

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
		<b>Totals:</b>	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	B (12.7)	B (14.7)
	EBT	A (0.2)	A (0.5)
	EBL	B (11.8)	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	A (9.4)	A (8.8)
	SBL	A (7.5)	A (7.4)
<u>Driveway 4 at</u>			
Edd Road	NBLR	B (12.0)	A (9.8)
	WBL	A (0.0)	A (7.5)
<u>Driveway 5 at</u>			
Edd Road	NBLR	B (10.6)	A (9.2)
	WBL	A (7.9)	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:
  - o Local Street: 20 feet
- Minimum Distance from Driveway to Intersection:
  - o 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	<b>No</b>
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.

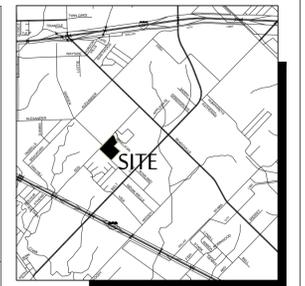
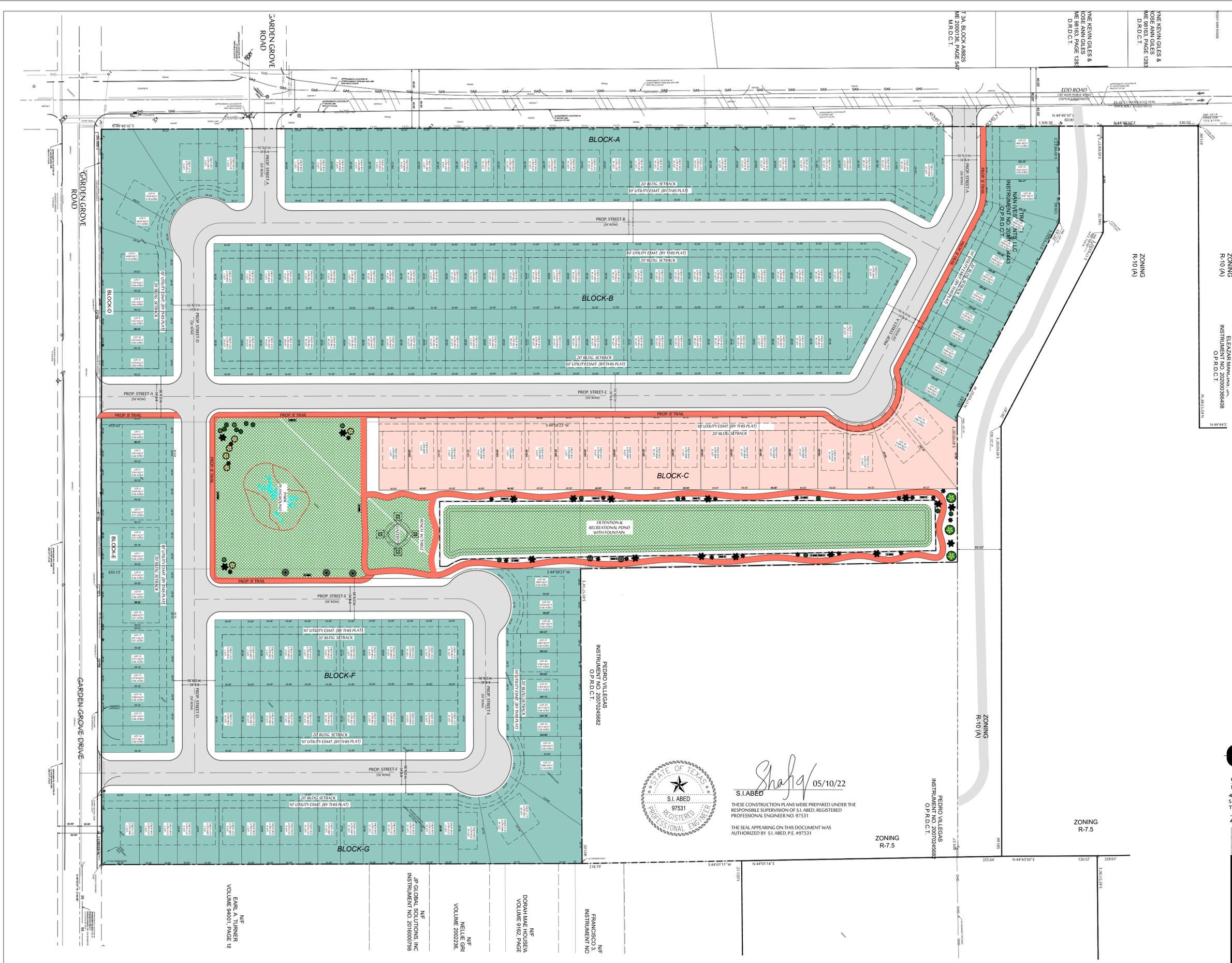
If you have additional comments regarding this project, please contact Mr. Onkar Dhondkar at 214-584-6521.

Sincerely,  
DESHAZO GROUP, INC.

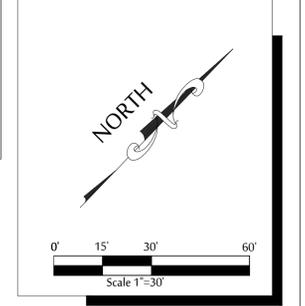
Steve Cherryholmes, P.E.  
Principal

***END OF MEMO***

# ***APPENDIX***



VICINITY MAP (N.T.S.)  
MAPSCO NO: 68-D



**LAND INFORMATION**

Existing Zoning	R 7.5
City Block	BLOCK-6045
Total Site Area	22.946 Ac (999,511 sq. ft.)
Lot Sizes	No. of Lots
Front Setback	Min. 20'(EXCEPT 10' AT EYE BROW)
Side Setback	5'-10'
Rear Setback	5'
PARK & POND	3.06 Ac(133,277 sq.ft.)
Preferred Elderly Living Ave. 4000 SQ.Ft.	19 Homes
TOWNHOMES 2340 SQ.Ft.MIN.	188 Homes
8' Trail	

PARK BENCH & TRASH CAN

**BENCHMARKS:**

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

2.BM#2-BENCHMARK IS AN X-CUT ON THE EAST EDGE OF THE SIDEWALK RUNNING ALONG THE WEST LINE OF THE PROPERTY AND IS LOCATED ACROSS FROM THE 1/2-INCH IRON ROD FOUND FOR THE SOUTHWEST CORNER OF THE PROPERTY. BENCHMARK IS 6-FEET W/SW OF SAID IRON. ELEV: 673.16'



*Shafiq* 05/10/22  
S.I. ABED  
THESE CONSTRUCTION PLANS WERE PREPARED UNDER THE RESPONSIBLE SUPERVISION OF S.I. ABED, REGISTERED PROFESSIONAL ENGINEER NO. 97531  
THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY S.I. ABED, P.E. #97531

**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-212-187

REV. NO.	DATE	DESCRIPTION	BY

DESIGN DEVELOPMENT CONSULTANTS, INC. DESIGN DEVELOPMENT CONSULTANTS, INC. TBPE FIRM REG. NO.# 10970  
 SD&C PID: XXXX CITY FILE NO.: S XXX-XXX  
**CONCEPTUAL SITE PLAN-PD FOR RESIDENTIAL USE**  
 1028 EDD ROAD, DALLAS, TX, 75233  
**DEPARTMENT OF PUBLIC WORKS**  
**CITY OF DALLAS, TEXAS**

DESIGN:	DRAWN	DATE	FILE	NUMBER	SHEET
S.I.ABED	S.A.	APRIL 2022	DPXXXX	XXXX	01

NIF EARL A. FRISBERG VOLUME 54001 PAGE 16

NIF J.P. GLOBAL SOLUTIONS, INC INSTRUMENT NO. 2018030798

NIF NELLIE GRI VOLUME 2002296

NIF DORAH HAE-HOSEN VOLUME 91851 PAGE 7

NIF FRANCISCO J. INSTRUMENT NO.

NIF PEDRO VILLEGAS INSTRUMENT NO. 20070245882 O.P.R.D.C.T.

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	Y		Y			Y
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
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	NBRWBLn1	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	Y	Y	Y	Y	Y	Y
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
Stage 1	-	-	-	-	683
Stage 2	-	-	-	-	265
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	553	-	-	-	330
Stage 1	-	-	-	-	376
Stage 2	-	-	-	-	693
Platoon blocked, %					
Mov Cap-1 Maneuver	553	-	-	-	311
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	↔		↕	↕		↕
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	Minor1	Major1	Major2		
Conflicting Flow All	289	79	0	0	158
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	WB	NB	SB
HCM Control Delay, s	9.4	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	832	1419
HCM Lane V/C Ratio	-	-	0.021	0.002
HCM Control Delay (s)	-	-	9.4	7.5
HCM Lane LOS	-	-	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	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕			↕			↕	
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									
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	Major1	Major2	Minor1	Minor2	
Conflicting Flow All	168	0	0	325	0
Stage 1	-	-	-	-	322
Stage 2	-	-	-	-	84
Critical Hdwy	4.14	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	6.54
Critical Hdwy Stg 2	-	-	-	-	6.54
Follow-up Hdwy	2.22	-	-	2.22	-
Pot Cap-1 Maneuver	1407	-	-	1231	-
Stage 1	-	-	-	-	529
Stage 2	-	-	-	-	664
Platoon blocked, %	-	-	-	-	915
Mov Cap-1 Maneuver	1407	-	-	1231	-
Mov Cap-2 Maneuver	-	-	-	-	529
Stage 1	-	-	-	-	664
Stage 2	-	-	-	-	915

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	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	Minor2	Minor3
Conflicting Flow All	0	0	317	0	399
Stage 1	-	-	-	-	316
Stage 2	-	-	-	-	83
Critical Hdwy	-	-	4.14	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	2.22	-	3.52
Pot Cap-1 Maneuver	-	-	1240	-	579
Stage 1	-	-	-	-	712
Stage 2	-	-	-	-	931
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1240	-	578
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	↕		↕↕			↕↕
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
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	NBRWBLn1	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	↕↕↕	↕↕↕	↕↕↕			↕
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
Stage 1	-	-	-	-	661
Stage 2	-	-	-	-	368
Critical Hdwy	5.34	-	-	-	5.74
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	6.04
Follow-up Hdwy	3.12	-	-	-	3.82
Pot Cap-1 Maneuver	564	-	-	-	300
Stage 1	-	-	-	-	387
Stage 2	-	-	-	-	614
Platoon blocked, %					
Mov Cap-1 Maneuver	564	-	-	-	255
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	↕		↕↔			↕↔
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	Minor1	Major1	Major2		
Conflicting Flow All	124	36	0	0	71
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	WB	NB	SB
HCM Control Delay, s	8.8	0	1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	955	1527
HCM Lane V/C Ratio	-	-	0.009	0.007
HCM Control Delay (s)	-	-	8.8	7.4
HCM Lane LOS	-	-	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	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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									
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	Major1	Major2	Minor1	Minor2	
Conflicting Flow All	87	0	0	156	0
Stage 1	-	-	-	-	142
Stage 2	-	-	-	-	48
Critical Hdwy	4.14	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	6.54
Critical Hdwy Stg 2	-	-	-	-	6.54
Follow-up Hdwy	2.22	-	-	2.22	-
Pot Cap-1 Maneuver	1507	-	-	1422	-
Stage 1	-	-	-	-	753
Stage 2	-	-	-	-	666
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1507	-	-	1422	-
Mov Cap-2 Maneuver	-	-	-	-	752
Stage 1	-	-	-	-	846
Stage 2	-	-	-	-	778

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	9.8	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
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	↑↓			↑↓	↑↓	
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	-