



May 16, 2022

David Nevarez  
City of Dallas  
Dallas City Hall  
1500 Marilla St.  
Dallas, Texas 75201



*Steven Dean Cherryholmes*

05/16/2022

#### ***RE: Z190-223 Engineering Comments from April 2022***

Dear David:

Please accept this letter as a supplement to a prior traffic impact analysis (TIA) submitted by DeShazo Group in February 2019 for the proposed Belt Line Subdivision (the “Project”) to be located in the northwest quadrant of S Belt Line Road at Seagoville Road in Dallas, Texas. The subject site is currently vacant. The proposed project will consist of commercial retail, single-family, and multi-family housing. This supplemental memo is in response to feedback received from City staff as part of their review of the project.

## **SUMMARY OF FINDINGS**

The development plan is largely unchanged, save for two aspects: the number of townhome units has increased from 192 to 212, and site access has changed. The townhome section may be accessed via four driveways: two located at Edd Road to the north and two located on Garden Grove Drive to the west.

### **INTERSECTION CAPACITY ANALYSIS**

**FINDING:** DeShazo performed a Level-of-Service (LOS) analysis of all site driveways (including the driveway on Belt Line Road which serves the retail component of the development) by adding site-generated trips to background traffic. The resultant analysis revealed that all site driveways are expected to operate with an acceptable LOS (LOS D or better) during peak traffic hours.

**RECOMMENDATIONS:** No mitigation measures are required.

### **SITE ACCESS ANALYSIS**

DeShazo Group also analyzed deceleration lane requirements, driveway spacing, and sight distance criteria for the development.

**DRIVEWAY SPACING FINDING:** All site driveways meet driveway spacing criteria with the exception of Driveway 4 on Edd Road. The required site driveway spacing on Edd Road (a four-lane thoroughfare) is 335 feet, but only approximately 215 feet of space is provided from the intersection of Edd Road and Garden Grove Drive to Driveway 4.

**DECELERATION LANES FINDING:** Based upon the projected volumes derived in this study, no turning movements into any of the site driveways exceed 120 vehicles during the peak hour. Thus, no deceleration lanes are merited.

**INTERSECTION SIGHT DISTANCE FINDING:** A cursory review of the proposed site driveway with Google Earth found that it satisfies the intersection sight distance criteria. [NOTE: This does not rule out the potential that other impediments such as landscaping, signage, etc. may exist.]

DeShazo encourages the client to meet with the City of Dallas and confirm the location of Driveway 4 and discuss parking/internal circulation constraints. Otherwise, DeShazo recommends the amended development plan be approved.

**RECOMMENDATIONS:**

- Driveway 4, under the current development plan, aligns with Garden Grove Drive north, providing a convenient connection to local transportation infrastructure. DeShazo recommends approving Driveway 4 as it will form a perfect 4-legged intersection as opposed to an offset intersection.
- Given the updated development plan, no site driveways merit a deceleration lane. No mitigation measure required.
- DeShazo recommends providing standard 20-foot visibility triangles at each of the four site driveways.

## CHANGES TO DEVELOPMENT

This analysis considered the retail use and townhome units only. The retail and townhome units are proposed to be built by 2023. The analysis was performed with the 2023 set as the full buildout year. The development program is summarized as follows in **Table 1**.

**Table 1. Development Program Summary**

Land Uses	Quantity	Buildout Year
Townhomes	212 DU	2023
Retail	10,600 SF	2023

The trip generation for the project is shown in **Table 2** below:

**Table 2. Trip Generation**

ITE Code	ITE Land Use	Quantity	Weekday Trips	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
230	Condominium/ Townhome	212 DU	1,237	94	16	78	111	74	37
820	Shopping Center	10,600 SF	1,579	40	25	15	133	64	69
<i>Subtotals:</i>			2,816	134	41	93	244	138	106
<i>Totals:</i>			2,816	134	41	93	244	138	106

While total retail square-footage and related access driveway remain unchanged, the number of townhomes and access to the townhome section has changed. The current development plan includes 212 townhome units and four access drives: two on Garden Grove Drive to the west and two on Edd Road to the north. Traffic distribution was changed to reflect this.

**Table 3. Intersection Analysis**

Intersections	Traffic Movement	2023 Background + Site	
		AM	PM
<b>Unsignalized Intersection (TWSC)</b>			
<u>Belt Line Road at</u> Driveway 1	SBLR EBT EBL	B (12.7) A (0.2) B (11.8)	B (14.7) A (0.5) B (12.1)
<u>Driveway 2 at</u> Garden Grove Drive	WBL	B (10.4)	A (9.2)
<u>Driveway 3 at</u> Garden Grove Drive	WBL SBL	A (9.4) A (7.5)	A (8.8) A (7.4)
<u>Driveway 4 at</u> Edd Road	NBLR WBL	B (12.0) A (0.0)	A (9.8) A (7.5)
<u>Driveway 5 at</u> Edd Road	NBLR WBL	B (10.6) A (7.9)	A (9.2) A (7.5)

**FINDING:** The analysis was performed for the proposed site driveways only. All the other study intersections are expected to operate at an acceptable level of service with or without the changed development program. The detailed software output for the analyzed intersections is provided in the **Appendix**.

## DRIVEWAY SPACING REVIEW

### CITY OF DALLAS DRIVEWAY SPACING CRITERIA:

The driveway spacing parameters for the City of Dallas are summarized in the City's *Off-Street Parking and Driveways Handbook- Table 1/ Figure 1 and Figure 2 (Appendix D)*. The City determines the driveway spacing distance measured from the edges of driveway throat if the driveway width is 15' or greater. The City requires the following driveway spacing relative to the Project.

- Minimum Driveway Spacing:
  - Local Street: 20 feet
- Minimum Distance from Driveway to Intersection:
  - Local Street: 40 feet

A summary of all driveways, adjacent roadway speeds, and spacing criteria is provided as follows in **Table 4**.

**Table 4. Driveway Spacing Summary**

Spacing Between	Requirements	Speed Limit	Required (Ft)	Provided (Ft)	Meets Requirements
Driveway 1 and Belt Line Road	Dallas	40	445 <sup>[1]</sup>	~445	Yes
Driveway 2 and Garden Grove Drive	Dallas	30	335	~465	Yes
Driveway 3 and Garden Grove Drive	Dallas	30	335	~335	Yes
Driveway 4 and Edd Road	Dallas	30	335	~215	No
Driveway 5 and Edd Road	Dallas	30	335	~940	Yes

<sup>[1]</sup> Standard has taken from AASHTO Green Book Exhibit 9-55.

**FINDING:** All site driveways meet driveway spacing criteria with the exception of Driveway 4 on Edd Road. The required site driveway spacing on Edd Road (a four-lane thoroughfare) is 335 feet, but only approximately 215 feet of space is provided from the intersection of Edd Road and Garden Grove Drive to Driveway 4.

## DECELERATION LANE REVIEW

### CITY OF DALLAS RIGHT-TURN DECELERATION LANE CRITERIA:

The City of Dallas *Development Guidelines* provides the requirement for deceleration lane. According to *Dallas Development Guidelines*, a deceleration lane is required for right turning volumes exceeding 120 vehicles during the peak hour.

**FINDING:** Based upon the projected volumes derived in this study, no turning movements into any of the site driveways exceed 120 vehicles during the peak hour. Thus, no deceleration lanes are merited.

## INTERSECTION SIGHT DISTANCE REVIEW

### **INTERSECTION SIGHT DISTANCE CRITERIA:**

Sight distance is the metric used to describe the ability of a motorist to physically see (via a direct line of sight) objects and/or other vehicles to a degree sufficient to allow safe and efficient use of a roadway in an intended manner. The sight distance is a function of the major roadway's geometric characteristics and 85<sup>th</sup> percentile speed.

**FINDING:** A cursory review of the proposed site driveway with Google Earth found that it satisfies the intersection sight distance criteria. [NOTE: This does not rule out the potential that other impediments such as landscaping, signage, etc. may exist.]

DeShazo encourages the client to meet with the City of Dallas and confirm the location of Driveway 4 and discuss parking/internal circulation constraints. Otherwise, DeShazo recommends the amended development plan be approved.

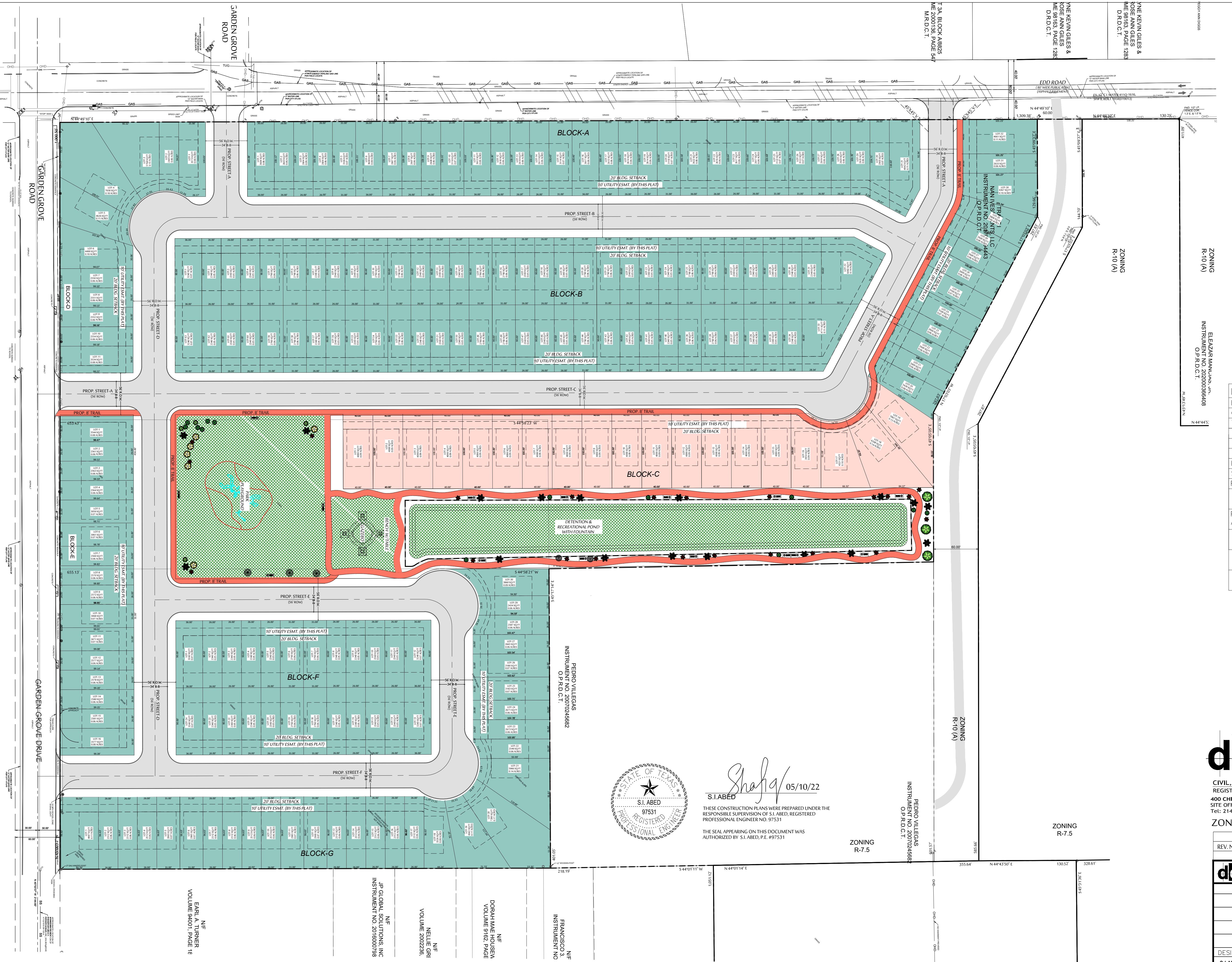
If you have additional comments regarding this project, please contact Mr. Onkar Dhondkar at 214-584-6521.

Sincerely,  
DESHAZO GROUP, INC.

Steve Cherryholmes, P.E.  
Principal

***END OF MEMO***

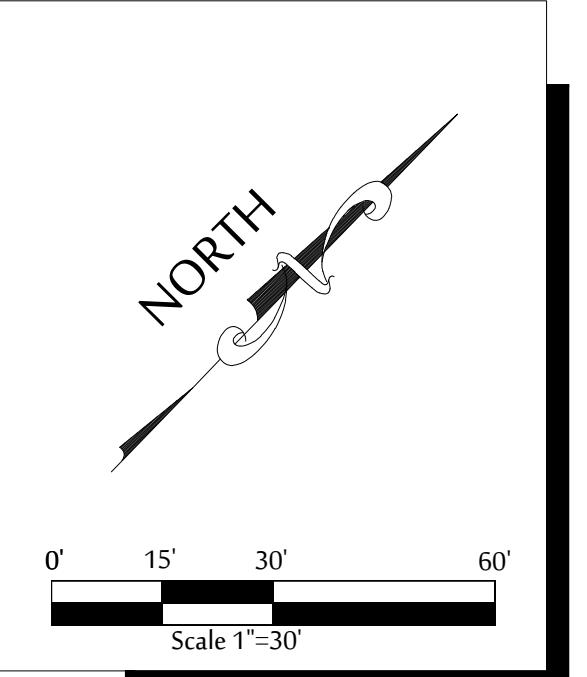
## **APPENDIX**



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# **VICINITY MAP (N.T.S.)**

**MAPSCO NO: 68-D**



LAND INFORMATION	
Zoning	R 7.5
Block	BLOCK-6045
Total Site Area	22.946 Ac (999,511 sq. ft.)
Sizes	No. of Lots
Front Setback	Min. 20'(EXCEPT 10' AT EYE BROW)
Side Setback	5'-10'
Depth Setback	5'
WATER & POND	3.06 Ac(133,277 sq.ft.)
Planned Elderly Living 4000 SQ.Ft.	19 Homes
MIN HOMES 10 SQ.Ft.MIN.	188 Homes
Trail	
	PARK BENCH & TRASH CAN

#### **BENCHMARKS:**

M #1-BENCHMARK IS AN X-CUT ON THE EAST EDGE OF THE  
EWALK RUNNING ALONG THE WEST LINE OF THE PROPERTY  
D IS 7.5' SW OF THE 1/2-INCH IRON ROD FOUND FOR THE  
TERSECTION OF THE EAST LINE OF WALTON WALKER BLVD AND  
E SOUTH LINE OF EXCHANGE SERVICE DRIVE. ELEV: 679.39'

M#2-BENCHMARK IS AN X-CUT ON THE EAST EDGE OF THE  
PARKWALK RUNNING ALONG THE WEST LINE OF THE PROPERTY  
AND IS LOCATED ACROSS FROM THE 1/2-INCH IRON ROD FOUND  
AT THE SOUTHWEST CORNER OF THE PROPERTY. BENCHMARK IS  
4 FEET W/SW OF SAID IRON. ELEV: 673.16'

# ddc DESIGN DEVELOPMENT CONSULTANTS, INC.

**CIVIL, MUNICIPAL & LAND DEVELOPMENT CONSULTANT**  
REGISTRATION # 10970

**400 CHISHOLM PLACE. SUITE 310, PLANO, TX 75075.  
SITE OFFICE: 503 WADE COURT, EULESS, TX, 76039.**

Tel: 214-868-9320 Email- abed.ddc@gmail.com

ZONING CASE NO: Z-212-18/

REVISIONS		
REV. NO.	DATE	DESCRIPTION

REV. NO.	DATE	DESCRIPTION

 ddc DESIGN DEVELOPMENT CONSULTANTS

**dac** DESIGN DEVELOPMENT  
CONSULTANTS, INC. DESIGN DEVELOPMENT

**CONFIDENTIAL SITE PLAN RD FOR DECISION**

# CONCEPTUAL SITE PLAN-PD FOR RESID

1028 EDD ROAD, DALLAS, TX, 7523

**DEPARTMENT OF PUBLIC W**

CITY OF DALLAS, TEXAS

DESIGN:	DRAWN	DATE	FILE	NUMBER
SLIPER	24	APRIL	DRXXXX	XXXXXX

S.I.ABED S.A. 2022 DPXXXX XXXX

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HCM 6th TWSC  
10: Garden Grove Road & Driveway 2

2023 Background Plus Site Generated  
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑↑		↑↑		
Traffic Vol, veh/h	13	0	145	3	0	240
Future Vol, veh/h	13	0	145	3	0	240
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	-	-	-	-	-
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	14	0	158	3	0	261
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	291	81	0	0	161	0
Stage 1	160	-	-	-	-	-
Stage 2	131	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	676	963	-	-	1416	-
Stage 1	852	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	676	963	-	-	1416	-
Mov Cap-2 Maneuver	676	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.4	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	676	1416	-	
HCM Lane V/C Ratio	-	-	0.021	-	-	
HCM Control Delay (s)	-	-	10.4	0	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th TWSC  
13: Belt Line Road & Driveway 1

2023 Background Plus Site Generated  
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑↑	↑↑↑	↑		↑	
Traffic Vol, veh/h	20	509	625	6	3	12
Future Vol, veh/h	20	509	625	6	3	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	553	679	7	3	13
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	686	0	-	0	948	343
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	265	-
Critical Hdwy	5.34	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	3.12	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	553	-	-	-	330	557
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	693	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	553	-	-	-	311	557
Mov Cap-2 Maneuver	-	-	-	-	311	-
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	693	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.6	0	12.7			
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	-	-	553	-	-	481
HCM Lane V/C Ratio	-	-	0.039	-	-	0.034
HCM Control Delay (s)	-	-	11.8	0.2	-	12.7
HCM Lane LOS	-	-	B	A	-	B
HCM 95th %tile Q(veh)	-	-	0.1	-	-	0.1

HCM 6th TWSC  
14: Garden Grove Road & Driveway 3

2023 Background Plus Site Generated  
Timing Plan: AM

Intersection									
Int Delay, s/veh	0.4								
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	Y	↑↓			↑↓				
Traffic Vol, veh/h	6	10	144	1	2	233			
Future Vol, veh/h	6	10	144	1	2	233			
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	-	-	-	-	-			
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	7	11	157	1	2	253			
Major/Minor									
Major/Minor	Minor1	Major1	Major2						
Conflicting Flow All	289	79	0	0	158	0			
Stage 1	158	-	-	-	-	-			
Stage 2	131	-	-	-	-	-			
Critical Hdwy	6.84	6.94	-	-	4.14	-			
Critical Hdwy Stg 1	5.84	-	-	-	-	-			
Critical Hdwy Stg 2	5.84	-	-	-	-	-			
Follow-up Hdwy	3.52	3.32	-	-	2.22	-			
Pot Cap-1 Maneuver	678	965	-	-	1419	-			
Stage 1	854	-	-	-	-	-			
Stage 2	881	-	-	-	-	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	677	965	-	-	1419	-			
Mov Cap-2 Maneuver	677	-	-	-	-	-			
Stage 1	854	-	-	-	-	-			
Stage 2	879	-	-	-	-	-			
Approach									
Approach	WB	NB	SB						
HCM Control Delay, s	9.4	0	0.1						
HCM LOS	A								
Minor Lane/Major Mvmt									
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT				
Capacity (veh/h)	-	-	832	1419	-				
HCM Lane V/C Ratio	-	-	0.021	0.002	-				
HCM Control Delay (s)	-	-	9.4	7.5	0				
HCM Lane LOS	-	-	A	A	A				
HCM 95th %tile Q(veh)	-	-	0.1	0	-				

HCM 6th TWSC  
15: Driveway 4/Driveway 6 & Edd Road

2023 Background Plus Site Generated  
Timing Plan: AM

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBC	EBR	WBL	WBC	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↓		↑↓	6	0	155	0	27	0	2	0	0
Traffic Vol, veh/h	0	293	6	0	155	0	27	0	2	0	0	0
Future Vol, veh/h	0	293	6	0	155	0	27	0	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	0	-	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	318	7	0	168	0	29	0	2	0	0	0
Major/Minor												
Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	168	0	0	325	0	0	406	490	163	327	493	84
Stage 1	-	-	-	-	-	-	322	322	-	168	168	-
Stage 2	-	-	-	-	-	-	84	168	-	159	325	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1407	-	-	1231	-	-	529	477	853	602	476	958
Stage 1	-	-	-	-	-	-	664	650	-	817	758	-
Stage 2	-	-	-	-	-	-	915	758	-	827	648	-
Platoon blocked, %	-	-	-	-	-	-						
Mov Cap-1 Maneuver	1407	-	-	1231	-	-	529	477	853	600	476	958
Mov Cap-2 Maneuver	-	-	-	-	-	-	529	477	-	600	476	-
Stage 1	-	-	-	-	-	-	664	650	-	817	758	-
Stage 2	-	-	-	-	-	-	915	758	-	825	648	-
Approach												
Approach	EB	WB	NB	SB								
HCM Control Delay, s	0		0	12								
HCM LOS	B		A									
Minor Lane/Major Mvmt												
Minor Lane/Major Mvmt	NBLn1	EBL	EBC	EBR	WBL	WBC	WBT	WBR	SBLn1			
Capacity (veh/h)	-	543	1407	-	-	1231	-	-	-			
HCM Lane V/C Ratio	0.058	-	-	-	-	-	-	-	-			
HCM Control Delay (s)	12	0	-	-	0	-	-	-	0			
HCM Lane LOS	B	A	-	-	A	-	-	-	A			
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	-	-			

HCM 6th TWSC  
16: Driveway 5 & Edd Road

2023 Background Plus Site Generated  
Timing Plan: AM

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Traffic Vol, veh/h	290	2	2	144	12	8
Future Vol, veh/h	290	2	2	144	12	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	315	2	2	157	13	9
Major/Minor						
Major1		Major2		Minor1		
Conflicting Flow All	0	0	317	0	399	159
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	83	-
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	-	-	1240	-	579	858
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	931	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1240	-	578	858
Mov Cap-2 Maneuver	-	-	-	-	578	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	929	-
Approach						
EB		WB		NB		
HCM Control Delay, s	0		0.1		10.6	
HCM LOS			B			
Minor Lane/Major Mvmt						
NBLn1		EBT	EBR	WBL	WBT	
Capacity (veh/h)	665	-	-	1240	-	
HCM Lane V/C Ratio	0.033	-	-	0.002	-	
HCM Control Delay (s)	10.6	-	-	7.9	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

HCM 6th TWSC  
10: Garden Grove Road & Driveway 2

2023 Background Plus Site Generated  
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y	↑↑		↑↑		
Traffic Vol, veh/h	6	0	66	13	0	64
Future Vol, veh/h	6	0	66	13	0	64
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	-	-	-	-	-
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	7	0	72	14	0	70
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	114	43	0	0	86	0
Stage 1	79	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	870	1018	-	-	1508	-
Stage 1	935	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	870	1018	-	-	1508	-
Mov Cap-2 Maneuver	870	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.2	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	870	1508	-	
HCM Lane V/C Ratio	-	-	0.007	-	-	
HCM Control Delay (s)	-	-	9.2	0	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0	0	-	

HCM 6th TWSC  
13: Belt Line Road & Driveway 1

2023 Background Plus Site Generated  
Timing Plan: PM

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑↑	↑↑↑		Y		
Traffic Vol, veh/h	50	597	601	14	15	54
Future Vol, veh/h	50	597	601	14	15	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	649	653	15	16	59
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	668	0	-	0	1029	334
Stage 1	-	-	-	-	661	-
Stage 2	-	-	-	-	368	-
Critical Hdwy	5.34	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	3.12	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	564	-	-	-	300	565
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	614	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	564	-	-	-	255	565
Mov Cap-2 Maneuver	-	-	-	-	255	-
Stage 1	-	-	-	-	329	-
Stage 2	-	-	-	-	614	-
Approach	EB	WB	SB			
HCM Control Delay, s	1.4	0	14.7			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	-	-	564	-	-	447
HCM Lane V/C Ratio	0.096	-	-	-	-	0.168
HCM Control Delay (s)	12.1	0.5	-	-	-	14.7
HCM Lane LOS	B	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	-	0.6

HCM 6th TWSC  
14: Garden Grove Road & Driveway 3

2023 Background Plus Site Generated  
Timing Plan: PM

Intersection									
Int Delay, s/veh	1								
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	Y		↑↓		↑↓				
Traffic Vol, veh/h	3	5	62	4	10	61			
Future Vol, veh/h	3	5	62	4	10	61			
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	-	-	-	-	-			
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	3	5	67	4	11	66			
Major/Minor									
Major/Minor	Minor1	Major1	Major2						
Conflicting Flow All	124	36	0	0	71	0			
Stage 1	69	-	-	-	-	-			
Stage 2	55	-	-	-	-	-			
Critical Hdwy	6.84	6.94	-	-	4.14	-			
Critical Hdwy Stg 1	5.84	-	-	-	-	-			
Critical Hdwy Stg 2	5.84	-	-	-	-	-			
Follow-up Hdwy	3.52	3.32	-	-	2.22	-			
Pot Cap-1 Maneuver	858	1029	-	-	1527	-			
Stage 1	946	-	-	-	-	-			
Stage 2	961	-	-	-	-	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	852	1029	-	-	1527	-			
Mov Cap-2 Maneuver	852	-	-	-	-	-			
Stage 1	946	-	-	-	-	-			
Stage 2	954	-	-	-	-	-			
Approach									
Approach	WB	NB	SB						
HCM Control Delay, s	8.8	0	1						
HCM LOS	A								
Minor Lane/Major Mvmt									
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT				
Capacity (veh/h)	-	-	955	1527	-				
HCM Lane V/C Ratio	-	-	0.009	0.007	-				
HCM Control Delay (s)	-	-	8.8	7.4	0				
HCM Lane LOS	-	-	A	A	A				
HCM 95th %tile Q(veh)	-	-	0	0	-				

HCM 6th TWSC  
15: Driveway 4/Driveway 6 & Edd Road

2023 Background Plus Site Generated  
Timing Plan: PM

Intersection												
Int Delay, s/veh	0.6											
Movement	E BL	E BT	E BR	W BL	W BT	W BR	N BL	N BT	N BR	S BL	S BT	S BR
Lane Configurations	↑↓		↑↓	↑↓		↑↓	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	0	118	26	2	80	0	13	0	1	0	0	0
Future Vol, veh/h	0	118	26	2	80	0	13	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	0	-	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	128	28	2	87	0	14	0	1	0	0	0
Major/Minor												
Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	87	0	0	156	0	0	190	233	78	155	247	44
Stage 1	-	-	-	-	-	-	142	142	-	91	91	-
Stage 2	-	-	-	-	-	-	48	91	-	64	156	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1507	-	-	1422	-	-	753	666	967	797	654	1017
Stage 1	-	-	-	-	-	-	846	778	-	906	819	-
Stage 2	-	-	-	-	-	-	959	819	-	939	768	-
Platoon blocked, %	-	-	-	-	-	-						
Mov Cap-1 Maneuver	1507	-	-	1422	-	-	752	665	967	795	653	1017
Mov Cap-2 Maneuver	-	-	-	-	-	-	752	665	-	795	653	-
Stage 1	-	-	-	-	-	-	846	778	-	906	818	-
Stage 2	-	-	-	-	-	-	958	818	-	938	768	-
Approach												
Approach	E BL	W BL	N BL	S BL								
HCM Control Delay, s	0	0.2	9.8	0								
HCM LOS	A		A	A								
Minor Lane/Major Mvmt												
Minor Lane/Major Mvmt	NBLn1	E BL	E BT	E BR	W BL	W BT	W BR	N BLn1				
Capacity (veh/h)	764	1507	-	-	1422	-	-	-				
HCM Lane V/C Ratio	0.02	-	-	-	0.002	-	-	-				
HCM Control Delay (s)	9.8	0	-	-	7.5	0	-	0				
HCM Lane LOS	A	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-				

HCM 6th TWSC  
16: Driveway 5 & Edd Road

2023 Background Plus Site Generated  
Timing Plan: PM

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑↑	8	69	6	4
Traffic Vol, veh/h	107	11	8	69	6	4
Future Vol, veh/h	107	11	8	69	6	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	12	9	75	7	4
Major/Minor						
Major1		Major2		Minor1		
Conflicting Flow All	0	0	128	0	178	64
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	56	-
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	-	-	1456	-	795	987
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	960	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1456	-	790	987
Mov Cap-2 Maneuver	-	-	-	-	790	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	954	-
Approach						
EB		WB		NB		
HCM Control Delay, s	0		0.8		9.2	
HCM LOS			A			
Minor Lane/Major Mvmt						
NBLn1		EBT	EBR	WBL	WBT	
Capacity (veh/h)	859	-	-	1456	-	
HCM Lane V/C Ratio	0.013	-	-	0.006	-	
HCM Control Delay (s)	9.2	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	