaluated in this study. **Table 3** provides the results of the LOS analysis conducted at this intersection.

Table 3 – 88th Avenue & Rosemary Street LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2022 Existing	10.3	B	16.6	B
2025 Background	10.5	B	17.1	B
2025 Background Plus Project	10.5	B	17.3	B
2045 Background	11.9	B	24.1	C
2045 Background Plus Project	12.0	B	25.0	C

Project Accesses

With completion of the 88th and Rosemary project, two accesses are proposed along the west side of Rosemary Street. The North Access (#2) is recommended to be restricted to right-in/right-out turning movements while the South Access (#3) should provide full turning movements. It is recommended that R1-1 “STOP” signs be installed on the exiting eastbound approaches out of the development at both driveways. An R3-2 No Left Turn sign should be installed underneath the STOP sign at the North Access (#2) to advise drivers that only right turning movements may be made out of this access.. A raised pork chop island may need to be considered in the driveway throat of this access to fully restrict turning movements in and out of this access to right turns only. Additionally, to meet City of Commerce City standards, it is recommended that a northbound left turn lane be constructed and designated at the South Access (#3). Vehicles exiting the development from the South Access (#3) are anticipated to **Table 4** provides the results of the level of service for this project street access. As shown in the table, the project street access intersections along Rosemary Street are anticipated to have all movements operating with acceptable LOS C or better during the peak hours in both the buildout year 2025 and the 2045 long term horizons.

Table 4 – Project Access Level of Service Results

Intersection	2025 Total				2045 Total			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS
Rosemary St N. Access (#2)								
Eastbound Right	14.0	B	12.3	B	17.2	C	14.4	B
Rosemary St S. Access (#3)								
Northbound Left	9.3	A	8.7	A	10.2	B	9.4	A
Eastbound Approach	15.5	C	16.6	C	18.9	C	20.8	C

5.3 Vehicle Queuing Analysis

Queuing analysis was conducted for the study area intersections per Commerce City standards and requirements. Results were obtained from the 95th percentile queue lengths obtained from the Synchro analysis. Queue analysis worksheets at the signalized intersections are provided in **Appendix E**. Queue length calculations for unsignalized intersections are provided within the level of service operational sheets provided in **Appendix D**. Results of the queuing analysis and recommendations at the study area intersections are provided in **Table 5.** Of note, any queue lengths calculated at less than one vehicle were rounded up to 25 feet to account for one vehicle of storage needed.

Table 5 – Turn Lane Queuing Analysis Results

Intersection Turn Lane	Existing Turn Lane Length (feet)	2025 Calculated Queue (feet)	2025 Recommended Length (feet)	2045 Calculated Queue (feet)	2045 Recommended Length (feet)
88th Ave & Rosemary St (#1)					
Eastbound Right	100’	12’	100’	18’	100’
Westbound Left	175’ TWLTL	34’	175’ TWLTL	35’	175’ TWLTL
Northbound Right	75’	18’	75’	42’	75’
Rosemary St S. Access (#3)					
Northbound Left	DNE	25’	**140’+160’T (CC)**	25’	140’+160’T (CC)

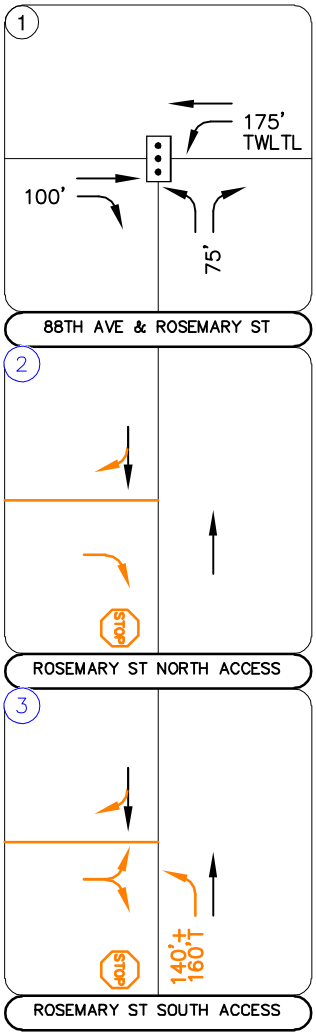
DNE = Does Not Exist; TWLTL = Two-Way Left Turn Lane; **Blue** Text = Recommendation;
CC = City of Commerce City Standards

All queues are anticipated to remain within the existing or recommended turn lane lengths through the 2045 horizon.

To meet City of Commerce City standards, it is recommended that a 140-foot with 160-foot taper northbound left turn lane be constructed and designated along Rosemary Street at the South Access (#3). The through lanes along Rosemary Street will need to be redirected around this turn lane at a taper rate of 20.5 to 1 (based on W x S^2 / 60) due to the 35 mile per hour posted speed limit.

5.4 Improvement Summary

Based on the results of the intersection operational and vehicle queuing analysis, the key intersection recommended improvements and control are shown in **Figure 10**.



LEGEND

- X — Study Area Key Intersection
- X — Project Access Intersection
- Signalized Intersection
- STOP — Stop Controlled Approach
- Improvement
- 100' — Turn Lane Length (feet)

88TH & ROSEMARY
COMMERCE CITY, COLORADO
RECOMMENDED GEOMETRY
AND CONTROL

FIGURE 10

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, Kimley-Horn believes the 88th and Rosemary industrial project will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following recommendations:

- With completion of the 88th and Rosemary project, two accesses are proposed along the west side of Rosemary Street. The North Access (#2) is recommended to provide right-in/right-out turning movements and is located approximately 425 feet south of 88th Avenue (measured center to center). The South Access (#3) is recommended to provide full turning movements and is proposed to be located approximately 200 feet south of the North Access (#2). It is recommended that R1-1 "STOP" signs be installed on the exiting eastbound approaches out of the development at both driveways. An R3-2 No Left Turn sign should be posted underneath the stop sign at the North Access (#2) to advise drivers that only right turning movements out of this access may be performed. An R6-1R "ONE WAY" sign may also be installed on the east side of Rosemary Street directly to the east of the North Access (#2) to further discourage vehicles from making left turning movements out of this access. A raised pork-chop island may also be considered in the driveway throat of this access to further restrict movements to right turning only.

- Per City of Commerce City standards, it is recommended that a 140-foot with 160-foot taper northbound left turn lane be constructed and designated along Rosemary Street at the South Access (#3). The through lanes along Rosemary Street will need to be redirected around this turn lane at a taper rate of 20.5 to 1 (based on W x S^2 / 60) due to the 35 mile per hour posted speed limit.

- It should be noted that the project will be responsible for the half-street improvements fronting the project along 88th Avenue and Rosemary Street which consists of providing five-lane roadway sections for the ultimate condition. However, the additional lanes will likely be striped out until surrounding development occurs and the five-lane sections can be provided throughout the entire corridor. Since the timing of the five-lane section is unknown the existing configuration was analyzed in the long-term 2045 horizon to provide a conservative analysis.

If the five-lane sections are provided by 2045 this will only improve operations of what was evaluated in this study.

- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the City of Commerce City and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

APPENDICES

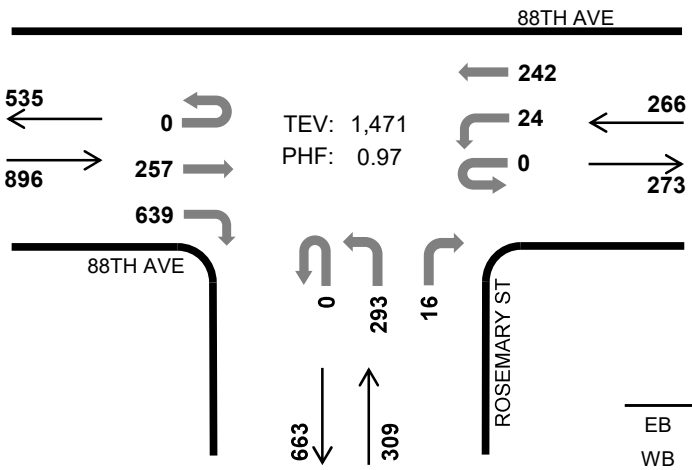
APPENDIX A

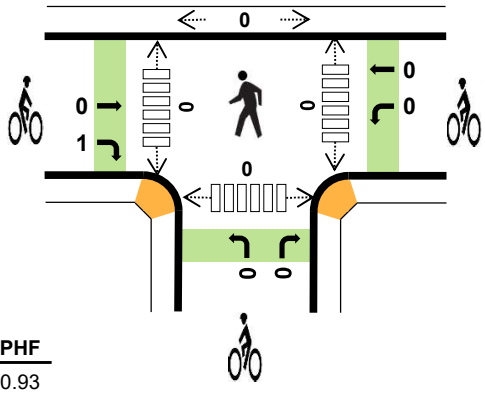
Intersection Count Sheets

ROSEMARY ST
88TH AVE

Peak Hour

Date: 07/20/2022
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:00 AM to 8:00 AM





	HV %:	PHF
EB	5.7%	0.93
WB	22.6%	0.84
NB	13.9%	0.86
SB	-	-
TOTAL	10.5%	0.97

Two-Hour Count Summaries

Interval Start		88TH AVE Eastbound				88TH AVE Westbound				ROSEMARY ST Northbound				n/a Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		**0**	**0**	**82**	**158**	**0**	**10**	**52**	**0**	**0**	**72**	**0**	**4**	**0**	**0**	**0**	**0**	**378**	0
7:15 AM		**0**	**0**	**46**	**169**	**0**	**4**	**51**	**0**	**0**	**73**	**0**	**2**	**0**	**0**	**0**	**0**	**345**	0
7:30 AM		**0**	**0**	**54**	**153**	**0**	**7**	**63**	**0**	**0**	**82**	**0**	**8**	**0**	**0**	**0**	**0**	**367**	0
7:45 AM		**0**	**0**	**75**	**159**	**0**	**3**	**76**	**0**	**0**	**66**	**0**	**2**	**0**	**0**	**0**	**0**	**381**	**1,471**
8:00 AM		0	0	67	120	0	19	50	0	0	53	0	9	0	0	0	0	318	1,411
8:15 AM		0	0	46	117	0	4	49	0	0	77	0	8	0	0	0	0	301	1,367
8:30 AM		0	0	59	120	0	7	54	0	0	59	0	4	0	0	0	0	303	1,303
8:45 AM		0	0	40	81	0	7	60	0	0	59	0	5	0	0	0	0	252	1,174
Count Total		0	0	469	1,077	0	61	455	0	0	541	0	42	0	0	0	0	2,645	0
Peak Hour	**All**	**0**	**0**	**257**	**639**	**0**	**24**	**242**	**0**	**0**	**293**	**0**	**16**	**0**	**0**	**0**	**0**	**1,471**	**0**
	HV	**0**	**0**	**27**	**24**	**0**	**2**	**58**	**0**	**0**	**39**	**0**	**4**	**0**	**0**	**0**	**0**	**154**	**0**
	HV%	**-**	**-**	**11%**	**4%**	**-**	**8%**	**24%**	**-**	**-**	**13%**	**-**	**25%**	**-**	**-**	**-**	**-**	**10%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	**19**	**12**	**13**	**0**	***44***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
7:15 AM	**9**	**12**	**7**	**0**	***28***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**10**	**15**	**16**	**0**	***41***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**13**	**21**	**7**	**0**	***41***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	20	15	5	0	*40*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	17	17	11	0	*45*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	26	20	8	0	*54*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	20	24	3	0	*47*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	134	136	70	0	*340*	1	0	0	0	*1*	0	0	0	0	*0*
Peak Hr	**51**	**60**	**43**	**0**	***154***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	88TH AVE				88TH AVE				ROSEMARY ST				n/a				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	**0**	**0**	**9**	**10**	**0**	**0**	**12**	**0**	**0**	**11**	**0**	**2**	**0**	**0**	**0**	**0**	**44**	0
7:15 AM	**0**	**0**	**4**	**5**	**0**	**1**	**11**	**0**	**0**	**6**	**0**	**1**	**0**	**0**	**0**	**0**	**28**	0
7:30 AM	**0**	**0**	**7**	**3**	**0**	**1**	**14**	**0**	**0**	**15**	**0**	**1**	**0**	**0**	**0**	**0**	**41**	0
7:45 AM	**0**	**0**	**7**	**6**	**0**	**0**	**21**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**41**	**154**
8:00 AM	0	0	12	8	0	3	12	0	0	5	0	0	0	0	0	0	40	150
8:15 AM	0	0	12	5	0	2	15	0	0	8	0	3	0	0	0	0	45	167
8:30 AM	0	0	15	11	0	4	16	0	0	6	0	2	0	0	0	0	54	180
8:45 AM	0	0	16	4	0	3	21	0	0	2	0	1	0	0	0	0	47	186
Count Total	0	0	82	52	0	14	122	0	0	60	0	10	0	0	0	0	340	0
Peak Hour	**0**	**0**	**27**	**24**	**0**	**2**	**58**	**0**	**0**	**39**	**0**	**4**	**0**	**0**	**0**	**0**	**154**	**0**

Two-Hour Count Summaries - Bikes

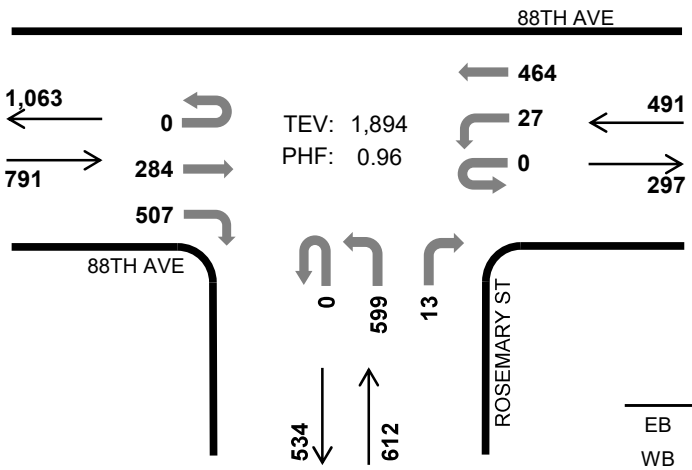
Interval Start	88TH AVE			88TH AVE			ROSEMARY ST			n/a			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

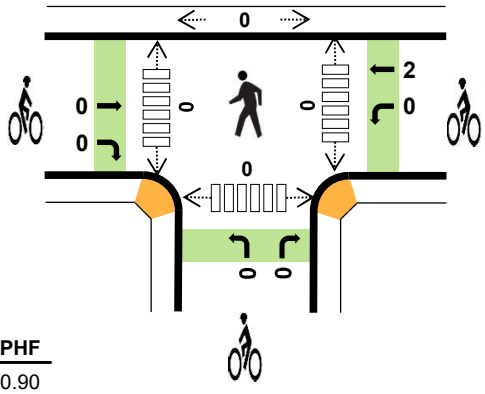
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

ROSEMARY ST
88TH AVE

Peak Hour

Date: 07/20/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	7.0%	0.90
WB	5.5%	0.96
NB	2.9%	0.97
SB	-	-
TOTAL	5.3%	0.96

Two-Hour Count Summaries

Interval Start		88TH AVE Eastbound				88TH AVE Westbound				ROSEMARY ST Northbound				n/a Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	72	102	0	12	97	0	0	159	0	3	0	0	0	0	445	0
4:15 PM		0	0	66	112	0	3	90	0	0	137	0	7	0	0	0	0	415	0
4:30 PM		0	0	72	114	0	8	133	0	0	148	0	9	0	0	0	0	484	0
4:45 PM		0	0	67	124	0	7	89	0	0	127	0	8	0	0	0	0	422	1,766
5:00 PM		**0**	**0**	**59**	**105**	**0**	**10**	**115**	**0**	**0**	**150**	**0**	**2**	**0**	**0**	**0**	**0**	**441**	1,762
5:15 PM		**0**	**0**	**78**	**141**	**0**	**4**	**111**	**0**	**0**	**150**	**0**	**7**	**0**	**0**	**0**	**0**	**491**	1,838
5:30 PM		**0**	**0**	**80**	**137**	**0**	**8**	**115**	**0**	**0**	**148**	**0**	**3**	**0**	**0**	**0**	**0**	**491**	1,845
5:45 PM		**0**	**0**	**67**	**124**	**0**	**5**	**123**	**0**	**0**	**151**	**0**	**1**	**0**	**0**	**0**	**0**	**471**	**1,894**
Count Total		0	0	561	959	0	57	873	0	0	1,170	0	40	0	0	0	0	3,660	0
Peak Hour	**All**	**0**	**0**	**284**	**507**	**0**	**27**	**464**	**0**	**0**	**599**	**0**	**13**	**0**	**0**	**0**	**0**	**1,894**	**0**
	HV	**0**	**0**	**34**	**21**	**0**	**2**	**25**	**0**	**0**	**16**	**0**	**2**	**0**	**0**	**0**	**0**	**100**	**0**
	HV%	**-**	**-**	**12%**	**4%**	**-**	**7%**	**5%**	**-**	**-**	**3%**	**-**	**15%**	**-**	**-**	**-**	**-**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	18	2	8	0	*28*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	17	8	5	0	*30*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	18	10	6	0	*34*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	22	5	4	0	*31*	0	0	0	0	*0*	0	0	0	0	*0*
5:00 PM	**10**	**7**	**3**	**0**	***20***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**14**	**9**	**8**	**0**	***31***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
5:30 PM	**19**	**6**	**4**	**0**	***29***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:45 PM	**12**	**5**	**3**	**0**	***20***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***
Count Total	130	52	41	0	*223*	0	2	0	0	*2*	0	0	0	0	*0*
Peak Hr	**55**	**27**	**18**	**0**	***100***	**0**	**2**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	88TH AVE				88TH AVE				ROSEMARY ST				n/a				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	11	7	0	1	1	0	0	7	0	1	0	0	0	0	28	0
4:15 PM	0	0	14	3	0	0	8	0	0	3	0	2	0	0	0	0	30	0
4:30 PM	0	0	9	9	0	2	8	0	0	5	0	1	0	0	0	0	34	0
4:45 PM	0	0	17	5	0	1	4	0	0	2	0	2	0	0	0	0	31	123
5:00 PM	**0**	**0**	**7**	**3**	**0**	**1**	**6**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**20**	115
5:15 PM	**0**	**0**	**8**	**6**	**0**	**1**	**8**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**31**	116
5:30 PM	**0**	**0**	**13**	**6**	**0**	**0**	**6**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**29**	111
5:45 PM	**0**	**0**	**6**	**6**	**0**	**0**	**5**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**100**
Count Total	0	0	85	45	0	6	46	0	0	33	0	8	0	0	0	0	223	0
Peak Hour	**0**	**0**	**34**	**21**	**0**	**2**	**25**	**0**	**0**	**16**	**0**	**2**	**0**	**0**	**0**	**0**	**100**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	88TH AVE			88TH AVE			ROSEMARY ST			n/a			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	1
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:45 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**
Count Total	0	0	0	0	2	0	0	0	0	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

APPENDIX B

Future Traffic Projections

DRCOG Traffic Projections: 88th & Rosemary

Location	2020	2050	Growth Factor	Annual Growth
88th Ave W/O Rosemary St	20,000	30,000	1.50	1.36%
88th Ave E/O Rosemary St	14,000	21,000	1.50	1.36%
Rosemary St S/O 88th Ave	6,000	9,000	1.50	1.36%
Total	40,000	60,000	1.50	**1.36%**

APPENDIX C

Trip Generation Worksheets

Kimley»Horn

Project	88th & Rosemary				
Subject	Trip Generation for General Light Industrial				
Designed by	TES	*Date*	August 02, 2022	*Job No.*	096266043
Checked by		*Date*		*Sheet No.*	of

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Fitted Curve Equations

Land Use Code - General Light Industrial (110)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)
Gross Floor Area = 54,600
X = 54.6
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 32)

Average Weekday
T = 0.68(X) + 3.81
T = 0.68 * 55 + 3.81

Directional Distribution: 88% ent. 12% exit.
T = 41 Average Vehicle Trip Ends
36 entering 5 exiting

36 + 5 = 41
(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 33)

Average Weekday
Ln(T) = 0.72 Ln(X) + 0.38
Ln(T) = 0.72 * Ln(55) + 0.38

Directional Distribution: 14% ent. 86% exit.
T = 26 Average Vehicle Trip Ends
3 entering 22 exiting

3 + 23 = 26

Weekday (100 Series Page 31)

Daily Weekday
T = 3.76 (X) + 50.47
(T) = 3.76 * 54.6 + 50.47

Directional Distribution: 50% entering, 50% exiting
T = 256 Average Vehicle Trip Ends
128 entering 128 exiting

128 + 128 = 256

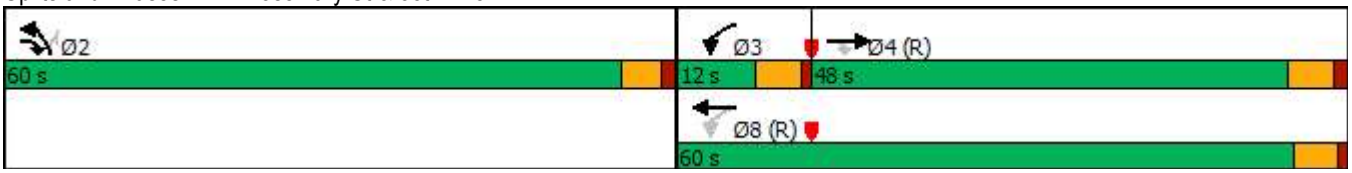
APPENDIX D

Intersection Analysis Worksheets

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	257	639	24	242	293	16
Future Volume (vph)	257	639	24	242	293	16
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	48.0	60.0	12.0	60.0	60.0	60.0
Total Split (%)	40.0%	50.0%	10.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	47.4	109.9	55.0	55.0	55.0	55.0
Actuated g/C Ratio	0.40	0.92	0.46	0.46	0.46	0.46
v/c Ratio	0.37	0.45	0.07	0.35	0.42	0.02
Control Delay	29.1	1.1	18.5	22.8	24.0	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	1.1	18.5	22.8	24.0	10.2
LOS	C	A	B	C	C	B
Approach Delay	9.2			22.4	23.3	
Approach LOS	A			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 52.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	257	639	24	242	293	16
Future Volume (veh/h)	257	639	24	242	293	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1559	1559	1693	1693
Adj Flow Rate, veh/h	265	659	25	249	302	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	6	23	23	14	14
Cap, veh/h	961	1518	319	929	739	657
Arrive On Green	0.53	0.53	0.02	0.60	0.46	0.46
Sat Flow, veh/h	1811	1535	1485	1559	1612	1434
Grp Volume(v), veh/h	265	659	25	249	302	16
Grp Sat Flow(s),veh/h/ln	1811	1535	1485	1559	1612	1434
Q Serve(g_s), s	9.7	1.0	0.9	9.2	15.0	0.7
Cycle Q Clear(g_c), s	9.7	1.0	0.9	9.2	15.0	0.7
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	961	1518	319	929	739	657
V/C Ratio(X)	0.28	0.43	0.08	0.27	0.41	0.02
Avail Cap(c_a), veh/h	961	1518	371	929	739	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	0.0	11.9	11.7	21.7	17.8
Incr Delay (d2), s/veh	0.7	0.9	0.1	0.7	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	15.1	0.3	3.3	6.0	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.2	0.9	12.0	12.4	23.3	17.9
LnGrp LOS	B	A	B	B	C	B
Approach Vol, veh/h	924			274	318	
Approach Delay, s/veh	5.3			12.3	23.1	
Approach LOS	A			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	60.0	7.8	69.7	77.5
Change Period (Y+Rc), s	5.0	5.0	5.5	* 5.5
Max Green Setting (Gmax), s	55.0	7.0	42.5	* 55
Max Q Clear Time (g_c+I1), s	17.0	2.9	11.7	11.2
Green Ext Time (p_c), s	1.0	0.0	4.7	1.6

Intersection Summary	
HCM 6th Ctrl Delay	10.3
HCM 6th LOS	B

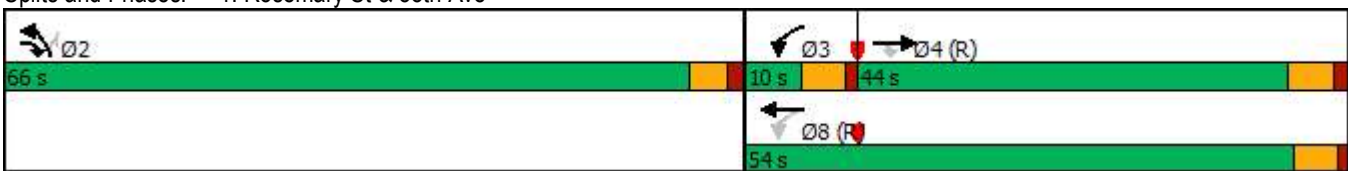
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	284	507	27	464	599	13
Future Volume (vph)	284	507	27	464	599	13
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	44.0	66.0	10.0	54.0	66.0	66.0
Total Split (%)	36.7%	55.0%	8.3%	45.0%	55.0%	55.0%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	42.5	111.0	49.0	49.0	61.0	61.0
Actuated g/C Ratio	0.35	0.92	0.41	0.41	0.51	0.51
v/c Ratio	0.47	0.37	0.09	0.66	0.70	0.02
Control Delay	34.3	0.8	22.1	34.1	27.8	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	0.8	22.1	34.1	27.8	11.5
LOS	C	A	C	C	C	B
Approach Delay	12.8			33.4	27.5	
Approach LOS	B			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 22.9	Intersection LOS: C
Intersection Capacity Utilization 65.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	284	507	27	464	599	13
Future Volume (veh/h)	284	507	27	464	599	13
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1811	1811	1856	1856
Adj Flow Rate, veh/h	296	528	28	483	624	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	6	6	3	3
Cap, veh/h	860	1503	342	989	898	799
Arrive On Green	0.48	0.48	0.03	0.55	0.51	0.51
Sat Flow, veh/h	1796	1522	1725	1811	1767	1572
Grp Volume(v), veh/h	296	528	28	483	624	14
Grp Sat Flow(s),veh/h/ln	1796	1522	1725	1811	1767	1572
Q Serve(g_s), s	12.3	0.8	0.9	19.8	32.2	0.5
Cycle Q Clear(g_c), s	12.3	0.8	0.9	19.8	32.2	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	860	1503	342	989	898	799
V/C Ratio(X)	0.34	0.35	0.08	0.49	0.69	0.02
Avail Cap(c_a), veh/h	860	1503	370	989	898	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	0.0	15.0	16.9	22.4	14.6
Incr Delay (d2), s/veh	1.1	0.6	0.1	1.7	4.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	12.0	0.4	8.5	14.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.6	0.7	15.1	18.6	26.8	14.7
LnGrp LOS	C	A	B	B	C	B
Approach Vol, veh/h	824			511	638	
Approach Delay, s/veh	7.8			18.4	26.6	
Approach LOS	A			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	66.0	8.0	63.5	71.5
Change Period (Y+Rc), s	5.0	5.0	5.5	* 5.5
Max Green Setting (Gmax), s	61.0	5.0	38.5	* 49
Max Q Clear Time (g_c+I1), s	34.2	2.9	14.3	21.8
Green Ext Time (p_c), s	2.3	0.0	4.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

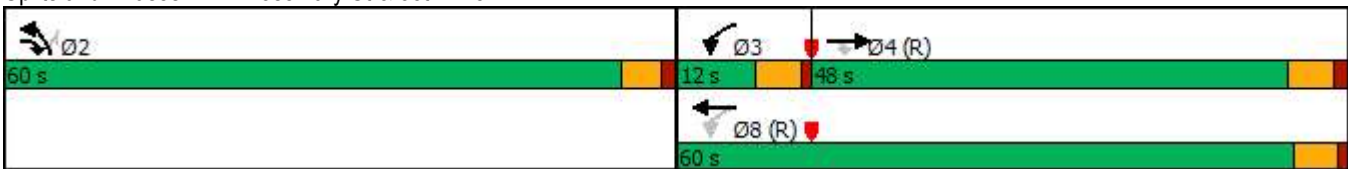
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	268	665	25	252	305	17
Future Volume (vph)	268	665	25	252	305	17
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	48.0	60.0	12.0	60.0	60.0	60.0
Total Split (%)	40.0%	50.0%	10.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	47.4	109.9	55.0	55.0	55.0	55.0
Actuated g/C Ratio	0.40	0.92	0.46	0.46	0.46	0.46
v/c Ratio	0.39	0.47	0.07	0.37	0.43	0.03
Control Delay	29.4	1.2	18.6	23.1	24.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	1.2	18.6	23.1	24.3	10.1
LOS	C	A	B	C	C	B
Approach Delay	9.3			22.7	23.6	
Approach LOS	A			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 53.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	268	665	25	252	305	17
Future Volume (veh/h)	268	665	25	252	305	17
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1559	1559	1693	1693
Adj Flow Rate, veh/h	276	686	26	260	314	18
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	6	23	23	14	14
Cap, veh/h	960	1517	310	929	739	657
Arrive On Green	0.53	0.53	0.02	0.60	0.46	0.46
Sat Flow, veh/h	1811	1535	1485	1559	1612	1434
Grp Volume(v), veh/h	276	686	26	260	314	18
Grp Sat Flow(s),veh/h/ln	1811	1535	1485	1559	1612	1434
Q Serve(g_s), s	10.1	1.1	0.9	9.7	15.7	0.8
Cycle Q Clear(g_c), s	10.1	1.1	0.9	9.7	15.7	0.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	960	1517	310	929	739	657
V/C Ratio(X)	0.29	0.45	0.08	0.28	0.43	0.03
Avail Cap(c_a), veh/h	960	1517	361	929	739	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	12.0	11.8	21.9	17.8
Incr Delay (d2), s/veh	0.8	1.0	0.1	0.8	1.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	16.2	0.3	3.5	6.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.4	1.0	12.1	12.5	23.7	17.9
LnGrp LOS	B	A	B	B	C	B
Approach Vol, veh/h	962			286	332	
Approach Delay, s/veh	5.4			12.5	23.3	
Approach LOS	A			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	60.0	7.9	69.6	77.5
Change Period (Y+Rc), s	5.0	5.0	5.5	* 5.5
Max Green Setting (Gmax), s	55.0	7.0	42.5	* 55
Max Q Clear Time (g_c+I1), s	17.7	2.9	12.1	11.7
Green Ext Time (p_c), s	1.1	0.0	5.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

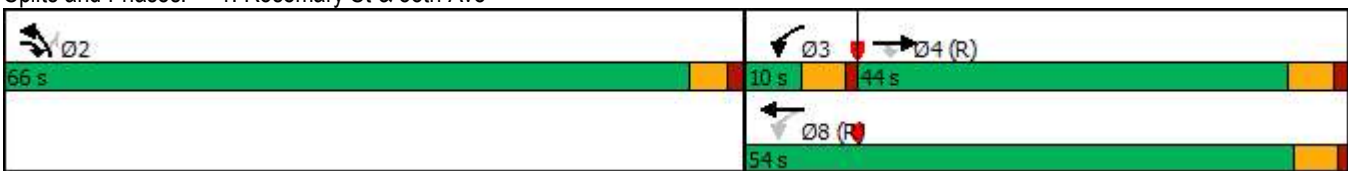
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	296	528	28	483	624	14
Future Volume (vph)	296	528	28	483	624	14
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	44.0	66.0	10.0	54.0	66.0	66.0
Total Split (%)	36.7%	55.0%	8.3%	45.0%	55.0%	55.0%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	42.5	111.0	49.0	49.0	61.0	61.0
Actuated g/C Ratio	0.35	0.92	0.41	0.41	0.51	0.51
v/c Ratio	0.49	0.38	0.09	0.69	0.73	0.02
Control Delay	34.7	0.9	22.2	35.1	29.1	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	0.9	22.2	35.1	29.1	11.1
LOS	C	A	C	D	C	B
Approach Delay	13.0			34.4	28.7	
Approach LOS	B			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 68.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	296	528	28	483	624	14
Future Volume (veh/h)	296	528	28	483	624	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1811	1811	1856	1856
Adj Flow Rate, veh/h	308	550	29	503	650	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	6	6	3	3
Cap, veh/h	859	1502	332	989	898	799
Arrive On Green	0.48	0.48	0.03	0.55	0.51	0.51
Sat Flow, veh/h	1796	1522	1725	1811	1767	1572
Grp Volume(v), veh/h	308	550	29	503	650	15
Grp Sat Flow(s),veh/h/ln	1796	1522	1725	1811	1767	1572
Q Serve(g_s), s	13.0	0.9	1.0	21.0	34.3	0.6
Cycle Q Clear(g_c), s	13.0	0.9	1.0	21.0	34.3	0.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	859	1502	332	989	898	799
V/C Ratio(X)	0.36	0.37	0.09	0.51	0.72	0.02
Avail Cap(c_a), veh/h	859	1502	359	989	898	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	15.1	17.1	22.9	14.6
Incr Delay (d2), s/veh	1.2	0.7	0.1	1.9	5.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	12.8	0.4	9.0	15.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.9	0.7	15.2	19.0	28.0	14.7
LnGrp LOS	C	A	B	B	C	B
Approach Vol, veh/h	858			532	665	
Approach Delay, s/veh	7.9			18.8	27.7	
Approach LOS	A			B	C	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		66.0	8.1	63.4		71.5
Change Period (Y+Rc), s		5.0	5.0	5.5		* 5.5
Max Green Setting (Gmax), s		61.0	5.0	38.5		* 49
Max Q Clear Time (g_c+I1), s		36.3	3.0	15.0		23.0
Green Ext Time (p_c), s		2.4	0.0	4.2		3.5

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

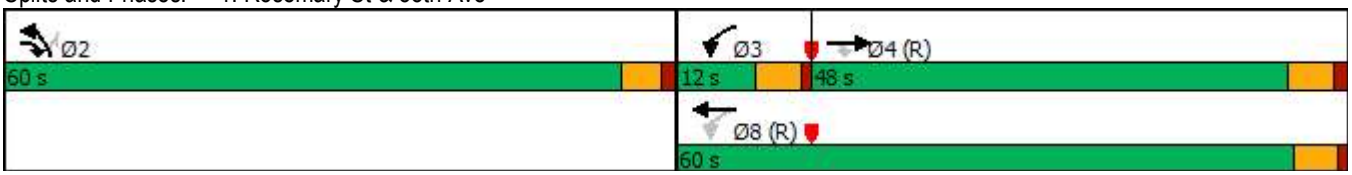
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	268	683	32	252	308	18
Future Volume (vph)	268	683	32	252	308	18
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	48.0	60.0	12.0	60.0	60.0	60.0
Total Split (%)	40.0%	50.0%	10.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	47.3	109.8	55.0	55.0	55.0	55.0
Actuated g/C Ratio	0.39	0.92	0.46	0.46	0.46	0.46
v/c Ratio	0.39	0.48	0.09	0.37	0.44	0.03
Control Delay	29.5	1.3	18.8	23.1	24.4	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	1.3	18.8	23.1	24.4	10.5
LOS	C	A	B	C	C	B
Approach Delay	9.2			22.6	23.7	
Approach LOS	A			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 54.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	268	683	32	252	308	18
Future Volume (veh/h)	268	683	32	252	308	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1559	1559	1693	1693
Adj Flow Rate, veh/h	276	704	33	260	318	19
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	6	23	23	14	14
Cap, veh/h	953	1511	310	929	739	657
Arrive On Green	0.53	0.53	0.03	0.60	0.46	0.46
Sat Flow, veh/h	1811	1535	1485	1559	1612	1434
Grp Volume(v), veh/h	276	704	33	260	318	19
Grp Sat Flow(s),veh/h/ln	1811	1535	1485	1559	1612	1434
Q Serve(g_s), s	10.2	1.6	1.2	9.7	16.0	0.9
Cycle Q Clear(g_c), s	10.2	1.6	1.2	9.7	16.0	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	953	1511	310	929	739	657
V/C Ratio(X)	0.29	0.47	0.11	0.28	0.43	0.03
Avail Cap(c_a), veh/h	953	1511	355	929	739	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	0.0	12.0	11.8	21.9	17.8
Incr Delay (d2), s/veh	0.8	1.0	0.1	0.8	1.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	17.2	0.4	3.5	6.4	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.6	1.1	12.2	12.5	23.8	17.9
LnGrp LOS	B	A	B	B	C	B
Approach Vol, veh/h	980			293	337	
Approach Delay, s/veh	5.4			12.5	23.4	
Approach LOS	A			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	60.0	8.3	69.2	77.5
Change Period (Y+Rc), s	5.0	5.0	5.5	* 5.5
Max Green Setting (Gmax), s	55.0	7.0	42.5	* 55
Max Q Clear Time (g_c+I1), s	18.0	3.2	12.2	11.7
Green Ext Time (p_c), s	1.1	0.0	5.1	1.7

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

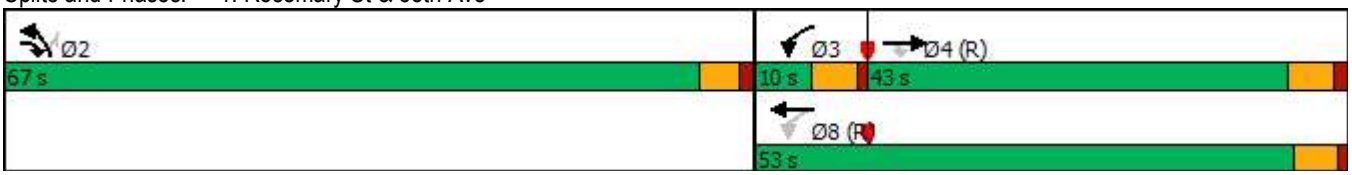
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	296	530	29	483	636	19
Future Volume (vph)	296	530	29	483	636	19
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	43.0	67.0	10.0	53.0	67.0	67.0
Total Split (%)	35.8%	55.8%	8.3%	44.2%	55.8%	55.8%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	41.5	111.0	48.0	48.0	62.0	62.0
Actuated g/C Ratio	0.35	0.92	0.40	0.40	0.52	0.52
v/c Ratio	0.50	0.38	0.10	0.70	0.73	0.02
Control Delay	35.7	0.9	22.9	36.5	28.6	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	0.9	22.9	36.5	28.6	10.7
LOS	D	A	C	D	C	B
Approach Delay	13.4			35.7	28.0	
Approach LOS	B			D	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	296	530	29	483	636	19
Future Volume (veh/h)	296	530	29	483	636	19
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1811	1811	1856	1856
Adj Flow Rate, veh/h	308	552	30	503	662	20
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	6	6	3	3
Cap, veh/h	843	1501	326	973	913	812
Arrive On Green	0.47	0.47	0.03	0.54	0.52	0.52
Sat Flow, veh/h	1796	1522	1725	1811	1767	1572
Grp Volume(v), veh/h	308	552	30	503	662	20
Grp Sat Flow(s),veh/h/ln	1796	1522	1725	1811	1767	1572
Q Serve(g_s), s	13.2	0.9	1.0	21.3	34.7	0.7
Cycle Q Clear(g_c), s	13.2	0.9	1.0	21.3	34.7	0.7
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	843	1501	326	973	913	812
V/C Ratio(X)	0.37	0.37	0.09	0.52	0.73	0.02
Avail Cap(c_a), veh/h	843	1501	352	973	913	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	0.0	15.6	17.8	22.4	14.2
Incr Delay (d2), s/veh	1.2	0.7	0.1	2.0	5.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	13.1	0.4	9.2	15.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.6	0.7	15.7	19.7	27.4	14.3
LnGrp LOS	C	A	B	B	C	B
Approach Vol, veh/h	860			533	682	
Approach Delay, s/veh	8.2			19.5	27.0	
Approach LOS	A			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	67.0	8.2	62.3	70.5
Change Period (Y+Rc), s	5.0	5.0	5.5	* 5.5
Max Green Setting (Gmax), s	62.0	5.0	37.5	* 48
Max Q Clear Time (g_c+I1), s	36.7	3.0	15.2	23.3
Green Ext Time (p_c), s	2.5	0.0	4.2	3.4

Intersection Summary	
HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

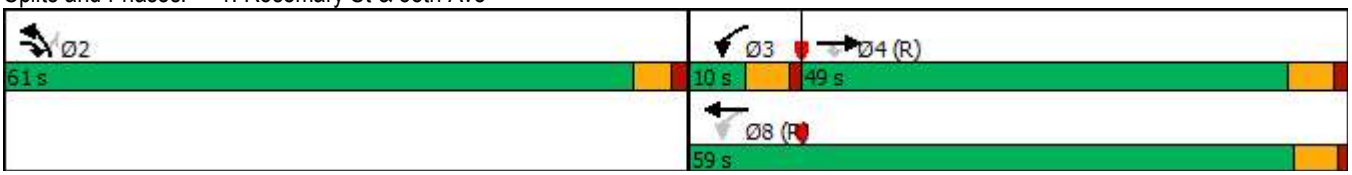
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	351	872	33	330	400	22
Future Volume (vph)	351	872	33	330	400	22
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	49.0	61.0	10.0	59.0	61.0	61.0
Total Split (%)	40.8%	50.8%	8.3%	49.2%	50.8%	50.8%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	47.5	111.0	54.0	54.0	56.0	56.0
Actuated g/C Ratio	0.40	0.92	0.45	0.45	0.47	0.47
v/c Ratio	0.51	0.61	0.12	0.49	0.56	0.03
Control Delay	31.7	2.0	19.7	26.3	26.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	2.0	19.7	26.3	26.7	10.9
LOS	C	A	B	C	C	B
Approach Delay	10.5			25.7	25.9	
Approach LOS	B			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	351	872	33	330	400	22
Future Volume (veh/h)	351	872	33	330	400	22
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1559	1559	1693	1693
Adj Flow Rate, veh/h	362	899	34	340	412	23
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	6	23	23	14	14
Cap, veh/h	937	1511	245	916	752	669
Arrive On Green	0.52	0.52	0.03	0.59	0.47	0.47
Sat Flow, veh/h	1811	1535	1485	1559	1612	1434
Grp Volume(v), veh/h	362	899	34	340	412	23
Grp Sat Flow(s),veh/h/ln	1811	1535	1485	1559	1612	1434
Q Serve(g_s), s	14.5	2.7	1.2	13.8	22.0	1.0
Cycle Q Clear(g_c), s	14.5	2.7	1.2	13.8	22.0	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	937	1511	245	916	752	669
V/C Ratio(X)	0.39	0.60	0.14	0.37	0.55	0.03
Avail Cap(c_a), veh/h	937	1511	265	916	752	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.5	0.0	13.1	13.1	22.9	17.3
Incr Delay (d2), s/veh	1.2	1.7	0.3	1.2	2.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	28.1	0.4	5.0	8.8	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.7	1.8	13.4	14.2	25.8	17.4
LnGrp LOS	B	A	B	B	C	B
Approach Vol, veh/h	1261			374	435	
Approach Delay, s/veh	6.6			14.1	25.3	
Approach LOS	A			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	61.0	8.4	68.1	76.5
Change Period (Y+Rc), s	5.0	5.0	5.5	* 5.5
Max Green Setting (Gmax), s	56.0	5.0	43.5	* 54
Max Q Clear Time (g_c+I1), s	24.0	3.2	16.5	15.8
Green Ext Time (p_c), s	1.5	0.0	7.4	2.3

Intersection Summary	
HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B

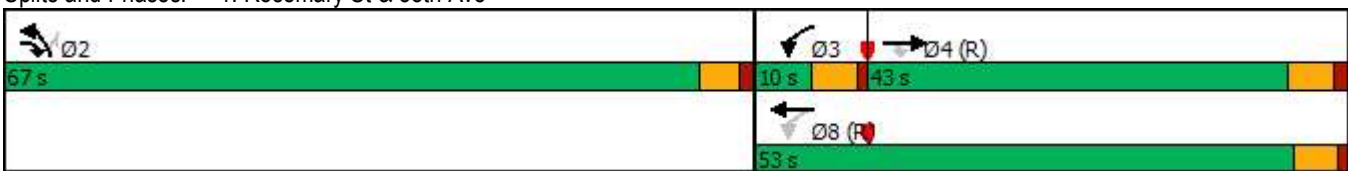
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	387	692	37	633	817	18
Future Volume (vph)	387	692	37	633	817	18
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	43.0	67.0	10.0	53.0	67.0	67.0
Total Split (%)	35.8%	55.8%	8.3%	44.2%	55.8%	55.8%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	41.5	111.0	48.0	48.0	62.0	62.0
Actuated g/C Ratio	0.35	0.92	0.40	0.40	0.52	0.52
v/c Ratio	0.66	0.50	0.16	0.92	0.94	0.02
Control Delay	40.5	1.3	23.9	54.0	46.7	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	1.3	23.9	54.0	46.7	11.2
LOS	D	A	C	D	D	B
Approach Delay	15.4			52.3	45.9	
Approach LOS	B			D	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	387	692	37	633	817	18
Future Volume (veh/h)	387	692	37	633	817	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1811	1811	1856	1856
Adj Flow Rate, veh/h	403	721	39	659	851	19
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	6	6	3	3
Cap, veh/h	836	1495	260	973	913	812
Arrive On Green	0.47	0.47	0.03	0.54	0.52	0.52
Sat Flow, veh/h	1796	1522	1725	1811	1767	1572
Grp Volume(v), veh/h	403	721	39	659	851	19
Grp Sat Flow(s),veh/h/ln	1796	1522	1725	1811	1767	1572
Q Serve(g_s), s	18.6	1.9	1.4	31.7	53.9	0.7
Cycle Q Clear(g_c), s	18.6	1.9	1.4	31.7	53.9	0.7
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	836	1495	260	973	913	812
V/C Ratio(X)	0.48	0.48	0.15	0.68	0.93	0.02
Avail Cap(c_a), veh/h	836	1495	280	973	913	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	16.7	20.2	27.0	14.2
Incr Delay (d2), s/veh	2.0	1.1	0.3	3.8	17.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	20.9	0.6	14.0	26.1	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.1	1.2	16.9	24.0	44.3	14.2
LnGrp LOS	C	A	B	C	D	B
Approach Vol, veh/h	1124			698	870	
Approach Delay, s/veh	9.4			23.6	43.7	
Approach LOS	A			C	D	

Timer - Assigned Phs	2	3	4		8
Phs Duration (G+Y+Rc), s	67.0	8.6	61.9		70.5
Change Period (Y+Rc), s	5.0	5.0	5.5		* 5.5
Max Green Setting (Gmax), s	62.0	5.0	37.5		* 48
Max Q Clear Time (g_c+I1), s	55.9	3.4	20.6		33.7
Green Ext Time (p_c), s	2.0	0.0	5.4		3.9

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

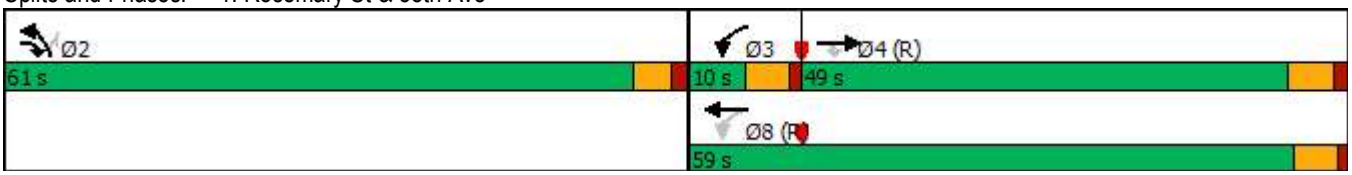
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	351	890	40	330	403	23
Future Volume (vph)	351	890	40	330	403	23
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	49.0	61.0	10.0	59.0	61.0	61.0
Total Split (%)	40.8%	50.8%	8.3%	49.2%	50.8%	50.8%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	45.5	108.0	54.0	54.0	56.0	56.0
Actuated g/C Ratio	0.38	0.90	0.45	0.45	0.47	0.47
v/c Ratio	0.53	0.63	0.15	0.49	0.56	0.04
Control Delay	33.3	2.3	20.1	26.3	26.8	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	2.3	20.1	26.3	26.8	11.0
LOS	C	A	C	C	C	B
Approach Delay	11.0			25.6	26.0	
Approach LOS	B			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 16.8	Intersection LOS: B
Intersection Capacity Utilization 67.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	351	890	40	330	403	23
Future Volume (veh/h)	351	890	40	330	403	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1559	1559	1693	1693
Adj Flow Rate, veh/h	362	918	41	340	415	24
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	6	23	23	14	14
Cap, veh/h	932	1506	246	916	752	669
Arrive On Green	0.51	0.51	0.03	0.59	0.47	0.47
Sat Flow, veh/h	1811	1535	1485	1559	1612	1434
Grp Volume(v), veh/h	362	918	41	340	415	24
Grp Sat Flow(s),veh/h/ln	1811	1535	1485	1559	1612	1434
Q Serve(g_s), s	14.5	3.3	1.5	13.8	22.2	1.1
Cycle Q Clear(g_c), s	14.5	3.3	1.5	13.8	22.2	1.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	932	1506	246	916	752	669
V/C Ratio(X)	0.39	0.61	0.17	0.37	0.55	0.04
Avail Cap(c_a), veh/h	932	1506	261	916	752	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	0.1	13.2	13.1	23.0	17.4
Incr Delay (d2), s/veh	1.2	1.8	0.3	1.2	2.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	28.7	0.5	5.0	8.9	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.9	1.9	13.5	14.2	25.9	17.5
LnGrp LOS	B	A	B	B	C	B
Approach Vol, veh/h	1280			381	439	
Approach Delay, s/veh	6.7			14.1	25.4	
Approach LOS	A			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	61.0	8.7	67.8	76.5
Change Period (Y+Rc), s	5.0	5.0	5.5	* 5.5
Max Green Setting (Gmax), s	56.0	5.0	43.5	* 54
Max Q Clear Time (g_c+I1), s	24.2	3.5	16.5	15.8
Green Ext Time (p_c), s	1.5	0.0	7.6	2.3

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

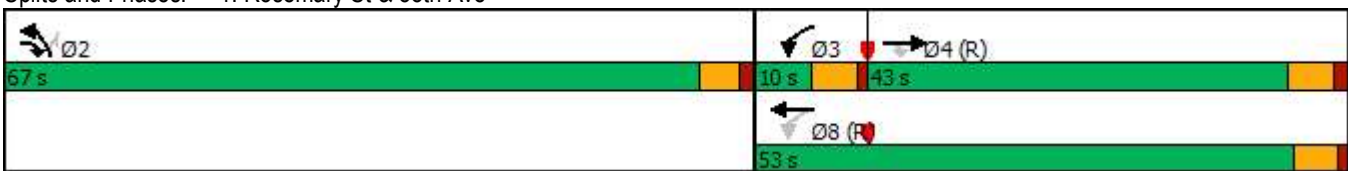
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	387	694	38	633	829	23
Future Volume (vph)	387	694	38	633	829	23
Turn Type	NA	pm+ov	pm+pt	NA	Prot	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.0	10.0	23.0	23.0	23.0
Total Split (s)	43.0	67.0	10.0	53.0	67.0	67.0
Total Split (%)	35.8%	55.8%	8.3%	44.2%	55.8%	55.8%
Yellow Time (s)	4.0	3.5	4.0	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.0	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	Max	None	C-Max	Max	Max
Act Effct Green (s)	39.5	108.0	48.0	48.0	62.0	62.0
Actuated g/C Ratio	0.33	0.90	0.40	0.40	0.52	0.52
v/c Ratio	0.69	0.51	0.17	0.92	0.95	0.03
Control Delay	43.0	1.4	24.0	54.0	49.3	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	1.4	24.0	54.0	49.3	11.3
LOS	D	A	C	D	D	B
Approach Delay	16.3			52.3	48.3	
Approach LOS	B			D	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 36.0	Intersection LOS: D
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Rosemary St & 88th Ave



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	387	694	38	633	829	23
Future Volume (veh/h)	387	694	38	633	829	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1811	1811	1856	1856
Adj Flow Rate, veh/h	403	723	40	659	864	24
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	6	6	3	3
Cap, veh/h	836	1495	260	973	913	812
Arrive On Green	0.47	0.47	0.03	0.54	0.52	0.52
Sat Flow, veh/h	1796	1522	1725	1811	1767	1572
Grp Volume(v), veh/h	403	723	40	659	864	24
Grp Sat Flow(s),veh/h/ln	1796	1522	1725	1811	1767	1572
Q Serve(g_s), s	18.6	2.0	1.4	31.7	55.5	0.9
Cycle Q Clear(g_c), s	18.6	2.0	1.4	31.7	55.5	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	836	1495	260	973	913	812
V/C Ratio(X)	0.48	0.48	0.15	0.68	0.95	0.03
Avail Cap(c_a), veh/h	836	1495	279	973	913	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	16.7	20.2	27.4	14.2
Incr Delay (d2), s/veh	2.0	1.1	0.3	3.8	19.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	21.0	0.6	14.0	27.2	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.1	1.2	16.9	24.0	46.7	14.3
LnGrp LOS	C	A	B	C	D	B
Approach Vol, veh/h	1126			699	888	
Approach Delay, s/veh	9.4			23.6	45.9	
Approach LOS	A			C	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		67.0	8.7	61.8		70.5
Change Period (Y+Rc), s		5.0	5.0	5.5		* 5.5
Max Green Setting (Gmax), s		62.0	5.0	37.5		* 48
Max Q Clear Time (g_c+I1), s		57.5	3.4	20.6		33.7
Green Ext Time (p_c), s		1.6	0.0	5.4		3.9

Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	326	694	21
Future Vol, veh/h	0	1	0	326	694	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	0	354	754	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	766	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	403	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	403	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	403	-	-
HCM Lane V/C Ratio	-	0.003	-	-
HCM Control Delay (s)	-	14	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	0	654	556	2
Future Vol, veh/h	0	5	0	654	556	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	0	711	604	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	605	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	498	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	498	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	498	-	-
HCM Lane V/C Ratio	-	0.011	-	-
HCM Control Delay (s)	-	12.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	426	909	21
Future Vol, veh/h	0	1	0	426	909	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	0	463	988	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1000	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	295	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	295	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	295	-	-
HCM Lane V/C Ratio	-	0.004	-	-
HCM Control Delay (s)	-	17.2	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	0	851	729	2
Future Vol, veh/h	0	5	0	851	729	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	0	925	792	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	793	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	389	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	389	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	389	-	-
HCM Lane V/C Ratio	-	0.014	-	-
HCM Control Delay (s)	-	14.4	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	0	11	322	691	4
Future Vol, veh/h	4	0	11	322	691	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	0	12	350	751	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1127	753	755	0	-	0
Stage 1	753	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	226	410	855	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	223	410	855	-	-	-
Mov Cap-2 Maneuver	347	-	-	-	-	-
Stage 1	458	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.5	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	855	-	347	-	-
HCM Lane V/C Ratio	0.014	-	0.013	-	-
HCM Control Delay (s)	9.3	-	15.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	2	1	638	561	0
Future Vol, veh/h	16	2	1	638	561	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	2	1	693	610	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1305	610	610	0	-	0
Stage 1	610	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	177	494	969	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	177	494	969	-	-	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	541	-	-	-	-	-
Stage 2	495	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	969	-	329	-	-
HCM Lane V/C Ratio	0.001	-	0.059	-	-
HCM Control Delay (s)	8.7	-	16.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	0	11	422	906	4
Future Vol, veh/h	4	0	11	422	906	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	0	12	459	985	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1470	987	989	0	-	0
Stage 1	987	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	140	300	699	-	-	-
Stage 1	361	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	138	300	699	-	-	-
Mov Cap-2 Maneuver	263	-	-	-	-	-
Stage 1	355	-	-	-	-	-
Stage 2	620	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.9	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	699	-	263	-	-
HCM Lane V/C Ratio	0.017	-	0.017	-	-
HCM Control Delay (s)	10.2	-	18.9	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	2	1	835	734	0
Future Vol, veh/h	16	2	1	835	734	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	2	1	908	798	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1708	798	798	0	-	0
Stage 1	798	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	100	386	824	-	-	-
Stage 1	443	-	-	-	-	-
Stage 2	393	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	100	386	824	-	-	-
Mov Cap-2 Maneuver	236	-	-	-	-	-
Stage 1	443	-	-	-	-	-
Stage 2	393	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	824	-	247	-	-
HCM Lane V/C Ratio	0.001	-	0.079	-	-
HCM Control Delay (s)	9.4	-	20.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

APPENDIX E

Queues Analysis Worksheets

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	276	704	33	260	318	19
v/c Ratio	0.39	0.48	0.09	0.37	0.44	0.03
Control Delay	29.5	1.3	18.8	23.1	24.4	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	1.3	18.8	23.1	24.4	10.5
Queue Length 50th (ft)	162	0	14	128	163	3
Queue Length 95th (ft)	242	12	33	196	243	16
Internal Link Dist (ft)	246			258	414	
Turn Bay Length (ft)		100	175			75
Base Capacity (vph)	706	1454	356	708	725	656
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.48	0.09	0.37	0.44	0.03

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	308	552	30	503	663	20
v/c Ratio	0.50	0.38	0.10	0.70	0.73	0.02
Control Delay	35.7	0.9	22.9	36.5	28.6	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	0.9	22.9	36.5	28.6	10.7
Queue Length 50th (ft)	198	0	14	321	386	5
Queue Length 95th (ft)	291	9	34	451	539	18
Internal Link Dist (ft)	246			258	414	
Turn Bay Length (ft)		100	175			75
Base Capacity (vph)	614	1437	307	716	905	813
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.38	0.10	0.70	0.73	0.02

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	362	918	41	340	415	24
v/c Ratio	0.53	0.63	0.15	0.49	0.56	0.04
Control Delay	33.3	2.3	20.1	26.3	26.8	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	2.3	20.1	26.3	26.8	11.0
Queue Length 50th (ft)	222	6	18	182	227	4
Queue Length 95th (ft)	321	18	39	269	329	20
Internal Link Dist (ft)	246			258	414	
Turn Bay Length (ft)		100	175			75
Base Capacity (vph)	679	1454	277	695	738	668
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.63	0.15	0.49	0.56	0.04

Intersection Summary

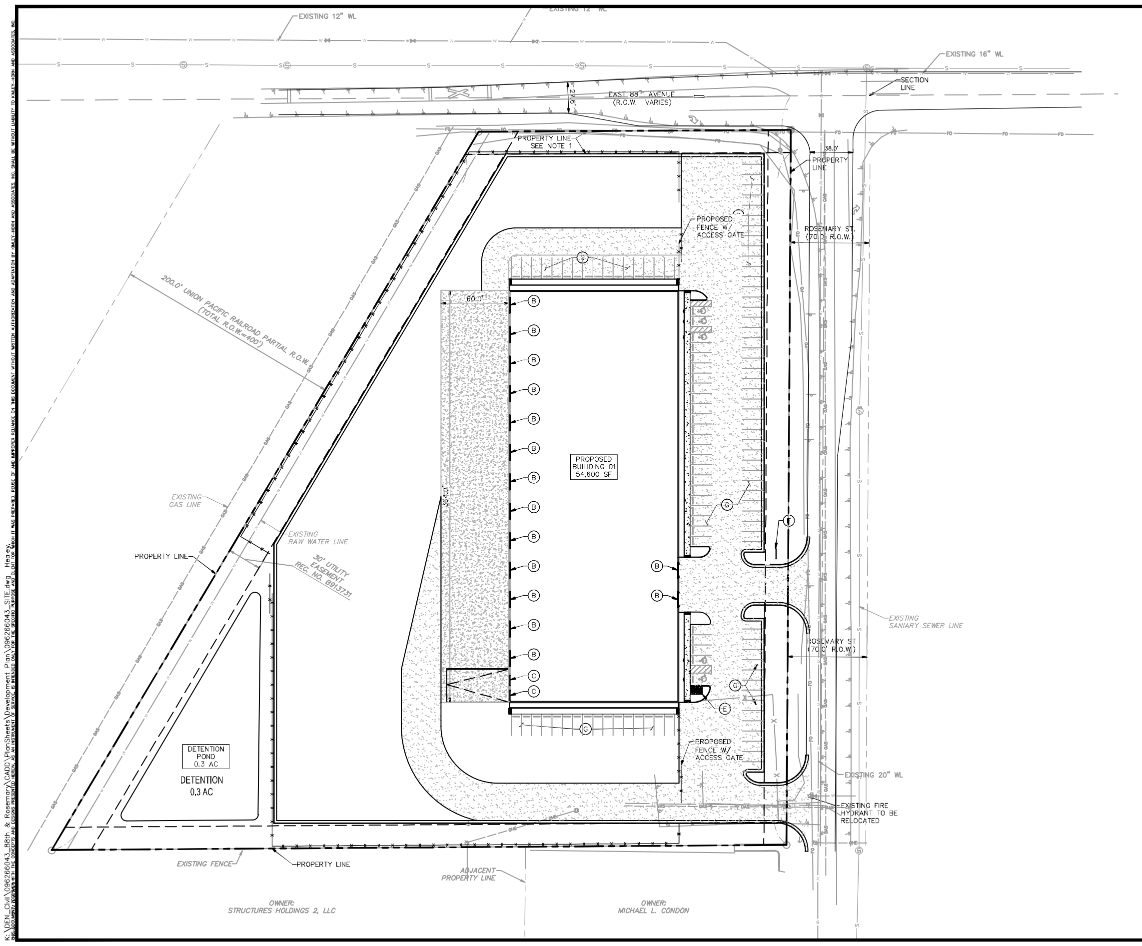
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	403	723	40	659	864	24
v/c Ratio	0.69	0.51	0.17	0.92	0.95	0.03
Control Delay	43.0	1.4	24.0	54.0	49.3	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	1.4	24.0	54.0	49.3	11.3
Queue Length 50th (ft)	277	0	19	478	616	6
Queue Length 95th (ft)	397	10	42	#713	#908	20
Internal Link Dist (ft)	246			258	414	
Turn Bay Length (ft)		100	175			75
Base Capacity (vph)	585	1430	231	716	905	813
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.51	0.17	0.92	0.95	0.03

Intersection Summary

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

APPENDIX F

Conceptual Site Plan



LEGEND

- SITE PROPERTY LINE
- 20' LANDSCAPE SETBACK
- EASEMENT LINE
- PROPOSED SITE FENCE
- PROPOSED DECORATIVE FENCE
- EMPLOYEE PARKING SPACE COUNT
- PROPOSED LANDSCAPE
- PROPOSED LIGHT DUTY ASPHALT PAVEMENT
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CRUSHED GRAVEL
- PROPOSED FIRE HYDRANT

NOTES

1. POTENTIAL AREA OF CONCERN: THE PALIOMBO AND AGAZIO SUBDIVISION PLAT, RECORDER AT RECEPTION NO. B494523 OF THE ADAMS COUNTY RECODS, CONTAINS CONFLICTING INFORMATION IN REGARDS TO THE NORTH LINE OF LOT 1. BOTH LINES ARE SHOWN HERE FOR REFERENCE.

SITE KEYNOTES

- (A) STOP SIGN AND STOP BAR
- (B) 14'X16' DRIVE–THROUGH DOOR (TYP.)
- (C) 9'X 10' OVERHEAD DOOR (TYP.)
- (D) ENTRY DOOR TO BUILDING
- (E) BIKE RACK
- (F) MONUMENT SIGN
- (G) 9'X19' PARKING STALL
- (H) 9'X19' PARKING STALL (TYP.)
- (I) HANDICAPPED PARKING WITH SIGNAGE (TYP.)
- (J) HANDICAPPED PARKING(VAN ACCESSIBLE) WITH SIGNAGE (TYP.)

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

Know what's below. Call before you dig.

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn
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4582 South Ulster Street, Suite 1500
Denver, Colorado 80237 (303) 228-2300

DESIGNED BY: SLP
DRAWN BY: JAQ
CHECKED BY: SLP
DATE: 07/06/2022

E. 88TH AVE. & ROSEMARY ST.

COMMERCE CITY, CO

SITE DEVELOPMENT PLAN

SITE PLAN

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

PROJECT NO.
096266043

DRAWING NAME
096266043_SITE