Traffic Impact Study
San Mateo Central Apartments

Draft Report

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Prepared for:

Equiterra Regenerative Design

Prepared By:

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EXECUTIVE SUMMARY

This report details the procedures and findings of a Traffic Impact Study (TIS) performed by Lee Engineering for Equiterra Regenerative Design. This report and the analyses contained herein were performed for a proposed mixed land use development at 5301 Central Ave in the city of Albuquerque (CABQ), NM. All analyses and items contained herein conform to scoping requirements set forth in a scoping call held in May 2021. Scoping forms are located in Appendix A.

BACKGROUND

The proposed development will convert an office building to mid-rise multifamily apartments to be located at 300 San Mateo near the intersection of Copper Ave. and San Mateo Blvd. within the CABQ, NM to be completed by 2022. A detailed site plan is included in Figure 2 of this report. Access to the site is to be taken directly from San Mateo Blvd. via two existing full access driveways and from Madeira Dr via three existing full access driveways. Study Intersections, as shown in Figure 1, include:

- Copper Ave/San Mateo Blvd
- Central Ave/San Mateo Blvd
- Madeira Dr/Copper Ave
- Madeira Dr/Central Ave
- San Mateo Blvd North Access
- San Mateo Blvd South Access
- Madeira Dr North Site Access
- Madeira Dr/Zia Rd East Site Access
- Madeira Dr South Site Access

9-hour turning movement counts were collected on May 18, 2021, for all study intersections. Data collected at San Mateo Blvd. and Central Ave. was used to determine an adjustment factor to account for reduced traffic volumes during the COVID-19 pandemic. Furthermore, using traffic data from San Mateo Blvd and Central Ave, growth rates were forecasted using Mid Regional Council of Government (MRCOG) projected travel demands for opening year and horizon year (10 years after projected build-out). Construction is anticipated to begin in 2021 with full completion of the Development in 2022. The development is to be constructed in a single phase.

Analysis scenarios for this study include:

1. Existing adjusted conditions (2021)
2. Background - No build (2022)
3. Full Build – 206 units built (2022)
4. Horizon Year (2032)

SUMMARY OF RECOMMENDATIONS

As included at the end of this report, final recommendations are summarized as follows:

- San Mateo Blvd & Copper Ave: It is recommended that the signal be re-timed upon opening of the full development to better accommodate shifting traffic patterns.
- San Mateo Blvd & Central Ave: It is recommended that the signal be re-timed upon opening of the full development to better accommodate shifting traffic patterns.
- San Mateo Blvd and North Driveway
    - It is recommended that a right turn auxiliary lane be constructed. Recommended lengths can be found in the body of this report.
- San Mateo Blvd and South Driveway

- It is recommended that a right turn auxiliary lane be constructed. Recommended lengths can be found in the body of this report.

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INTRODUCTION

This report details the procedures and findings of a Traffic Impact Study (TIS) performed by Lee Engineering for Equiterra Regenerative Design. This report and the analyses contained herein were performed for proposed development conversion of an office building to a 125 unit mid-rise multifamily apartments and the construction of three 2.2 ksf quick services restaurants at 5301 Central Ave in CABQ, NM.

The scope of this report and the analyses performed were completed in agreement with the scoping requirements outlined with the CABQ. Scoping Forms from the scoping call held in May 2021, are included in Appendix A. Analysis procedures, conclusions, and recommendations for this study were developed according to the *ITE Trip Generation Manual 10th Edition, and Highway Capacity Manual 6th Edition*.

Construction is anticipated to begin in 2021 with full completion of the development in 2022. The development is to be constructed in one single phases.

Analysis procedures included in this report were performed for the following scenarios:

1. Existing adjusted conditions (2021)
2. Background – No build (2022)
3. Full Build – Complete Construction (2022)
4. Horizon Year (2032)

PROJECT LOCATION & SITE PLAN

The proposed housing development of 125 units is to be converted from an existing office building. The mid-rise multifamily apartments are to be located on the northwest side of CABQ at 300 San Mateo. Three 2.2 ksf fast-food restaurants will also be constructed at this location. Surrounding major intersections include Central Ave. and Copper Ave along San Mateo Blvd. The project area is bounded by existing development. North of the study area are restaurants, major retail shops, and residential neighborhoods along Copper Ave. South of the site are several restaurants, commercial and retail developments along Central Ave. Figure 1 shows study intersections, and the surrounding area. Figure 2 shows the proposed site plan.

SITE ACCESS

Access to the site is available directly off San Mateo Blvd. via two existing right-in, right-out driveways. Currently, there are three existing full access driveways off Madeira Dr giving access to the development. Review of compliance with the *2020 City of Albuquerque Development Process Manual (DPM)* at proposed access points were conducted, as well as driveway access. Details of the driveway's location and access are included in subsequent sections of this report.

Figure 1: Vicinity Map

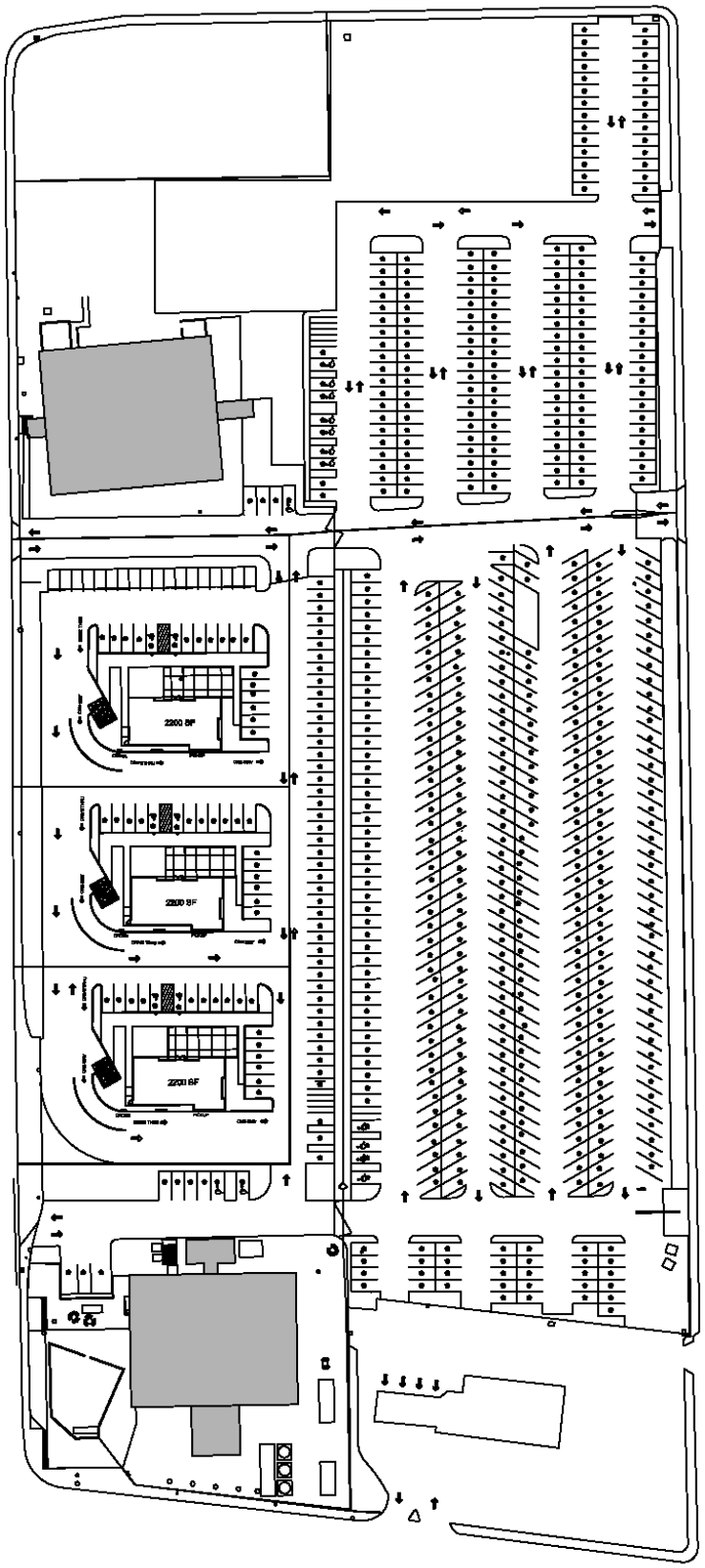

Figure 2. Site Plan

Study Area, Area Land Use, and Streets

STUDY AREA

The study area is defined as the area bounded by San Mateo Blvd. and Madeira Dr., between Copper Ave. and Central Ave. The following intersections and access driveways were identified and agreed upon in the scoping meeting, and will serve as the study intersections for this report:

- Copper Ave/San Mateo Blvd
- Central Ave/San Mateo Blvd
- Madeira Dr/Copper Ave
- Madeira Dr/Central Ave
- San Mateo Blvd North Access
- San Mateo Blvd South Access
- Madeira Dr North Site Access
- Madeira Dr/Zia Rd East Site Access
- Madeira Dr South Access

AREA LAND USE

As described, the proposed mid-rise multifamily apartments and three quick services restaurants are to be located on Central Ave north of the San Mateo intersection. Surrounding major intersections include Central Ave. and San Mateo Blvd, as well as Copper Ave. and San Mateo Blvd. Adjacent to and surrounding the project site are land uses consisting of the following:

- Commercial: A majority of the surrounding land use is commercial in nature, with commercial developments located immediately south and west of the site and throughout the Central Ave. corridor. These developments include a Walmart Supercenter and a Walgreens.
- Hospitality and Service: Several hotels exist along the study area corridors exist, as well as a handful of restaurants.
- Residential: North and east of the study area lies existing residential developments.

STREETS

The following details the characteristics and features of streets included in the study area:

San Mateo Blvd is a three-lane median divided roadway, currently classified by MRCOG as a principal arterial and runs north and south. Travel lanes are approximately 12 feet wide. The roadway incorporates curb, gutter, and sidewalk is present on both sides of the road. There are bus stops present throughout the roadway. The roadway has a posted speed limit of 40 MPH.

Central Ave is a three-lane median divided roadway, currently classified by MRCOG as a principal arterial and runs east and west. Travel lanes are approximately 12 feet wide. The roadway incorporates curb, gutter, and sidewalk is present on both sides of the road. There is a dedicated bus lane present in the inner-left lane in both directions throughout the roadway with a bus stop located in the middle of the roadway. The roadway has a posted speed limit of 35 MPH.

Copper Ave is a two-lane undivided roadway, currently classified by MRCOG as a major collector and runs east and west. Travel lanes are approximately 12 feet wide. The roadway incorporates curb, gutter, and sidewalk is present on both sides of the road. There are bikeway markings and signs along the roadway. The roadway has a posted speed limit of 18 MPH.

Madeira Dr is a two-lane undivided roadway classified by CABQ DPM Roadway Functional Classifications Descriptions (Table 7.3.33) as a local road and runs north and south. The roadway incorporates curb, gutter, and sidewalk is present on both sides of the road. Travel lanes are approximately 14 feet wide. The roadway is assumed to have a speed limit of 30 MPH.

INTERSECTIONS

The following details the traffic control and characteristics of existing intersections in the study area:

San Mateo Blvd & Central Ave is a 4-legged signalized-controlled intersection maintained by the City of Albuquerque. The signal operates with time-of-day coordination. Pedestrian crosswalks exist at all approaches of the intersection. Crosswalk striping was observed to be faded and discolored.

San Mateo Blvd & Copper Ave is a 4-legged signalized-controlled intersection maintained by the City of Albuquerque. The signal operates with time-of-day coordination. Pedestrian crosswalks exist at all approaches of the intersection except for the northbound approach. Crosswalk striping was observed to be faded and discolored.

Madeira Dr & Copper Ave is a three-legged unsignalized two way stop-controlled intersection maintained by the City of Albuquerque. The northbound and southbound approaches must yield to oncoming perpendicular traffic. The southbound approach can only turn right onto Copper Ave. Crosswalks were observed to be unmarked.

Madeira Dr & Central Ave is a three-legged unsignalized two way stop-controlled intersection maintained by the City of Albuquerque. The southbound approach must yield to oncoming perpendicular traffic. The southbound approach can only turn right onto Copper Ave. Pedestrian crosswalk exist at the southbound approach. Crosswalk striping was observed to be marked.

TRANSIT

Currently, bus routes are present in the study area. Route 140 and 141 operates everyday with stops every 30 minutes north and south directions on San Mateo Blvd. Route 140 and 141 has two stops in each direction of roadway between Central Ave. and Copper Ave. Route 66 operates everyday with stops every 15 minutes east and west directions on Central Ave. Route 66 has two stops located on the east side of the street. The Albuquerque Rapid Transit (ART) has a center platform station located in the middle of the roadway, with a dedicated bus lane servicing both sides of the street. The ART operates on both the 766 Red line and the 777 Green line every 8-15 minutes.

MULTIMODAL CONNECTIVITY

Currently, there are bicycle facilities present immediately near the development on Copper Ave. Sidewalks exists on both sides of all streets in compliance with CABQ DPM within the study area.

CURRENT ADJACENT PROJECTS

As discussed in the scoping meeting, no known adjacent developments are present in the area.

ANALYSIS OF EXISTING CONDITIONS

DATA COLLECTION

Turning movement counts for the study intersections at Copper Ave/San Mateo Blvd, Central Ave/San Mateo Blvd, Madeira Dr/Copper Ave, Madeira Dr/Central Ave, San Mateo Blvd North Access, San Mateo Blvd South Access, Madeira Dr/Zia Rd East Site Access, and Madeira Dr South Access were collected for 9 hours in 3-periods: 6:00 AM-9:00 AM (morning), 11:00 AM-2:00 PM (mid-day), and 3:00 PM-6:00 PM (evening) on May 18, 2021. Traffic data from a 2016 Congestion Management Study at San Mateo and Central Ave was used to establish a COVID-19 adjustment factor, as necessary. The 2016 turning movement counts provided by the city were forecasted to current year (2021) using data from MRCOG projected travel demand growth rates (see growth rate section for rates & details) prior to comparison to current year (2021) traffic counts. Newly collected traffic data at San Mateo Blvd & Central Ave, in coordination with adjusted 2018 Lomas Car Wash Study traffic data, determined an adjustment factor was needed to account for reduced traffic volumes during the COVID-19 pandemic. This factor was determined for the AM peak hour and applied to all study

intersections. Table 1 below shows the peak hours for each intersection used in the analysis. Adjusted turning movement counts, lane geometry, and traffic control for the study intersections are presented in Figure 3. Full turning movement count output sheets can be found in Appendix B.

Table 1: Intersection Peak Hours

Intersection	Data Collection Date	AM Peak Hour	PM Peak Hour
Copper Ave/San Mateo Blvd	5/18/2021	7:30-8:30 AM	3:45-4:45 PM
Central Ave/San Mateo Blvd	5/18/2021		
Madeira Dr/Copper Ave	5/20/2021		
Madeira Dr/Central Ave	5/20/2021		
San Mateo Blvd North Access	5/20/2021		
San Mateo Blvd South Access	5/20/2021		
Madeira Dr/Zia Rd East Site Access	5/20/2021		
Madeira Dr South Access	5/20/2021		

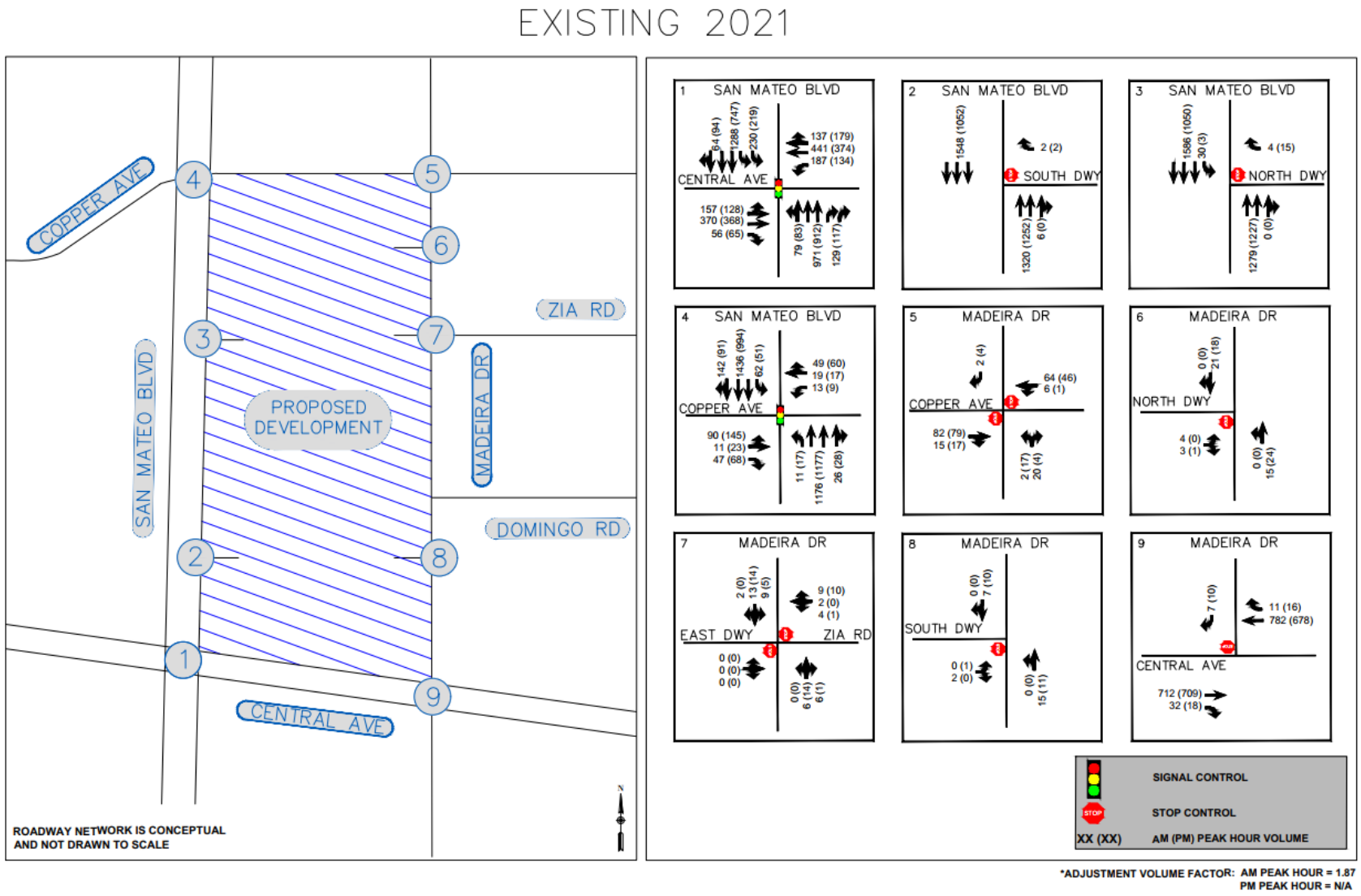

Figure 3. Existing (Adjusted) 2021 Turning Movement Counts

Level of Service and Capacity Analysis

Intersection Analysis

Intersection Capacity and Level of Service (LOS) analysis were performed according to the methods and procedures provided in the *Highway Capacity Manual, 6th Edition (HCM6).* Highway Capacity software was used to facilitate the analysis. Per the Highway Capacity Manual, LOS is presented as a letter grade (A through F) based on the calculated average delay for an intersection or movement. Delay is calculated as a function of several variables, including signal phasing operations, cycle length, traffic volumes, and opposing traffic volumes, but is a measurement of the average wait time a driver can expect when moving through an intersection. Factors such as total cycle time (for all movements), queueing restrictions, and vehicle volumes can affect measurements of delay, especially for lower volume movements and side streets. Generally, these factors are only realized when delays reach or exceed LOS E thresholds. In such cases, a narrative is offered in subsequent sections specific to the individual movement in question.

Table 2 below, reproduced from the Highway Capacity Manual, shows delay thresholds and the associated Level of Service assigned to delay ranges. Generally, a LOS of D or better is considered an acceptable level of service.

Table 2: LOS Criteria and Descriptions for Signalized Intersections

Level of Service	Average Control Delay (sec/vehicle)	General Description (Signalized Intersections)
A	≤10	Free flow
B	>10 – 20	Stable flow (slight delays)
C	>10 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Unsignalized intersection LOS is divided into two intersection types: all-way stop-controlled and two-way stop-controlled. All-way stop-controlled intersection LOS is expressed in terms of average vehicle delay of all the movements. Two-way stop-controlled intersection LOS is defined in terms of average vehicle delay of an individual movement. Table 3 shows LOS criteria for unsignalized intersections.

Table 3: LOS Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

Based on procedures outlined in the Highway Capacity Manual, intersection delay and LOS for study intersections are reported as the delay and level of service for the worst-case movement. Per HCM6 procedures, peak hour factors obtained from collected traffic counts for the intersections were used in the existing conditions analysis and all other scenarios. Queues are reported for queue measurements falling within the 95th percentile. It should be noted that 95th percentile queues are statistically expected to occur during only 5% of the peak hour's sign cycles. It is also noted that un-reported average queueing at an intersection would statistically be much shorter than 95th percentile queueing.

Analysis of Signalized Intersections

Table 4 below summarizes intersection capacity and LOS analysis performed for existing conditions for the signalized intersection at San Mateo Blvd & Central Ave, and San Mateo Blvd & Copper Ave. Per HCM6 procedures, peak hour factors obtained from collected traffic counts for the intersections were used in the existing conditions analysis and all other scenarios. Existing signal timings for signalized intersections provided by CABQ were used in each analysis scenario, unless otherwise stated. Queueing is reported as a ratio Que Storage Ratio (QSR) for signalized intersections and indicates the ratio of demand to capacity based on possible lengths of waiting vehicles during "red" times for specific movements. Table 5 below summarizes queuing results. Detailed capacity output sheets can be found in Appendix D.

Table 4: 2021 Existing Signalized Capacity Analysis Summary

San Mateo Blvd & Copper Ave					
2021 AM Existing			2021 PM Existing		
Time-Period	Delay	LOS	Time-Period	Delay	LOS
7:30	16.7	B	3:45	17.0	B
7:45	17.2	B	4:00	17.7	B
8:00	16.2	B	4:15	16.9	B
8:15	15.6	B	4:30	17.0	B
San Mateo Blvd & Central Ave					
2021 AM Existing			2021 PM Existing		
Time-Period	Delay	LOS	Time-Period	Delay	LOS
7:30	39.4	D	3:45	39.1	D
7:45	46.3	D	4:00	40.0	D
8:00	37.5	D	4:15	38.7	D
8:15	36.0	D	4:30	38.6	D

From the table above, the following is summarized:

San Mateo Blvd & Copper Ave

- Capacity Analysis:
    - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours.

San Mateo Blvd & Central Ave

- Capacity Analysis:
    - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours.

Table 5: 2021 AM Existing Signalized Queue Storage Summary

San Mateo Blvd & Copper Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	26.5	23.4	24.1	-	24.1	24.5	24.6	14.9	15.6	21.3	16.5	16.9
7:45	25.4	23.5	24.7	-	23.8	24.5	26.3	15.4	16.1	23.0	17.1	17.7
8:00	27.2	23.5	24.1	-	24.0	23.6	22.8	14.3	14.8	20.4	15.8	16.1
8:15	26.2	23.4	23.7	-	23.6	24.5	19.4	14.4	14.9	20.5	14.2	14.4
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	0.1	0.0	0.1	-	0.08	0.10	0.05	0.41	0.4	0.2	0.56	0.6
7:45	0.1	0.0	0.1	-	0.05	0.10	0.05	0.44	0.4	0.2	0.60	0.6
8:00	0.2	0.0	0.1	-	0.07	0.03	0.04	0.35	0.4	0.3	0.52	0.5
8:15	0.2	0.0	0.0	-	0.01	0.10	0.09	0.36	0.4	0.2	0.38	0.4
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	C	C	C	-	C	C	C	B	B	C	B	B
7:45	C	C	C	-	C	C	C	B	B	C	B	B
8:00	C	C	C	-	C	C	C	B	B	C	B	B
8:15	C	C	C	-	C	C	B	B	B	C	B	B
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL	EBT	EBR (44')	WBL	WBT	WBR (40')	NBL (160')	NBT	NBR	SBL (150')	SBT	SBR
7:30	-	-	0.76	-	-	1.21	0.05	-	-	0.27	-	-
7:45	-	-	1.35	-	-	1.21	0.05	-	-	0.28	-	-
8:00	-	-	0.76	-	-	0.32	0.04	-	-	0.39	-	-
8:15	-	-	0.41	-	-	1.21	0.12	-	-	0.35	-	-
San Mateo Blvd & Central Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	59.0	30.1	30.2	71.6	29.5	29.8	55.8	36.2	37.8	53.9	36.0	38.5
7:45	109.3	36.5	36.9	109.3	36.6	37.1	56.6	35.9	37.9	57.8	38.3	43.8
8:00	60.6	25.7	25.8	57.5	30.6	30.9	56.3	38.2	39.7	57.0	33.1	34
8:15	66.2	26.1	26.2	57.7	23.3	23.6	55.6	37.9	40.2	53.9	33.4	34.2
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	0.83	0.26	0.26	0.89	0.44	0.44	0.63	0.70	0.70	0.74	0.77	0.77
7:45	1.01	0.54	0.54	1.01	0.54	0.55	0.60	0.70	0.70	0.80	0.86	0.86
8:00	0.85	0.31	0.31	0.81	0.47	0.48	0.43	0.68	0.69	0.79	0.67	0.67
8:15	0.77	0.30	0.31	0.82	0.37	0.38	0.64	0.73	0.74	0.75	0.63	0.63
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	E	C	C	E	C	C	E	D	D	D	D	D
7:45	F	D	D	F	D	D	E	D	D	E	D	D
8:00	E	C	C	E	C	C	E	D	D	E	C	C
8:15	E	C	C	E	C	C	E	D	D	D	C	C
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL (120')	EBT	EBR	WBL (280')	WBT	WBR	NBL (200')	NBT	NBR	SBL (300')	SBT	SBR
7:30	1.68	-	-	1.14	-	-	0.31	-	-	0.42	-	-
7:45	3.26	-	-	1.40	-	-	0.25	-	-	0.60	-	-
8:00	2.08	-	-	0.70	-	-	0.12	-	-	0.57	-	-
8:15	0.74	-	-	0.69	-	-	0.34	-	-	0.42	-	-

Table 6: 2021 PM Existing Signalized Queue Storage Summary – PM

San Mateo Blvd & Copper Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	29.9	25.5	26.3	-	-	26.3	20.5	15.4	16.0	20.6	15.3	15.5
4:00	31.9	25.2	27.9	-	25.5	26.4	19.7	15.8	16.4	23.1	14.6	14.8
4:15	29.0	25.6	25.8	-	25.9	26.5	18.4	16.0	16.6	22.7	14.8	14.9
4:30	29.2	25.4	26.1	-	25.2	26.8	19.0	15.8	16.4	22.3	14.9	15
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	0.27	0.04	0.10	-	0.00	0.10	0.06	0.36	0.36	0.14	0.39	0.39
4:00	0.36	0.02	0.21	-	0.05	0.10	0.11	0.39	0.39	0.25	0.33	0.33
4:15	0.18	0.05	0.06	-	0.07	0.11	0.01	0.41	0.41	0.20	0.34	0.35
4:30	0.26	0.03	0.09	-	0.01	0.13	0.04	0.39	0.39	0.20	0.35	0.35
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	C	C	C	-	-	C	C	B	B	C	B	B
4:00	C	C	C	-	C	C	B	B	B	C	B	B
4:15	C	C	C	-	C	C	B	B	B	C	B	B
4:30	C	C	C	-	C	C	B	B	B	C	B	B
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL	EBT	EBR (44')	WBL	WBT	WBR (40')	NBL (160')	NBT	NBR	SBL (150')	SBT	SBR
3:45	-	-	1.15	-	-	1.15	0.08	-	-	0.21	-	-
4:00	-	-	2.53	-	-	1.22	0.18	-	-	0.37	-	-
4:15	-	-	0.69	-	-	1.32	0.02	-	-	0.27	-	-
4:30	-	-	1.01	-	-	1.60	0.06	-	-	0.29	-	-
San Mateo Blvd & Central Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	63.2	23.7	23.9	62.9	24.8	25.1	60.5	42.1	43.2	58.6	37.9	38.6
4:00	62.4	25.9	26.1	61.6	27.4	27.8	60.9	42.8	44.5	58.2	34.9	35.4
4:15	62.7	24.9	25.0	62.5	25.0	25.3	61.9	42.3	43.8	58.6	35.2	35.6
4:30	63.8	26.1	26.2	63.8	27.9	28.2	61.9	41.7	43.8	58.0	32.7	33.1
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	0.80	0.28	0.29	0.81	0.36	0.37	0.65	0.70	0.71	0.75	0.58	0.59
4:00	0.82	0.27	0.27	0.83	0.40	0.41	0.63	0.73	0.73	0.79	0.48	0.49
4:15	0.81	0.31	0.32	0.81	0.33	0.34	0.59	0.73	0.73	0.75	0.48	0.49
4:30	0.80	0.30	0.30	0.80	0.40	0.41	0.59	0.75	0.75	0.78	0.49	0.49
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	E	C	C	E	C	C	E	D	D	E	D	D
4:00	E	C	C	E	C	C	E	D	D	E	C	D
4:15	E	C	C	E	C	C	E	D	D	E	D	D
4:30	E	C	C	E	C	C	E	D	D	E	C	C
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL (120')	EBT	EBR	WBL (280')	WBT	WBR	NBL (200')	NBT	NBR	SBL (300')	SBT	SBR
3:45	1.54	-	-	0.7	-	-	0.4	-	-	0.5	-	-
4:00	1.70	-	-	0.8	-	-	0.3	-	-	0.6	-	-
4:15	1.63	-	-	0.7	-	-	0.3	-	-	0.5	-	-
4:30	1.45	-	-	0.6	-	-	0.3	-	-	0.5	-	-

From the tables above, the following is summarized:

San Mateo Blvd & Copper Ave

- Capacity Analysis:
    - Under existing conditions, 95th percentile Queue Storage Ratio (QSR) at the intersection is observed to exceed existing storage capacities in the AM for the eastbound right movement, which show a QSR greater than 1 for one multi-peak period, and the westbound right movement, which show a QSR greater than 1 for three multi-peak periods. Queue Storage Ratio (QSR) is observed to exceed existing storage capacities in the PM for the eastbound right movement, which show a QSR greater than 1 for three multi-peak period, and the westbound right movement, which show a QSR greater than 1 for 4 multi-peak periods. It is noted that the v/c ratios for these movements do not indicate that the movements exceed capacity.

San Mateo Blvd & Central Ave

- Queueing Analysis:
    - Under existing conditions, 95th percentile Queue Storage Ratio (QSR) at the intersection is observed to exceed existing storage capacities in the AM for the eastbound left movement, which show a QSR greater than 1 for three multi-peak periods, and the westbound left movement, which show a QSR greater than 1 for two multi-peak periods. Queue Storage Ratio (QSR) is observed to exceed existing storage capacities in the PM for the eastbound left movement, which show a QSR greater than 1 for 4 multi-peak periods.

Analysis of Stop Controlled Intersections

Table 7 below summarizes stop-controlled intersection capacity, LOS analysis, and queuing results performed for existing conditions for the unsignalized intersections. Queueing is reported as number of vehicles in the queue for stop-controlled intersections. Detailed capacity output sheets can be found in Appendix D.

Table 7: 2021 Existing Stop Control Capacity Analysis & Queue Storage Summary

Madeira Dr & Copper Ave								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBL	0.00	7.4	A	0.00	0.00	7.4	A	0.00
NBT	0.02	8.9	A	0.01	0.03	9.5	A	0.01
SBR	0.00	8.6	A	0.00	0.00	8.6	A	0.00
Madeira Dr & Central Ave								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
SBR	0.01	11.0	B	0.00	0.02	10.4	B	0.00
Madeira Dr & North Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.01	8.6	A	0.00	0.00	8.4	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.3	A	0.00
Madeira Dr & Zia Rd								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBT	0.02	8.9	A	0.10	0.01	8.5	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.3	A	0.00
SBL	0.01	4.3	A	0.00	0.00	7.3	A	0.00
Madeira Dr & South Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.00	8.4	A	0.00	0.00	8.6	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.2	A	0.00
San Mateo Blvd & North Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBR	0.02	17.3	C	0.00	0.04	15.3	C	0.10
SBL	0.16	24.8	C	0.60	0.01	17.3	C	0.00
San Mateo Blvd & South Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBR	0.01	17.7	C	0.00	0.01	15.7	C	0.00

From the table above, the following is summarized:

Madeira Dr and Copper Ave

- Capacity Analysis:
  - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under existing conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and Central Ave

- Capacity Analysis:
  - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under existing conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and North Site Access

- Capacity Analysis:
  - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under existing conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and Zia Rd/East Site Access

- Capacity Analysis:
  - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under existing conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and South Driveway

- Capacity Analysis:
  - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under existing conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

San Mateo Blvd and North Driveway

- Capacity Analysis:
    - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
    - Under existing conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

San Mateo Blvd and South Driveway

- Capacity Analysis:
    - Under existing conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
    - Under existing conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

ANALYSIS OF FUTURE CONDITIONS

The following sections detail the methods and calculations used to obtain traffic volumes for each analysis scenario. This process used the following tools as described below: Traffic Projections, and Site Trip Distributions & Assignment. Figures at the end of this section show the resulting traffic volumes determined for each analysis scenario.

TRAFFIC PROJECTIONS

Construction is anticipated to begin in 2021, with full completion of the development in 2022. To forecast existing traffic volumes to future analysis background conditions, loading values from the 2016 & 2040 (updated) travel demand models were provided by MRCOG. These models were then compared, using AM and PM peak hour directional volumes (AMPH LOAD & PMPH LOAD), to calculate anticipated growth rates for individual roadways. To facilitate a conservative analysis, roadways calculated to have a yearly growth rate of less than 1% were analyzed with a 1% per year growth rate. Growth rates were then converted to growth factors for the specific analysis scenarios. Growth factors used in the analysis are shown in Table 8. Values provided by MRCOG are reproduced verbatim below. Growth factors were then applied to the 2021 adjusted conditions turning movement volumes to forecast future volumes.

Table 8: Growth Rate Method

Roadway			MRCOG 2016 Model "Peak Hour Load"	MRCOG 2040 Model "Peak Hour Load"	Yearly Growth Rate	Average Yearly Growth	Growth Rate for Analysis
San Mateo Blvd Northbound	AM	PH	725	1081	1.68%	0.58%	1.00%
	PM	PH	1340	1754	1.13%		
San Mateo Blvd Southbound	AM	PH	1031	1462	1.47%		
	PM	PH	883	1212	1.33%		
Central Ave Eastbound	AM	PH	264	313	0.71%		
	PM	PH	793	722	-0.39%		
Central Ave Westbound	AM	PH	721	545	-1.16%		
	PM	PH	509	490	-0.16%		

TRIP GENERATION

Trip generation for the development was performed using the procedures and methodologies provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. The land use category Fast Food Restaurant with Drive-Through Window (ITE 934) was used to generate trips for the development. Trips were calculated using rates for daily, AM peak hour, and PM peak hour generators. As previously stated, the development is to consist of one single phase. Total development trips and trips generated are shown below in the tables. Site trips for the Development site were generated using data and procedures according to the Institute of Transportation Engineer's Trip Generation Manual. Due to the nature of this development, pass-by trips were calculated per the ITE Trip Generation Manual 10th Edition and assigned to new project trips. The net site generated trips (gross trips generated minus pass-by trips), shown as primary trips, were added to background traffic volumes to create the build-out traffic volumes.

Tables below show expected unadjusted trips, pass-by trips, and primary trips generated by the development.

Table 9: Development Trip Generation

Use	Units		TRIP GENERATION							PEAK HOUR TRIPS			
			Weekday	AM Peak			PM Peak			AM Peak		PM Peak	
			Trips	Total	Enter	Exit	Total	Enter	Exit	In	Out	In	Out
ITE 221 - Multifamily Housing (Mid-Rise)	125	Dwelling Units	680	42	27%	73%	52	60%	40%	11	31	31	21
Use	**Units**		**TRIP GENERATION**							**PEAK HOUR TRIPS**			
			Weekday	**AM Peak**			**PM Peak**			**AM Peak**		**PM Peak**	
			Trips	**Rate**	**Enter**	**Exit**	**Rate**	**Enter**	**Exit**	**In**	**Out**	**In**	**Out**
ITE 934 - Fast Food Restaurant with Drive-Through Window	6.6	1000 Sq. Ft GFA	3108	50.97	52%	48%	51.36	51%	49%	175	162	173	168
		Total Trips								186	193	204	189

Table 10: Net Development Trip Generation

Site Trips Generation for Entire Development			PEAK HOUR TRIPS			
			AM Peak		PM Peak	
			In	Out	In	Out
Total Trips			186	193	204	189
Pass-By/Diverted Trips						
Use	**Rates**		**AM Peak**		**PM Peak**	
	AM Peak	**PM Peak**	**In**	**Out**	**In**	**Out**
934 - Fast-Food Restaurant with Drive-Through Window	49%	50%	86	86	87	87
Total Pass-by Trips			86	86	87	87
Direct Trips			100	107	117	102

TRIP DISTRIBUTION AND ASSIGNMENT

Trip Distribution was determined based on the analysis of existing intersection demand characteristics within the study area. Overall, trips were distributed within the roadway network to and from the development based on the proportions of existing turning movement counts/demands. Trip routing was based on logical trip attractions and destinations for commercial based trips. The figures below show the trip distribution and assignment for the development of each analysis scenario. Trips were then assigned to the background roadway networks to create build-out volumes and are shown in figures below.

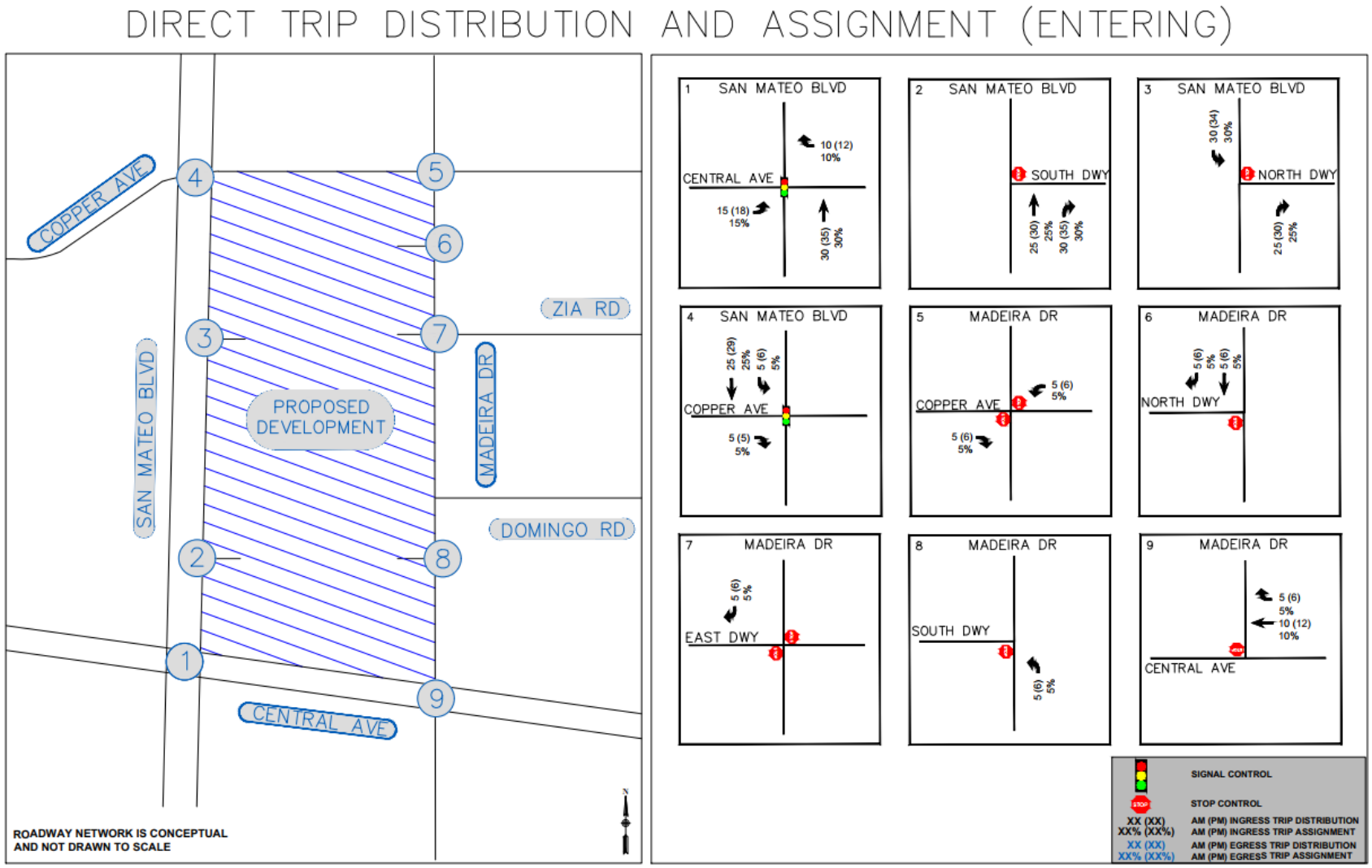

Figure 4. Direct Trips Distribution and Assignment (Entering)

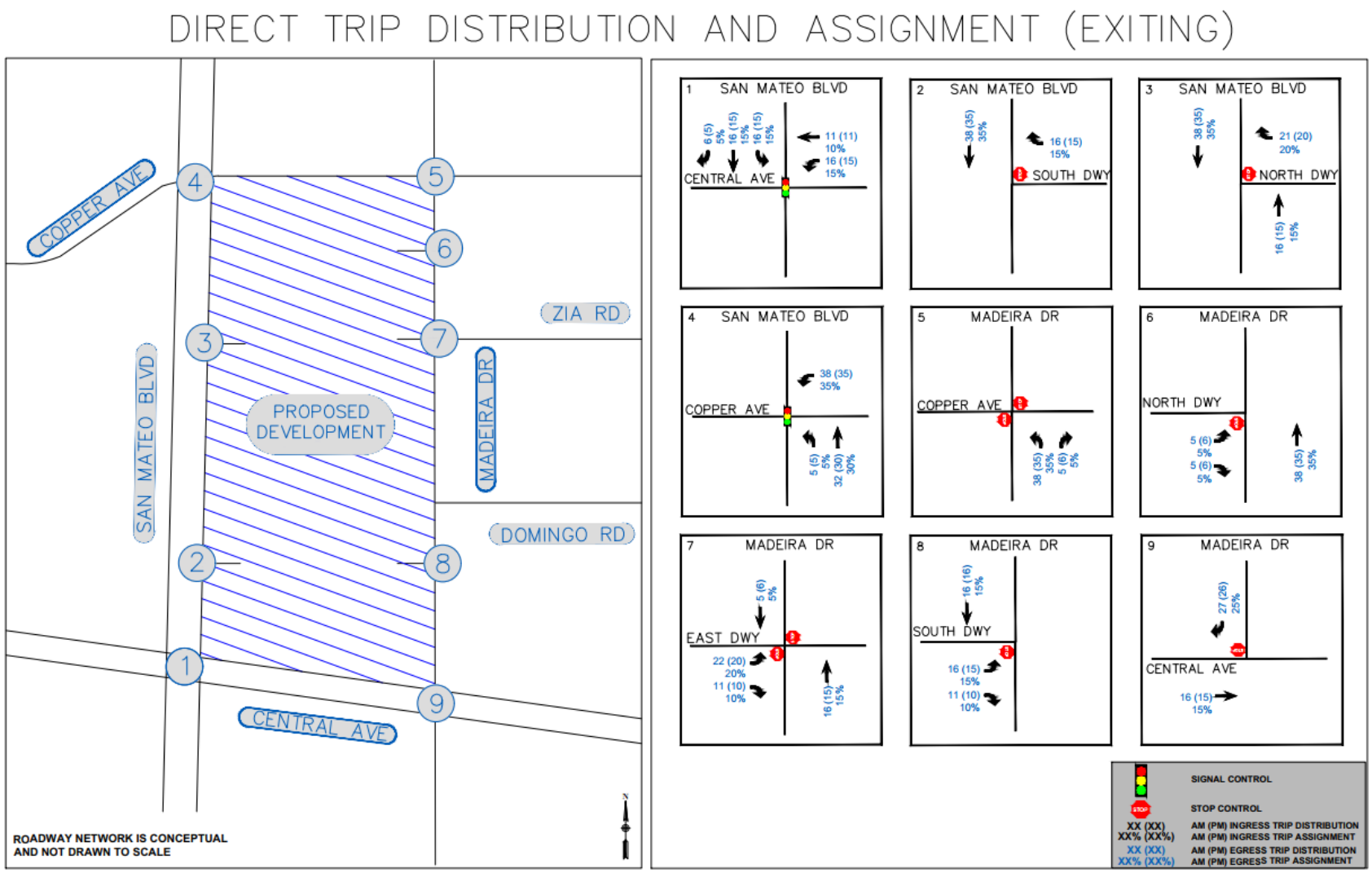

Figure 5. Direct Trips Distribution and Assignment (Exiting)

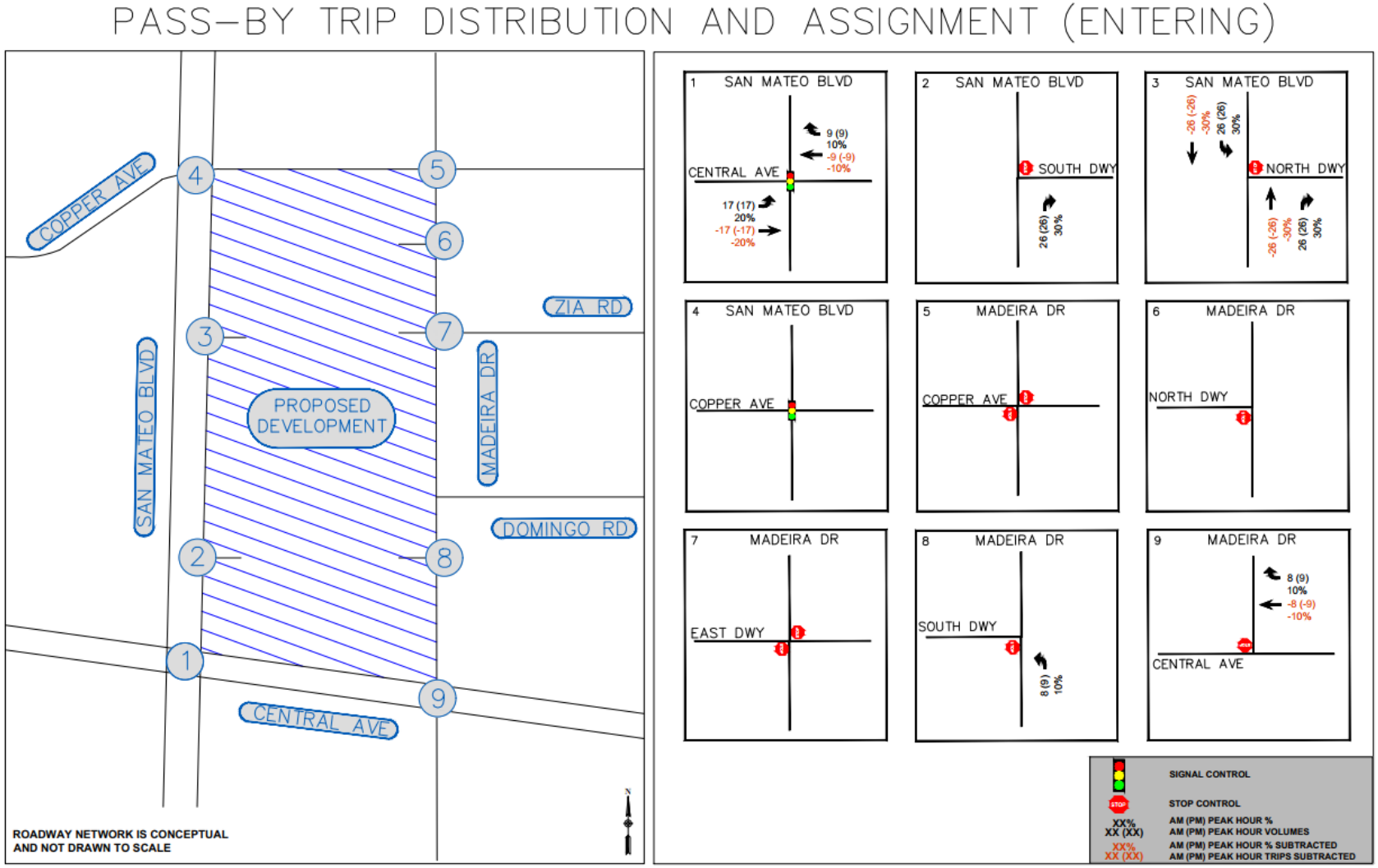

Figure 6. Pass-by Trips Distribution and Assignment (Entering)

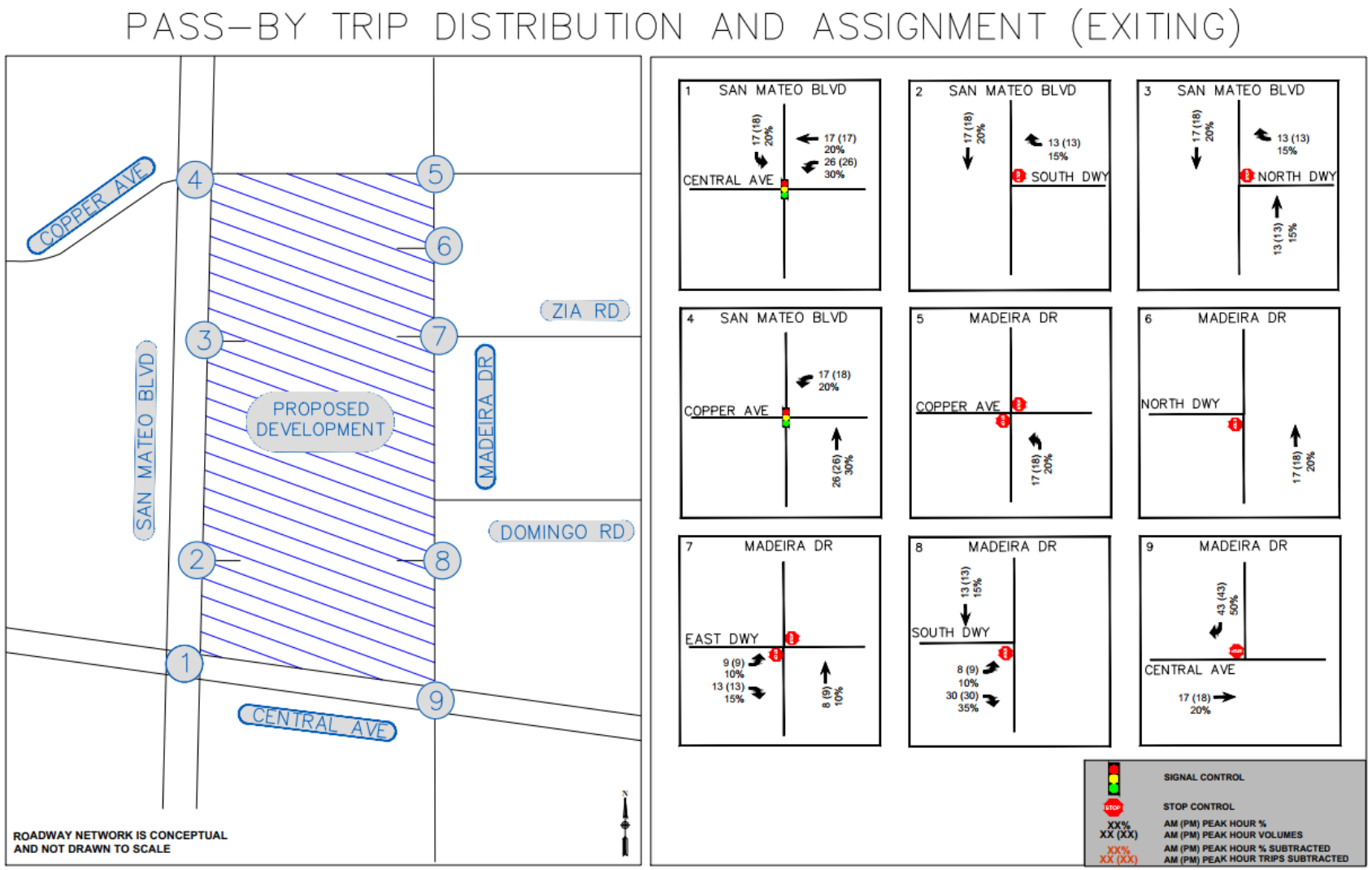

Figure 7. Pass-by Trips Distribution and Assignment (Exiting)

Traffic Volume Calculations

Traffic volumes used in the analysis were calculated based on the following:

1. Existing Conditions: direct turning movement counts from 2021
2. Background 2022: 2022 growth rate applied to existing conditions
3. Full Build-out 2022: Background 2022 traffic volumes plus site trips
4. Horizon Year 2032: 2032 growth rate plus site trips

As stated above, build-out traffic volumes were calculated using the growth rates and factors detailed in previous sections plus site trips from the preceding analysis year. Site trips were added to study intersections with direct access to the proposed development. Figure 8**Error! Reference source not found.** through Figure 10 show the traffic volumes used for each individual analysis scenario.

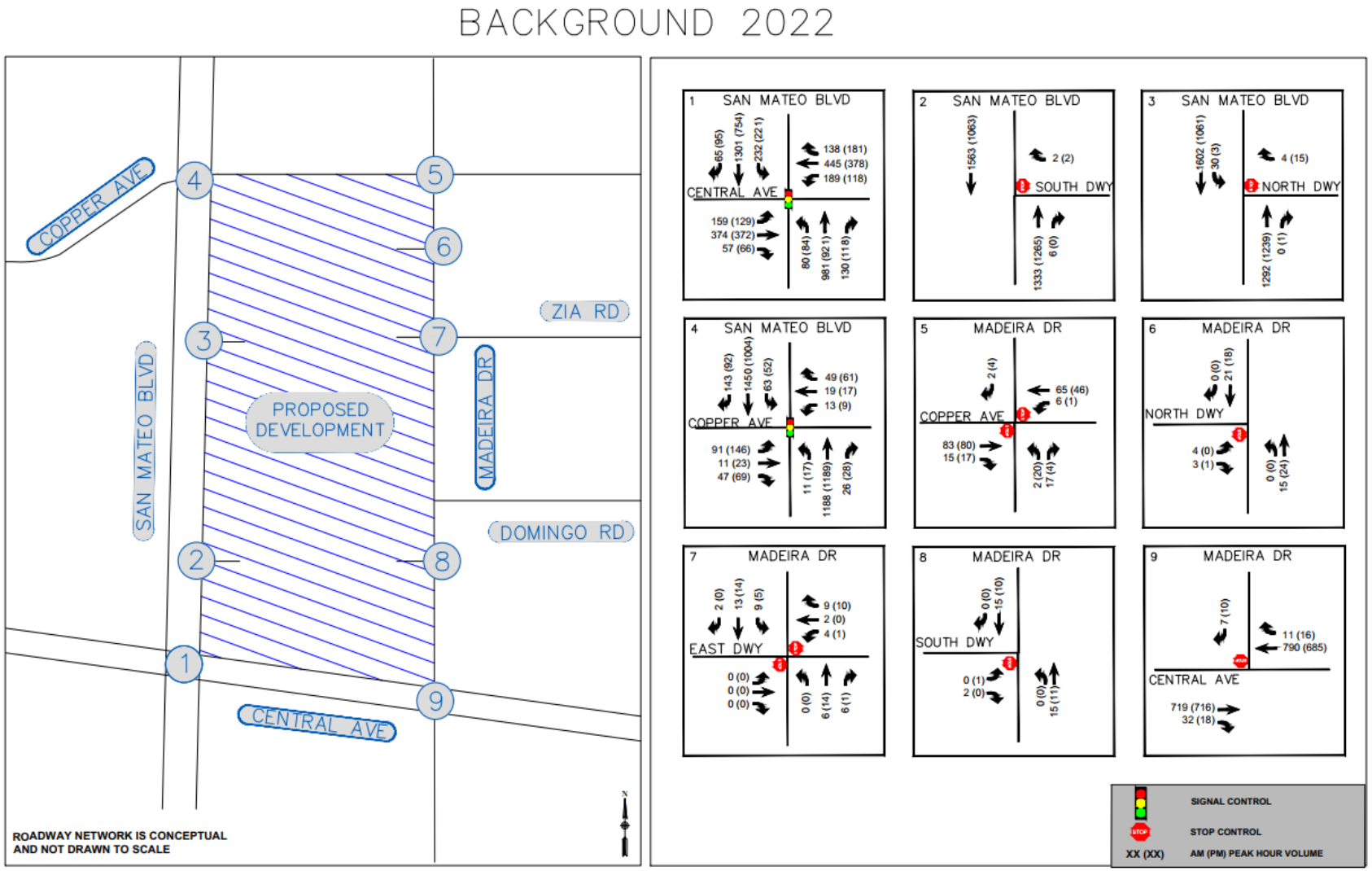

Figure 8. Background 2022 Turning Movement Traffic Volumes

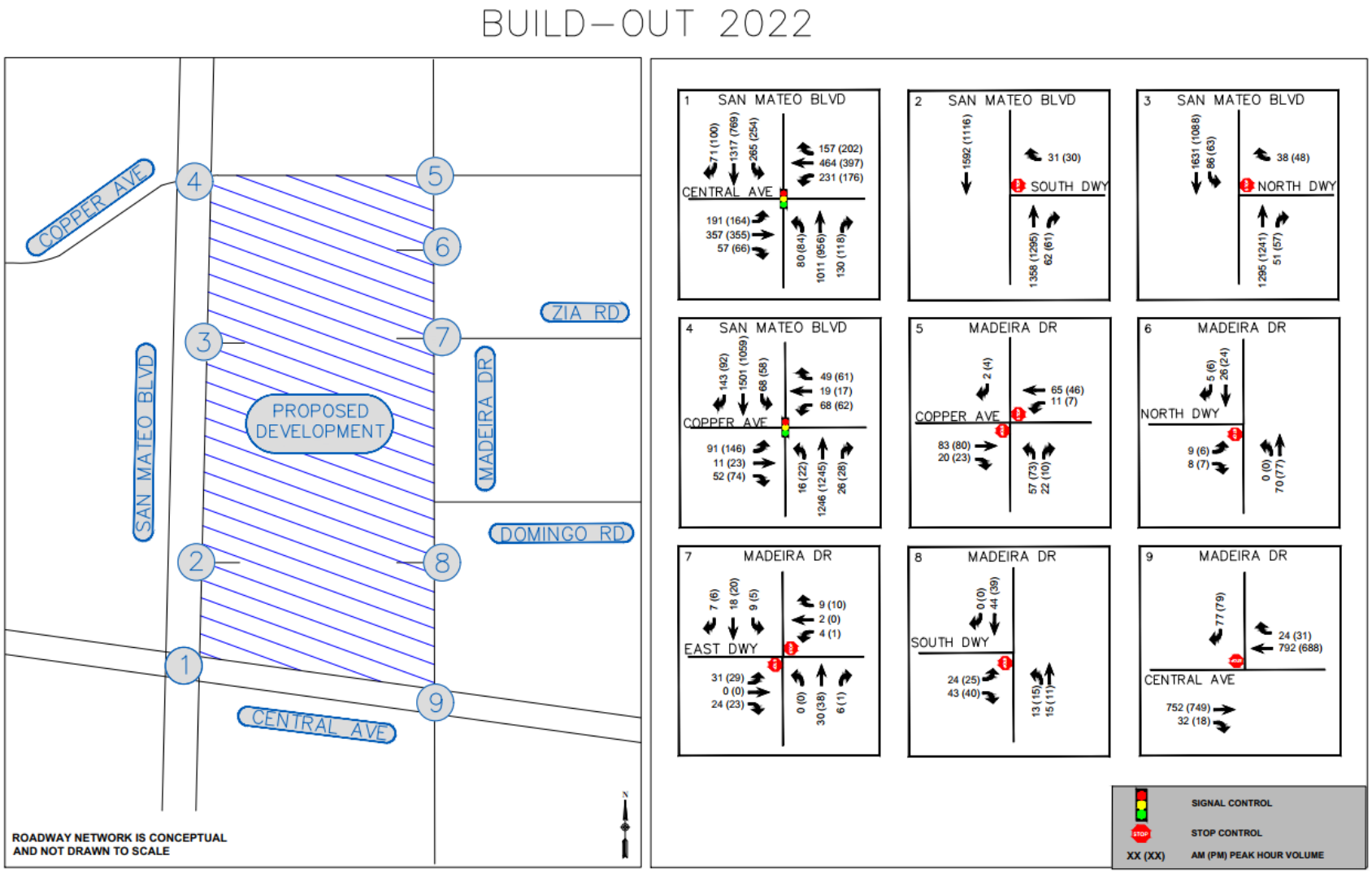

Figure 9. Full Build-Out 2022 Traffic Volumes

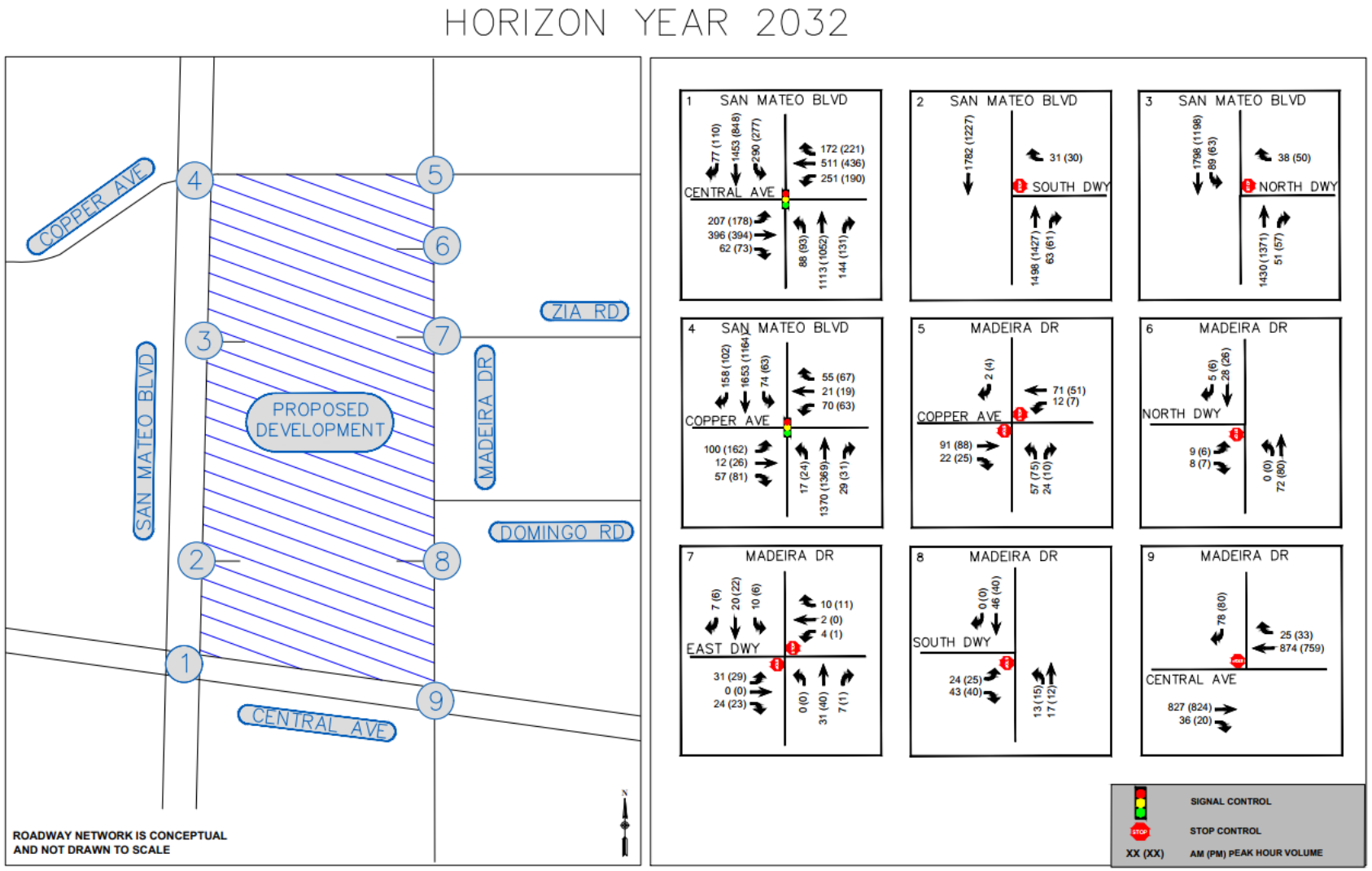

Figure 10. 2032 Horizon Year Traffic Volume

TRAFFIC ANALYSIS OF BUILD-OUT AND HORIZON YEAR

As performed for existing conditions, a LOS, capacity, and queuing analysis was performed for all future analysis scenarios using the same procedures and assumptions. Signal timings used in the existing conditions analysis were retained and used for background conditions, build-out condition analysis, and horizon year.

2022 Conditions

ANALYSIS OF SIGNALIZED INTERSECTIONS

Table 11 below summarizes intersection capacity and LOS analysis performed for 2022 conditions for the signalized intersection at San Mateo Blvd & Central Ave, and San Mateo Blvd & Copper Ave. Table 12 below summarizes queuing results. Detailed capacity output sheets can be found in Appendix D.

Table 11: 2022 Background Signalized Capacity Analysis Summary

San Mateo Blvd & Copper Ave					
2021 AM Background			2021 PM Background		
Time-Period	Delay	LOS	Time-Period	Delay	LOS
7:30	16.8	B	3:45	17.0	B
7:45	17.3	B	4:00	17.7	B
8:00	16.3	B	4:15	16.9	B
8:15	15.6	B	4:30	17.0	B
San Mateo Blvd & Central Ave					
2021 AM Background			2021 PM Background		
Time-Period	Delay	LOS	Time-Period	Delay	LOS
7:30	39.7	D	3:45	39.1	D
7:45	47.3	D	4:00	40.1	D
8:00	37.8	D	4:15	39.2	D
8:15	36.0	D	4:30	38.7	D

Table 12: 2022 Build-out Signalized Capacity Analysis Summary

San Mateo Blvd & Copper Ave					
2022 AM Build-out			2022 PM Build-out		
Time-Period	Delay	LOS	Time-Period	Delay	LOS
7:30	17.3	B	3:45	17.5	B
7:45	17.8	B	4:00	18.3	B
8:00	16.8	B	4:15	17.5	B
8:15	16.1	B	4:30	17.5	B
San Mateo Blvd & Central Ave					
2022 AM Build-out			2022 PM Build-out		
Time-Period	Delay	LOS	Time-Period	Delay	LOS
7:15	37.4	D	-	-	-
7:30	43.8	D	3:45	40.8	D
7:45	57.6	E	4:00	42.2	D
8:00	46.1	D	4:15	40.9	D
8:15	37.8	D	4:30	41.4	D

From the tables above, the following is summarized:

San Mateo Blvd & Copper Ave

- Capacity Analysis:
    - Under 2022 Background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours.
    - Under Full Build-Out conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours.

San Mateo Blvd & Central Ave

- Capacity Analysis:
    - Under 2022 Background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours.
    - Under Full Build-Out conditions, the intersection is observed to operate at an acceptable level of service in both the AM peak hour, except for one multi-peak period LOS E. During the PM peak hour, the intersection is observed to operate at an acceptable level of service.

Table 13: 2022 AM Background Signalized Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Copper Ave

San Mateo Blvd & Copper Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	26.5	23.4	24.1	-	24.1	24.5	24.9	15.0	15.6	21.5	16.6	17.0
7:45	25.4	23.5	24.7	-	23.8	24.5	26.6	15.5	16.2	23.2	17.2	17.8
8:00	27.3	23.5	24.1	-	24.1	23.6	23.0	14.3	14.8	20.6	15.9	16.1
8:15	26.2	23.4	23.7	-	23.6	24.5	19.5	14.5	15.0	20.7	14.3	14.4
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	0.1	0.0	0.1	-	0.08	0.10	0.05	0.41	0.4	0.2	0.57	0.6
7:45	0.1	0.0	0.1	-	0.05	0.10	0.06	0.45	0.5	0.2	0.61	0.6
8:00	0.2	0.0	0.1	-	0.08	0.03	0.04	0.35	0.4	0.3	0.52	0.5
8:15	0.2	0.0	0.0	-	0.01	0.10	0.09	0.37	0.4	0.2	0.39	0.4
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	C	C	C	-	C	C	C	B	B	C	B	B
7:45	C	C	C	-	C	C	C	B	B	C	B	B
8:00	C	C	C	-	C	C	C	B	B	C	B	B
8:15	C	C	C	-	C	C	B	B	B	C	B	B
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL	EBT	EBR (44')	WBL	WBT	WBR (40')	NBL (160')	NBT	NBR	SBL (150')	SBT	SBR
7:30	-	-	0.76	-	-	1.21	0.05	-	-	0.27	-	-
7:45	-	-	1.35	-	-	1.21	0.05	-	-	0.29	-	-
8:00	-	-	0.76	-	-	0.32	0.04	-	-	0.39	-	-
8:15	-	-	0.41	-	-	1.21	0.12	-	-	0.35	-	-

Table 14: 2022 PM Background Signalized Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Copper Ave

San Mateo Blvd & Copper Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	29.9	25.5	26.3	-	-	26.1	20.6	15.5	16.0	20.7	15.4	15.5
4:00	31.9	25.2	27.9	-	25.5	26.2	19.8	15.8	16.4	23.2	14.7	14.8
4:15	29.0	25.6	25.8	-	25.9	26.3	18.5	16.1	16.7	22.9	14.9	15
4:30	29.2	25.4	26.1	-	25.2	26.5	19.1	15.8	16.4	22.5	14.9	15
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	0.27	0.04	0.10		0.00	0.09	0.06	0.37	0.37	0.14	0.39	0.39
4:00	0.36	0.02	0.21		0.05	0.09	0.11	0.40	0.40	0.25	0.33	0.33
4:15	0.18	0.05	0.06		0.07	0.10	0.01	0.41	0.41	0.20	0.35	0.35
4:30	0.26	0.03	0.09		0.01	0.12	0.04	0.40	0.40	0.20	0.35	0.35
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	C	C	C	-	-	C	C	B	B	C	B	B
4:00	C	C	C	-	C	C	B	B	B	C	B	B
4:15	C	C	C	-	C	C	B	B	B	C	B	B
4:30	C	C	C	-	C	C	B	B	B	C	B	B
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL	EBT	EBR (44')	WBL	WBT	WBR (40')	NBL (160')	NBT	NBR	SBL (150')	SBT	SBR
3:45	-	-	1.17	-	-	1.14	0.08	-	-	0.21	-	-
4:00	-	-	2.53	-	-	1.21	0.18	-	-	0.37	-	-
4:15	-	-	0.69	-	-	1.31	0.02	-	-	0.27	-	-
4:30	-	-	1.01	-	-	1.59	0.06	-	-	0.29	-	-

Table 15: 2022 AM Full Build-Out Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Copper Ave

San Mateo Blvd & Copper Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	28.8	23.4	24.3	-	25.4	24.5	26.4	15.2	15.9	22.5	16.8	17.3
7:45	27.5	23.5	24.9	-	25.1	24.5	28.4	15.8	16.6	24.9	17.5	18.2
8:00	29.6	23.5	24.2	-	25.4	23.6	24.2	14.5	15.1	21.8	16.1	16.4
8:15	28.4	23.4	23.8	-	25.0	24.5	20.4	14.7	15.2	21.7	14.4	14.6
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	0.2	0.0	0.1	-	0.17	0.10	0.08	0.43	0.4	0.2	0.59	0.6
7:45	0.1	0.0	0.1	-	0.15	0.10	0.09	0.47	0.5	0.3	0.62	0.6
8:00	0.2	0.0	0.1	-	0.17	0.03	0.07	0.37	0.4	0.3	0.54	0.5
8:15	0.2	0.0	0.0	-	0.12	0.10	0.11	0.39	0.4	0.3	0.40	0.4
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	C	C	C	-	C	C	C	B	B	C	B	B
7:45	C	C	C	-	C	C	C	B	B	C	B	B
8:00	C	C	C	-	C	C	C	B	B	C	B	B
8:15	C	C	C	-	C	C	C	B	B	C	B	B
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL	EBT	EBR (44')	WBL	WBT	WBR (40')	NBL (160')	NBT	NBR	SBL (150')	SBT	SBR
7:30	-	-	0.93	-	-	1.21	0.07	-	-	0.30	-	-
7:45	-	-	1.44	-	-	1.21	0.08	-	-	0.35	-	-
8:00	-	-	0.85	-	-	0.32	0.07	-	-	0.45	-	-
8:15	-	-	0.49	-	-	1.21	0.14	-	-	0.38	-	-

Table 16: 2022 PM Full Build-Out Signalized Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Copper Ave

San Mateo Blvd & Copper Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	32.4	25.5	26.4	-	26.8	26.1	21.5	15.7	16.3	21.8	15.5	15.7
4:00	34.7	25.2	28.0	-	26.9	26.2	20.7	16.1	16.7	24.4	14.9	15
4:15	32.4	25.6	25.9	-	27.9	26.3	19.5	16.3	17.0	24.3	15.1	15.2
4:30	32.3	25.4	26.2	-	27.0	26.5	19.9	16.1	16.7	23.9	15.1	15.2
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	0.29	0.04	0.11	-	0.13	0.09	0.08	0.39	0.39	0.18	0.41	0.41
4:00	0.39	0.02	0.22	-	0.14	0.09	0.13	0.41	0.41	0.28	0.35	0.35
4:15	0.20	0.05	0.07	-	0.18	0.10	0.04	0.43	0.43	0.24	0.37	0.37
4:30	0.28	0.03	0.09	-	0.11	0.12	0.06	0.41	0.41	0.25	0.37	0.37
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	C	C	C	-	C	C	C	B	B	C	B	B
4:00	C	C	C	-	C	C	C	B	B	C	B	B
4:15	C	C	C	-	C	C	B	B	B	C	B	B
4:30	C	C	C	-	C	C	B	B	B	C	B	B
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL	EBT	EBR (44')	WBL	WBT	WBR (40')	NBL (160')	NBT	NBR	SBL (150')	SBT	SBR
3:45	-	-	1.26	-	-	1.14	0.11	-	-	0.26	-	-
4:00	-	-	2.70	-	-	1.21	0.21	-	-	0.41	-	-
4:15	-	-	0.84	-	-	1.31	0.06	-	-	0.33	-	-
4:30	-	-	1.08	-	-	1.59	0.08	-	-	0.35	-	-

From the tables above, the following is summarized:

San Mateo Blvd & Copper Ave

- Capacity Analysis:
  - Under 2022 Background conditions, individual movements are observed to operate at an acceptable Level of Service (LOS) for AM and PM peak hours.
  - Under Full Build-Out conditions, individual movements are observed to operate at an acceptable Level of Service (LOS) for AM peak
- Queueing Analysis:
  - Under 2022 Background conditions, 95th percentile Queue Storage Ratios (QSR) at the intersection are observed to be accommodated by existing storage lengths during the AM peak hour except for the eastbound right movement, which show a QSR greater than 1 for one multi-peak period, and the westbound right movement with a QSR greater than 1 for three multi-peak periods. During the PM peak hour, the QSR is exceeded in the eastbound right movement, which show a QSR greater than 1 for three multi-peak period, and the westbound right movement with a QSR greater than 1 for 4 multi-peak periods.
  - Under Full Build-Out conditions, the intersection has 95th percentile Queue Storage Ratios (QSR) in the same movements and number of multi-peak periods as the to 2022 Background conditions.

Table 17: 2022 AM Background Signalized Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Central Ave

San Mateo Blvd & Central Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	60.3	30.5	30.6	73.0	30.1	30.4	55.7	36.1	37.8	53.9	36.1	38.6
7:45	116.8	36.7	37.1	116.8	36.7	37.2	56.6	36.2	38.3	58.1	38.6	44.3
8:00	62.3	26.2	26.3	60.0	31.0	31.4	56.3	38.1	39.7	57.0	33.1	34.1
8:15	66.3	26.4	26.5	57.8	23.7	23.9	55.6	37.9	40.3	53.8	33.3	34.1
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	0.83	0.26	0.27	0.89	0.44	0.45	0.63	0.70	0.71	0.74	0.78	0.78
7:45	1.04	0.54	0.55	1.04	0.54	0.55	0.60	0.71	0.71	0.81	0.87	0.87
8:00	0.83	0.31	0.32	0.79	0.48	0.49	0.43	0.68	0.69	0.79	0.67	0.67
8:15	0.77	0.31	0.32	0.82	0.38	0.39	0.64	0.74	0.74	0.75	0.63	0.63
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	E	C	C	E	C	C	E	D	D	D	D	D
7:45	F	D	D	F	D	D	E	D	D	E	D	D
8:00	E	C	C	E	C	C	E	D	D	E	C	C
8:15	E	C	C	E	C	C	E	D	D	D	C	C
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL (120')	EBT	EBR	WBL (280')	WBT	WBR	NBL (200')	NBT	NBR	SBL (300')	SBT	SBR
7:30	1.73	-	-	1.17	-	-	0.32	-	-	0.42	-	-
7:45	3.40	-	-	1.46	-	-	0.25	-	-	0.61	-	-
8:00	2.15	-	-	0.73	-	-	0.12	-	-	0.57	-	-
8:15	0.74	-	-	0.70	-	-	0.34	-	-	0.43	-	-

Table 18: 2022 PM Background Signalized Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Central Ave

San Mateo Blvd & Central Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	63.2	23.9	24.1	62.9	25.0	25.3	60.5	42.0	43.1	58.6	37.8	38.5
4:00	62.4	26.2	26.3	61.6	27.7	28.1	60.9	42.8	44.5	58.3	34.7	35.2
4:15	62.7	25.0	25.2	62.5	25.2	25.5	61.9	42.2	43.8	58.6	35.1	35.5
4:30	70.7	27.5	27.7	62.3	24.6	24.8	60.5	40.4	42.4	58.5	35.6	36.3
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	0.80	0.29	0.29	0.81	0.36	0.37	0.65	0.70	0.71	0.75	0.58	0.59
4:00	0.82	0.27	0.28	0.83	0.40	0.41	0.63	0.73	0.73	0.79	0.48	0.49
4:15	0.81	0.32	0.32	0.81	0.33	0.34	0.59	0.73	0.73	0.75	0.49	0.49
4:30	0.76	0.30	0.31	0.82	0.37	0.38	0.65	0.73	0.73	0.75	0.62	0.62
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	E	C	C	E	C	C	E	D	D	D	C	C
4:00	E	C	C	E	C	C	E	D	D	D	C	C
4:15	E	C	C	E	C	C	E	D	D	D	C	C
4:30	E	C	C	E	C	C	E	D	D	E	D	D
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL (120')	EBT	EBR	WBL (280')	WBT	WBR	NBL (200')	NBT	NBR	SBL (300')	SBT	SBR
3:45	1.54	-	-	0.68	-	-	0.37	-	-	0.46	-	-
4:00	1.70	-	-	0.79	-	-	0.33	-	-	0.60	-	-
4:15	1.63	-	-	0.71	-	-	0.25	-	-	0.46	-	-
4:30	0.80	-	-	0.75	-	-	0.37	-	-	0.47	-	-

Table 19: 2022 AM Full Build-Out Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Central Ave

San Mateo Blvd & Central Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:15	57.0	26.9	27.1	60.8	24.6	24.9	57.6	37.1	37.9	54.3	35.7	37.3
7:30	66.3	31.0	31.2	104.6	33.2	33.6	55.7	37.4	39.7	55.2	36.0	38.8
7:45	169.0	36.2	36.6	197.1	37.8	38.4	56.6	37.9	40.8	60.7	39.1	45.1
8:00	110.5	30.8	30.9	126.4	36.4	37.0	56.3	38.5	40.4	59.2	32.3	33.3
8:15	61.2	29.1	29.4	64.7	27.1	27.4	55.6	38.4	41.3	55.7	32.4	33.2
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:15	0.82	0.28	0.29	0.87	0.35	0.36	0.33	0.61	0.62	0.72	0.74	0.74
7:30	0.86	0.26	0.26	1.01	0.51	0.51	0.63	0.73	0.74	0.77	0.78	0.78
7:45	1.19	0.53	0.53	1.23	0.58	0.59	0.60	0.75	0.75	0.83	0.88	0.88
8:00	0.79	0.35	0.36	0.72	0.57	0.58	0.43	0.70	0.70	0.82	0.67	0.67
8:15	0.78	0.33	0.33	0.85	0.44	0.45	0.64	0.75	0.76	0.78	0.62	0.62
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:15	E	C	C	E	C	C	E	D	D	D	D	D
7:30	E	C	C	F	C	C	E	D	D	E	D	D
7:45	F	D	D	F	D	D	E	D	D	E	D	D
8:00	F	C	C	F	D	D	E	D	D	E	C	C
8:15	E	C	C	E	C	C	E	D	D	E	C	C
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL (120')	EBT	EBR	WBL (280')	WBT	WBR	NBL (200')	NBT	NBR	SBL (300')	SBT	SBR
7:15	1.68	-	-	1.05	-	-	0.06	-	-	0.36	-	-
7:30	2.12	-	-	1.58	-	-	0.32	-	-	0.49	-	-
7:45	4.48	-	-	2.13	-	-	0.25	-	-	0.70	-	-
8:00	3.52	-	-	1.48	-	-	0.12	-	-	0.65	-	-
8:15	1.07	-	-	0.90	-	-	0.34	-	-	0.52	-	-

Table 20: 2022 PM Full Build-Out Signalized Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Central Ave

San Mateo Blvd & Central Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	61.8	31.7	32.0	61.3	34.0	34.5	60.5	44.2	46.8	50.6	31.7	32.1
4:00	61.2	32.6	32.8	63.1	35.7	36.3	60.9	44.8	48.0	53.3	30.5	30.9
4:15	61.5	33.0	33.1	61.1	33.8	34.3	61.9	44.9	48.4	50.6	29.4	29.7
4:30	62.3	32.9	33.0	62.0	36.1	36.7	61.9	45.5	49.9	52.3	28.5	28.8
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	0.84	0.35	0.36	0.85	0.49	0.50	0.65	0.75	0.75	0.47	0.49	0.50
4:00	0.85	0.32	0.32	0.86	0.52	0.53	0.63	0.77	0.77	0.59	0.43	0.44
4:15	0.84	0.38	0.39	0.85	0.45	0.46	0.59	0.77	0.77	0.47	0.41	0.42
4:30	0.83	0.35	0.36	0.84	0.52	0.53	0.59	0.81	0.81	0.55	0.44	0.45
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	E	C	C	E	C	C	E	D	D	D	C	C
4:00	E	C	C	E	D	D	E	D	D	D	C	C
4:15	E	C	C	E	C	C	E	D	D	D	C	C
4:30	E	C	C	E	D	D	E	D	D	D	C	C
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL (120')	EBT	EBR	WBL (280')	WBT	WBR	NBL (200')	NBT	NBR	SBL (300')	SBT	SBR
3:45	1.89	-	-	0.85	-	-	0.37	-	-	0.51	-	-
4:00	2.03	-	-	0.98	-	-	0.33	-	-	0.65	-	-
4:15	1.96	-	-	0.88	-	-	0.25	-	-	0.51	-	-
4:30	1.82	-	-	0.81	-	-	0.25	-	-	0.60	-	-

From the tables above, the following is summarized:

San Mateo Blvd & Central Ave

- Capacity Analysis:
    - Under 2022 Background conditions, individual movements are observed to operate at an acceptable Level of Service (LOS) for AM peak hour, with the exception of the eastbound left movement with LOS E in three multi-peak periods and LOS F in one multi-peak period, westbound left movement with LOS E in three multi-peak periods and LOS F in one multi-peak period, northbound left movement with LOS E in 4 multi-peak periods, and southbound left movement with LOS E in two multi-peak periods. During the PM peak hour, individual movements are observed to be at an acceptable Level of Service (LOS) with the exception of the eastbound left, westbound left, and northbound left movements with a LOS E in 4 multi-peak periods.
    - Under Full Build-Out conditions, individual movements are observed to operate at an acceptable Level of Service (LOS) for AM peak hour, with the exception of the eastbound left movement with LOS E in three multi-peak periods and LOS F in two multi-peak periods, westbound left movement with LOS E in two multi-peak periods and LOS F in three multi-peak period, northbound left movement with LOS E in 5 multi-peak periods, and southbound left movement with LOS E in 4 multi-peak periods. During the PM peak hour, individual movements are observed to be at an acceptable Level of Service (LOS) with the exception of the eastbound left, westbound left, and northbound left movements with a LOS E in 4 multi-peak periods.
- Queueing Analysis:
    - Under 2022 Background conditions, 95th percentile Queue Storage Ratios (QSR) at the intersection are observed to be accommodated by existing storage lengths during the AM peak hour except for the eastbound left movement with a QSR greater than 1 for three multi-peak periods, and the westbound left movement with a QSR greater than 1 for two multi-peak periods. During the PM peak hour, the QSR is exceeded in the eastbound left movement with a QSR greater than 1 for three multi-peak periods.
    - Under Full Build-Out conditions, 95th percentile Queue Storage Ratios (QSR) at the intersection are observed to be accommodated by existing storage lengths during the AM peak hour, except for the eastbound left movement with a QSR greater than 1 for 5 multi-peak periods, and the westbound left movement with a QSR greater than 1 for 4 multi-peak periods. During the PM peak hour, the QSR is exceeded in the eastbound left movement with a QSR greater than 1 for 5 multi-peak periods.

Analysis of Stop Controlled Intersections

Table 21 and Table 22 below summarizes stop-controlled intersection capacity, LOS analysis, and queuing results performed for 2022 background and full build-out conditions for the unsignalized intersections. Queueing is reported as number of vehicles in the queue for stop-controlled intersections. Detailed capacity output sheets can be found in Appendix D.

Table 21: 2022 Background Stop-Control Capacity & Queue Storage Analysis Summary

Madeira Dr & Copper Ave								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBL	0.00	7.4	A	0.00	0.00	7.4	A	0.00
NBT	0.02	9.0	A	0.10	0.03	9.5	A	0.10
SBR	0.00	8.6	A	0.00	0.00	8.6	A	0.00
Madeira Dr & Central Ave								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
SBR	0.01	11.1	B	0.00	0.02	10.4	B	0.00
Madeira Dr & North Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.01	8.6	A	0.00	0.00	8.7	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.3	A	0.00
Madeira Dr & Zia Rd								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBT	0.02	8.9	A	0.10	0.01	8.5	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.3	A	0.00
SBL	0.01	7.3	A	0.00	0.00	7.3	A	0.00
Madeira Dr & South Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.00	8.4	A	0.00	0.00	8.6	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.2	A	0.00
San Mateo Blvd & North Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBR	0.02	17.4	C	0.00	0.04	15.4	C	0.10
SBL	0.17	25.3	C	0.60	0.01	17.5	C	0.00
San Mateo Blvd & South Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBR	0.01	17.8	C	0.00	0.01	15.9	C	0.00

Table 22: 2022 Full Build-Out Stop-Control Capacity & Queue Storage Analysis Summary

Madeira Dr & Copper Ave								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBL	0.01	7.5	A	0.00	0.01	7.5	A	0.00
NBT	0.11	10.1	B	0.40	0.12	10.1	B	0.40
SBR	0.00	8.6	A	0.00	0.00	8.6	A	0.00
Madeira Dr & Central Ave								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
SBR	0.15	12.1	B	0.50	0.12	11.2	B	0.40
Madeira Dr & North Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.02	8.8	A	0.10	0.01	8.8	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.3	A	0.00
Madeira Dr & Zia Rd								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.09	9.3	A	0.30	0.07	9.2	A	0.20
WBT	0.03	9.3	A	0.10	0.01	8.7	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.3	A	0.00
SBL	0.01	7.3	A	0.00	0.00	7.3	A	0.00
Madeira Dr & South Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.11	9.3	A	0.40	0.09	9.1	A	0.30
NBL	0.01	7.4	A	0.00	0.01	7.4	A	0.00
San Mateo Blvd & North Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBR	0.16	20.3	C	0.60	0.14	17.1	C	0.50
SBL	0.52	42.2	E	3.00	0.24	22.3	C	0.90
San Mateo Blvd & South Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBR	0.14	20.9	C	0.50	0.11	18.0	C	0.40

From the tables above, the following is summarized:

Madeira Dr and Copper Ave

- Capacity Analysis:
  - Under background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
  - Under build-out conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under background conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.
  - Under build-out conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and Central Ave

- Capacity Analysis:
  - Under background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
  - Under build-out conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
  - Under build-out conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and North Site Access

- Capacity Analysis:
  - Under background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
  - Under build-out conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under background conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.
  - Under build-out conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and Zia Rd/East Site Access

- Capacity Analysis:
  - Under background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.

- Under build-out conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.

- Queueing Analysis:
  - Under background conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.
  - Under build-out conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and South Driveway

- Capacity Analysis:
  - Under background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
  - Under build-out conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under background conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.
  - Under build-out conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

San Mateo Blvd and North Driveway

- Capacity Analysis:
  - Under background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
  - Under build-out conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for the AM peak hour, except for the southbound approach LOS E. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for the PM peak hour.
- Queueing Analysis:
  - Under background conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.
  - Under build-out conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during PM peak hour. The 95th percentile lengths at the intersection are observed to exceed requirements in the southbound approach during the AM peak hour.

San Mateo Blvd and South Driveway

- Capacity Analysis:
  - Under background conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
  - Under build-out conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:

- Under background conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.
- Under build-out conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

2032 Horizon Year

Analysis of Signalized Intersections

Table 23 below summarizes intersection capacity and LOS analysis performed for 2032 Horizon Year for the conditions for the signalized intersection at San Mateo Blvd & Central Ave, and San Mateo Blvd & Copper Ave. **Error! Reference source not found.** below summarizes queuing results. Detailed capacity output sheets can be found in Appendix D.

Table 23: 2032 Horizon Year Signalized Capacity Analysis Summary

San Mateo Blvd & Copper Ave					
2022 AM Horizon			2022 PM Horizon		
Time-Period	Delay	LOS	Time-Period	Delay	LOS
7:30	18.2	B	3:45	18.1	B
7:45	18.9	B	4:00	18.9	B
8:00	17.5	B	4:15	18.0	B
8:15	16.6	B	4:30	18.1	B
San Mateo Blvd & Central Ave					
2022 AM Horizon			2022 PM Horizon		
Time-Period	Delay	LOS	Time-Period	Delay	LOS
7:15	38.2	D	-	-	-
7:30	51.8	D	3:45	41.9	D
7:45	84.0	F	4:00	43.8	D
8:00	74.5	E	4:15	42.3	D
8:15	54.8	D	4:30	43.0	D
8:30	50.0	D	-	-	-
8:45	44.6	D	-	-	-

From the table above, the following is summarized:

San Mateo Blvd & Copper Ave

- Capacity Analysis:
  - Under 2032 Horizon Year conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours.

San Mateo Blvd & Central Ave

- Capacity Analysis:
  - Under 2032 Horizon Year conditions, the intersection is observed to operate at an acceptable level of service in PM peak hour. During the AM peak hour, the intersection is observed to operate at an acceptable level of service except for one multi-peak period LOS F and one multi-peak period LOS E.

Table 24: 2032 AM Horizon Year Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Copper Ave

San Mateo Blvd & Copper Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	29.2	23.4	24.3	-	25.6	24.6	29.7	15.8	16.5	25.2	17.9	18.7
7:45	27.8	23.5	25.0	-	25.1	24.6	32.4	16.5	17.4	28.1	18.8	19.9
8:00	30.2	23.5	24.3	-	25.5	23.6	26.8	15.0	15.6	24.0	17.0	17.5
8:15	28.7	23.4	23.8	-	25.0	24.6	22.4	15.1	15.8	24.1	14.9	15.1
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	0.2	0.0	0.1	-	0.18	0.11	0.09	0.47	0.5	0.3	0.64	0.6
7:45	0.1	0.0	0.1	-	0.15	0.11	0.10	0.52	0.5	0.3	0.69	0.7
8:00	0.2	0.0	0.1	-	0.18	0.03	0.08	0.41	0.4	0.4	0.59	0.6
8:15	0.2	0.0	0.1	-	0.12	0.11	0.14	0.42	0.4	0.3	0.44	0.4
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:30	C	C	C	-	C	C	C	B	B	C	B	B
7:45	C	C	C	-	C	C	C	B	B	C	B	B
8:00	C	C	C	-	C	C	C	B	B	C	B	B
8:15	C	C	C	-	C	C	C	B	B	C	B	B
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL	EBT	EBR (44')	WBL	WBT	WBR (40')	NBL (160')	NBT	NBR	SBL (150')	SBT	SBR
7:30	-	-	0.99	-	-	1.36	0.08	-	-	0.38	-	-
7:45	-	-	1.60	-	-	1.36	0.09	-	-	0.41	-	-
8:00	-	-	0.93	-	-	0.38	0.07	-	-	0.51	-	-
8:15	-	-	0.55	-	-	1.36	0.17	-	-	0.46	-	-

Table 25: 2032 PM Horizon Year Signalized Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Copper Ave

San Mateo Blvd & Copper Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	32.4	25.5	26.4	-	26.8	26.1	21.5	15.7	16.3	21.8	15.5	15.7
4:00	34.7	25.2	28.0	-	26.9	26.2	20.7	16.1	16.7	24.4	14.9	15
4:15	32.4	25.6	25.9	-	27.9	26.3	19.5	16.3	17.0	24.3	15.1	15.2
4:30	32.3	25.4	26.2	-	27.0	26.5	19.9	16.1	16.7	23.9	15.1	15.2
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	0.29	0.04	0.11	-	0.13	0.09	0.08	0.39	0.39	0.18	0.41	0.41
4:00	0.39	0.02	0.22	-	0.14	0.09	0.13	0.41	0.41	0.28	0.35	0.35
4:15	0.20	0.05	0.07	-	0.18	0.10	0.04	0.43	0.43	0.24	0.37	0.37
4:30	0.28	0.03	0.09	-	0.11	0.12	0.06	0.41	0.41	0.25	0.37	0.37
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	C	C	C	-	C	C	C	B	B	C	B	B
4:00	C	C	C	-	C	C	C	B	B	C	B	B
4:15	C	C	C	-	C	C	B	B	B	C	B	B
4:30	C	C	C	-	C	C	B	B	B	C	B	B
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL	EBT	EBR (44')	WBL	WBT	WBR (40')	NBL (160')	NBT	NBR	SBL (150')	SBT	SBR
3:45	-	-	1.26	-	-	1.14	0.11	-	-	0.26	-	-
4:00	-	-	2.70	-	-	1.21	0.21	-	-	0.41	-	-
4:15	-	-	0.84	-	-	1.31	0.06	-	-	0.33	-	-
4:30	-	-	1.08	-	-	1.59	0.08	-	-	0.35	-	-

From the tables above, the following is summarized:

San Mateo Blvd & Copper Ave

- Capacity Analysis:
  - Under 2032 Horizon Year conditions, individual movements are observed to operate at an acceptable Level of Service (LOS) for the AM and PM peak hours.
- Queueing Analysis:
  - Under 2032 Horizon Year conditions, queue conditions are similar to existing and 2022 conditions, 95th percentile Queue Storage Ratio (QSR) is observed to be exceeded in the PM peak hour for northbound right and westbound right movements.

Table 26: 2032 AM Horizon Year Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Central Ave

San Mateo Blvd & Central Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:15	56.8	30.4	30.6	67.4	27.8	28.2	57.6	36.2	37.0	54.1	35.0	36.9
7:30	74.8	31.5	31.7	196.0	38.3	38.9	55.4	38.9	42.9	56.5	36.8	40.6
7:45	245.9	37.8	38.1	528.6	39.7	40.4	56.2	41.3	46.3	63.0	48.1	58.2
8:00	306.1	34.0	34.2	458.4	40.4	41.2	56.4	38.9	41.6	61.4	31.9	33.2
8:15	161.0	33.3	33.6	277.5	36.4	37.1	55.2	39.5	43.6	57.3	32.2	33.4
8:30	76.0	33.9	34.1	170.3	38.2	38.8	56.7	43.8	50.3	64.5	28.1	28.9
8:45	66.7	33.3	33.4	82.6	38.7	39.6	55.4	40.1	44.3	60.1	34.3	37
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:15	0.83	0.35	0.35	0.89	0.41	0.42	0.33	0.63	0.64	0.73	0.76	0.76
7:30	0.87	0.29	0.29	1.27	0.61	0.62	0.64	0.80	0.80	0.79	0.82	0.82
7:45	1.38	0.58	0.58	1.42	0.64	0.65	0.61	0.82	0.82	0.85	0.95	0.96
8:00	0.90	0.43	0.43	0.75	0.66	0.67	0.45	0.74	0.74	0.84	0.69	0.69
8:15	0.58	0.41	0.41	0.80	0.60	0.60	0.65	0.79	0.80	0.80	0.66	0.66
8:30	0.87	0.42	0.43	0.89	0.60	0.61	0.37	0.85	0.85	0.86	0.61	0.61
8:45	0.84	0.39	0.39	0.88	0.68	0.69	0.64	0.80	0.80	0.83	0.76	0.76
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:15	E	C	C	E	C	C	E	D	D	D	C	C
7:30	E	C	C	F	D	D	E	D	D	E	D	D
7:45	F	D	D	F	D	D	E	D	D	E	D	E
8:00	F	C	C	F	D	D	E	D	D	E	C	C
8:15	F	C	C	F	D	D	E	D	D	E	C	C
8:30	E	C	C	F	D	D	E	D	D	E	C	C
8:45	E	C	C	F	D	D	E	D	D	E	C	D
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL (120')	EBT	EBR	WBL (280')	WBT	WBR	NBL (200')	NBT	NBR	SBL (300')	SBT	SBR
7:15	1.79	-	-	1.19	-	-	0.06	-	-	0.39	-	-
7:30	2.42	-	-	2.27	-	-	0.35	-	-	0.55	-	-
7:45	5.77	-	-	4.03	-	-	0.27	-	-	0.76	-	-
8:00	6.63	-	-	3.83	-	-	0.13	-	-	0.72	-	-
8:15	2.73	-	-	2.49	-	-	0.37	-	-	0.58	-	-
8:30	2.36	-	-	1.66	-	-	0.08	-	-	0.80	-	-
8:45	1.86	-	-	1.15	-	-	0.35	-	-	0.68	-	-

Table 27: 2032 PM Horizon Year Signalized Capacity Analysis & Queue Storage Summary at San Mateo Blvd & Central Ave

San Mateo Blvd & Central Ave												
Delay (s/veh)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	61.8	34.8	35.2	63.4	38.0	38.7	60.2	44.5	48.0	51.5	31.4	31.8
4:00	64.7	35.7	36.0	67.7	40.5	41.4	60.5	45.2	49.2	55.1	30.1	30.4
4:15	64.0	36.3	36.6	65.0	37.7	38.5	61.5	45.3	49.8	51.5	28.9	29.2
4:30	64.1	35.8	36.0	65.3	40.3	41.1	61.5	47.0	53.0	53.5	28.2	28.5
V/C												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	0.85	0.41	0.42	0.86	0.57	0.58	0.66	0.78	0.78	0.51	0.52	0.53
4:00	0.86	0.38	0.39	0.88	0.62	0.62	0.65	0.80	0.80	0.65	0.46	0.47
4:15	0.86	0.46	0.46	0.86	0.53	0.54	0.60	0.80	0.80	0.51	0.44	0.45
4:30	0.85	0.42	0.42	0.85	0.61	0.61	0.60	0.85	0.85	0.60	0.47	0.48
Level of Service (LOS)												
Time-Period	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
3:45	E	C	D	E	D	D	E	D	D	D	C	C
4:00	E	D	D	E	D	D	E	D	D	E	C	C
4:15	E	D	D	E	D	D	E	D	D	D	C	C
4:30	E	D	D	E	D	D	E	D	D	D	C	C
95th Percentile Queue Storage Ratio (QSR)												
	Movement (Storage Length Present)											
Time-Period	EBL (120')	EBT	EBR	WBL (280')	WBT	WBR	NBL (200')	NBT	NBR	SBL (300')	SBT	SBR
3:45	2.00	-	-	0.92	-	-	0.41	-	-	0.56	-	-
4:00	2.24	-	-	1.08	-	-	0.37	-	-	0.71	-	-
4:15	2.15	-	-	0.96	-	-	0.27	-	-	0.56	-	-
4:30	1.96	-	-	0.88	-	-	0.27	-	-	0.66	-	-

From the tables above, the following is summarized:

San Mateo Blvd & Central Ave

- Capacity Analysis:
  - Under 2032 Horizon Year conditions, individual movements are observed to operate at an acceptable Level of Service (LOS) for AM peak hour, with the exception of the eastbound left movement with LOS E in 4 multi-peak periods and LOS F in three multi-peak periods, westbound left movement with LOS E in one multi-peak period and LOS F in 6 multi-peak period, northbound left movement with LOS E in 7 multi-peak periods, southbound left movement with LOS E in 6 multi-peak periods, and southbound right movement with LOS E in one multi-peak period.
  - During the PM peak hour, individual movements are observed to be at an acceptable Level of Service (LOS) with the exception of the eastbound left movement with LOS E for 4 multi-peak periods, westbound left movement with LOS E for 4 multi-peak periods, northbound left movement with a LOS E for 4 multi-peak periods, and southbound left movement LOS E for one multi-peak period.
- Queueing Analysis:
  - Under 2032 Horizon Year conditions, 95th percentile Queue Storage Ratios (QSR) at the intersection are observed to be accommodated by existing storage lengths during the AM peak hour, except for the eastbound left movement with a QSR greater than 1 for 7 multi-peak periods, and the westbound left movement with a QSR greater than 7 for one multi-peak periods. During the PM peak hour, the QSR is exceeded in the eastbound left movement with a QSR greater than 1 for 4 multi-peak periods, and the westbound left movement with a QSR greater than 1 for one multi-peak period.

Analysis of Stop Controlled Intersections

Table 28 below summarizes stop-controlled intersection capacity, LOS analysis, and queuing results performed for 2032 Horizon Year for the unsignalized intersections. Queueing is reported as number of vehicles in the queue for stop-controlled intersections. Detailed capacity output sheets can be found in Appendix D.

Table 28: 2032 Horizon Year Stop Control Capacity & Queue Storage Analysis Summary

Madeira Dr & Copper Ave								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBL	0.01	7.5	A	0.00	0.01	7.5	A	0.00
NBT	0.12	10.2	B	0.40	0.12	10.3	B	0.40
SBR	0.00	8.7	A	0.00	0.00	8.6	A	0.00
Madeira Dr & Central Ave								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
SBR	0.16	12.7	B	0.60	0.13	11.6	B	0.50
Madeira Dr & North Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.02	8.9	A	0.10	0.01	8.8	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.3	A	0.00
Madeira Dr & Zia Rd								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.09	9.3	A	0.30	0.07	9.2	A	0.20
WBT	0.03	9.4	A	0.10	0.02	8.7	A	0.00
NBL	0.00	7.3	A	0.00	0.00	7.3	A	0.00
SBL	0.01	7.3	A	0.00	0.00	7.3	A	0.00
Madeira Dr & South Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
EBT	0.11	9.3	A	0.40	0.09	9.1	A	0.30
NBL	0.01	7.4	A	0.00	0.01	7.3	A	0.00
San Mateo Blvd & North Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBR	0.18	22.7	C	0.70	0.16	18.7	C	0.60
SBL	0.64	64.1	F	4.70	0.27	26.2	D	1.10
San Mateo Blvd & South Driveway								
Movement	AM				PM			
	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)	v/c	Delay (s/veh)	LOS	95th Percentile Queue (veh)
WBR	0.16	23.5	C	0.60	0.14	19.7	C	0.40

From the table above, the following is summarized:

Madeira Dr and Copper Ave

- Capacity Analysis:
  - Under horizon conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under horizon conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and Central Ave

- Capacity Analysis:
  - Under horizon conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under horizon conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and North Site Access

- Capacity Analysis:
  - Under horizon conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under horizon conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and Zia Rd/East Site Access

- Capacity Analysis:
  - Under horizon conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under horizon conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

Madeira Dr and South Driveway

- Capacity Analysis:
  - Under horizon conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under horizon conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.
  - are observed to be accommodated and acceptable during AM and PM peak hours.

San Mateo Blvd and North Driveway

- Capacity Analysis:
  - Under horizon conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for the AM peak hour, except for the southbound approach LOS F. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for the PM peak hour.
- Queueing Analysis:
  - Under horizon conditions, 95th percentile lengths at the intersection are observed to exceed requirements in the southbound approach during the AM and PM peak hours.

San Mateo Blvd and South Driveway

- Capacity Analysis:
  - Under horizon conditions, the intersection is observed to operate at an acceptable level of service in both the AM and PM peak hours. Individual movements are also observed to operate at an acceptable Level of Service (LOS) for both AM and PM peak hours.
- Queueing Analysis:
  - Under horizon conditions, 95th percentile lengths at the intersection are observed to be accommodated and acceptable during AM and PM peak hours.

CAPACITY MITIGATIONS AND STREET IMPROVEMENTS

As shown in the above section, few capacity queueing issues are observed for all conditions within the study area. The following provides a summary of the queueing issues as well as recommended mitigations for the study intersections.

For San Mateo Blvd & Copper Ave, capacity and queueing issues are summarized as follows:

- Eastbound Right Turn QSR in the AM and PM peak hours.
- Westbound Right Turn QSR in the AM and PM peak hours.

It is noted that the QSR is related to the short de facto turn lane present at the intersection. It is recommended that the signal be re-timed upon opening of the full development to better accommodate shifting traffic patterns.

For San Mateo Blvd & Central Ave, capacity and queueing issues are summarized as follows:

- Eastbound Left Turn QSR in the AM and PM peak hours.
- Westbound Left Turn QSR in the AM and PM peak hours.

No recommendations are made as QSR issues observed under existing conditions. It is recommended that the signal be re-timed upon opening of the full development to better accommodate shifting traffic patterns.

SITE ACCESS ANALYSIS

ACCESS SPACING

Required minimum distances between commercial site access and intersections were analyzed using criteria defined in the CABQ DPM. Criteria was applied to three site access driveways, San Mateo South Access Driveway, Madeira North Access Driveway, and Madeira South Access Driveway. Approximate distances from the San Mateo South Access Driveway to the adjacent intersection at San Mateo Blvd & Central Ave were

measured, as well as Madeira North Access Driveway to the adjacent intersection at Madeira Dr and Copper Ave, and Madeira South Access Driveway to the adjacent intersection at Madeira Dr and Central Ave. CABQ and MRCOG data was used to define the functional class of streets used. Results of the analysis are shown below in Table 29

Table 29: Commercial Site Access Analysis

Minimum Distance Between Commercial Site Access and Intersection						
Site Access Location	Major Street (Functional Class)	Cross Street (Functional Class)	Approach Distance to Intersection (ft)	Minimum Approach Distance Required (ft)	Departure Distance to Intersection (ft)	Minimum Departure Distance to Intersection (ft)
San Mateo Blvd & South Driveway (Right-in, Right-out Driveway)	San Mateo Blvd (Principal Arterial)	Central Ave (Principal Arterial)	180	200	-	-
Madeira Dr & North Driveway (Full-Access Driveway)	Madeira Dr (Local Road)	Copper Ave (Major Collector)	-	-	150	75
Madeira Dr & South Driveway (Full-Access Driveway)	Madeira Dr (Local Road)	Central Ave (Principal Arterial)	-	-	250	75

- San Mateo Blvd & South Driveway (Right-in, Right-out Driveway)
    - Based on CABQ DPM criteria per Table 7.4.45, the minimum distance between commercial site access and intersection requires 200 ft. of approach distance. Measured approach distance is approximately 180 ft from the intersection of San Mateo Blvd and Central Ave. While this spacing does not meet the DPM recommended spacing, it is noted that this existing driveway is only 20 feet under recommended spacing.
- Madeira Dr & North Driveway (Full-Access Driveway)
    - Based on CABQ DPM criteria per Table 7.4.45, the minimum distance between commercial site access and intersection requires 200 ft. of approach distance. Measured departure distance is approximately 150 ft from the intersection of Madeira Dr and Copper Ave.
- Madeira Dr & South Driveway (Full-Access Driveway)
    - Based on CABQ DPM criteria per Table 7.4.45, the minimum distance between commercial site access and intersection requires 200 ft. of approach distance. Measured departure distance is approximately 250 ft from the intersection of Madeira Dr and Central Ave.

Curb Return Access Widths

Based on CABQ DPM access guidelines per section 7.4. (B)(5)(i) curb returns are recommended at all site access driveways for high-volume traffic generators and for developments with median access and 25 or more parking spaces. Driveway widths specified in CABQ DPM Table 7.4.47 require two-lane driveways entrances for Arterials & Collectors to be between 22-30 ft, and for Local Streets to be between 22-24 ft.

- Madeira Dr and North Driveway
    - Based on CABQ DPM criteria, curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM. Existing driveway width was measured to fall within the 22-24 ft range required for driveway entrances.
- Madeira Dr and Zia Rd/East Site Access
    - Based on CABQ DPM criteria, curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM. Existing driveway width was measured to fall within the 22-24 ft range required for driveway entrances.
- Madeira Dr and South Driveway
    - Based on CABQ DPM criteria, curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM. Existing driveway width was measured to fall within the 22-30 ft range required for driveway entrances.

- San Mateo Blvd and North Driveway
    - Based on CABQ DPM criteria, curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM. Existing driveway width was measured to fall within the 22-30 ft range required for driveway entrances.
- San Mateo Blvd and South Driveway
    - Based on CABQ DPM criteria, curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM. Existing driveway width was measured to fall within the 22-30 ft range required for driveway entrances.

Auxiliary Lane Analysis

CABQ DPM auxiliary lane warrants were reviewed for the site access driveway(s). DPM Table 7.4.67 was used to determine if right-turn auxiliary lanes would be warranted for site access points on Carlisle Blvd. DPM Tables 7.4.68 and 7.4.69 were used to determine deceleration length and taper length, if applicable. It is important to note 2022 Full Build-Out traffic volumes were used in the analysis. The results of this analysis are shown in Table 30.

Table 30: Auxiliary Lane Analysis

Turning Lane	Left Turn			Right Turn		
	Design Speed (mph)	Turning Volume per Hour	Warrant Results	Design Speed (mph)	Turning Volume per Hour	Warrant Results
San Mateo Blvd & North Driveway (Full Access)	Existing			40	57	Required
San Mateo Blvd & South Driveway (Right-in, Right-out Driveway)	N/A			40	62	Required

Based on the information presented in Table 30, right turn auxiliary lanes are warranted at both of the site access driveways based on CABQ DPM criteria for new trips added to the existing network. The CABQ DPM states auxiliary left-turning lanes are warranted when the turning volumes exceed 40 vehicles for any given peak for roadways signed at 40 mph. The CABQ DPM states auxiliary right-turning lanes are warranted when the turning volumes exceed 50 vehicles for any given peak for roadways signed at 40 mph.

For the right turn lanes, the CABQ DPM requires a deceleration distance of 240 to 350 feet with an 8:1 taper. It is noted that for the south driveway, full deceleration length and taper may not be possible because of its proximity to Central Ave.

Site Access Recommendations

- Madeira Dr and North Driveway
    - Curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM.
- Madeira Dr and Zia Rd/East Site Access
    - Curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM.
- Madeira Dr and South Driveway
    - Curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM.
- San Mateo Blvd and North Driveway
    - Curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM. It is recommended to install right-turn deceleration lane.
- San Mateo Blvd and South Driveway
    - Curb returns are recommended for this access driveway. Designed elements are available in the CABQ DPM. It is recommended to install right-turn deceleration lane.

CRASH DATA SUMMARY

A detailed crash summary has been completed to summarize existing crash trends and to determine possible safety impacts to the study area. Aggregate crash data were obtained for the study area for the most recently available five years. This included the years 2015 to 2019. Crashes were then summarized by year, type, lighting conditions, severity, and cause. Table 31 shows the severity of the crashes. To compare and summarize trends, all crashes reported in the adjacent area near the project's access driveways were grouped by intersection or roadway segment.

Table 31: Crash Data Summary

Crash Summary		Central Ave & San Mateo Blvd	Central Ave and Madeira Dr	Copper Ave and Madeira Dr	Copper Ave & San Mateo Blvd
	Total Crashes	**259**	**21**	**1**	**45**
By Year	2015	56	3	0	10
	2016	52	10	0	10
	2017	52	3	0	11
	2018	53	2	1	6
	2019	46	3	0	8
Category	Fixed Object	5	0	0	6
	Invalid Code/Left Blank	62	2	1	7
	Non-Collision - All Other/Not Stated	2	0	0	0
	Other (Non-Collision)	0	0	0	0
	Other Vehicle - All Others/Entering At Angle	4	0	0	1
	Other Vehicle - Both Going Straight/Entering At Angle	20	3	0	8
	Other Vehicle - Both Turn Left/Entering At Angle	3	0	0	0
	Other Vehicle - Both Turn Right/Entering At Angle	4	0	0	0
	Other Vehicle - From Opposite Direction	28	1	0	9
	Other Vehicle - From Opposite Direction/Both Going Straight	4	3	0	0
	Other Vehicle - From Opposite Direction/One Left Turn	4	2	0	0
	Other Vehicle - From Opposite Direction/One Right Turn	0	0	0	1
	Other Vehicle - From Opposite Direction/Sideswipe Collision	2	0	0	0
	Other Vehicle - From Same Direction/All Others	1	0	0	0
	Other Vehicle - From Same Direction/Both Going Straight	25	0	0	4
	Other Vehicle - From Same Direction/One Right Turn	1	0	0	0
	Other Vehicle - From Same Direction/One Stopped	4	0	0	1
	Other Vehicle - From Same Direction/Rear End Collision	40	2	0	4
	Other Vehicle - From Same Direction/Sideswipe Collision	6	1	0	0
	Other Vehicle - From Same Direction/Vehicle Backing	0	1	0	0
	Other Vehicle - One Left Turn/Entering At Angle	11	1	0	2
	Other Vehicle - One Right Turn/Entering At Angle	3	1	0	0
	Other Vehicle - One Vehicle/Back From Parked Position	1	0	0	0
	Other Vehicle - One Vehicle/Backing From Other Than Driveway	1	0	0	0
	Parked Vehicle	3	1	0	0
	Pedalcyclist	1	0	0	0
	Pedestrian	24	1	0	2
	Vehicle Struck Pedalcyclist At Angle	2	2	0	0
	% Other Vehicle - From Opposite Direction	11%	5%	0%	20%
	% Other Vehicle - Both Going Straight/Entering At Angle	8%	14%	0%	18%
	% Other Vehicle - From Same Direction/Rear End Collision	15%	10%	0%	9%

Crash Summary		Central Ave & San Mateo Blvd	Central Ave and Madeira Dr	Copper Ave and Madeira Dr	Copper Ave & San Mateo Blvd
	Total Crashes	**259**	**21**	**1**	**45**
By Lighting Conditions	Day	182	18	0	35
	Dawn/Dusk	9	1	0	1
	Dark	46	1	0	6
	Invalid Code/Not Specified	22	1	1	3
	% Daytime	70%	86%	0%	78%
	% Dark	18%	5%	0%	13%
By Severity	PDO	180	13	1	33
	Injury	78	8	0	12
	Fatality	1	0	0	0
	% Property Damage Only	69%	62%	100%	73%
	% Injury	30%	38%	0%	27%
By Contributing Factors	Alcohol/Drug Involved	21	0	0	5
	Avoid No Contact - Other	8	0	0	1
	Avoid No Contact - Vehicle	2	0	0	1
	Defective Steering	0	0	0	0
	Defective Tires	0	0	0	0
	Disregarded Traffic Signal	27	1	0	5
	Driver Inattention	61	4	0	12
	Driverless Moving Vehicle	0	0	0	0
	Drove Left Of Center	1	0	0	1
	Excessive Speed	12	2	0	4
	Failed to Yield Right of Way	15	8	0	3
	Following Too Closely	30	1	0	7
	Improper Backing	2	1	0	0
	Improper Lane Change	5	0	0	1
	Improper Overtaking	5	0	0	0
	Inadequate Brakes	1	0	0	0
	Made Improper Turn	9	1	0	0
	None/Missing Data	36	1	1	2
	Other - No Driver Error	5	0	0	2
	Other Improper Driving	6	2	0	0
	Other Mechanical Defect	1	0	0	0
	Passed Stop Sign	1	0	0	0
	Pedestrian Error	7	0	0	0
	Road Defect	0	0	0	0
	Speed Too Fast for Conditions	3	0	0	1
	Vehicle Skidded Before Brake	1	0	0	0
	%Driver Inattention	24%	19%	0%	27%
	%Failed to Yield Right of Way	6%	38%	0%	7%
	%Disregarded Traffic Signal	10%	5%	0%	11%
	%Following Too Closely	12%	5%	0%	16%

From the table shown above, the following observations are made:

- Central Ave and San Mateo Blvd Intersection:
    - The two most common classifications of vehicle crashes are observed to be *Other Vehicle - From Same Direction/Rear End Collision* and *Other Vehicle - From Opposite Direction*.
    - For the years 2015 to 2019, 259 crashes were reported.
    - A majority of crashes for the intersections occurred during the daylight hours totaling 70% of crashes.
    - One fatal crash was reported from 2015 to 2019, and 30% remaining crashes reported involved injuries.
    - The most common causes of crashes are observed to be Driver Inattention, Following Too Closely, Disregarded Traffic Signal, and Alcohol/Drug Involved.
- Copper Ave & San Mateo Blvd Intersection:
    - The two most common classifications of vehicle crashes are observed to be *Other Vehicle - From Opposite Direction* and *Other Vehicle - Both Going Straight/Entering At Angle*.
    - For the years 2015 to 2019, 45 crashes were reported.
    - A majority of crashes for the intersections occurred during the daylight hours totaling 78% of crashes.
    - No fatal crashes were reported from 2015 to 2019, and 27% remaining crashes reported involved injuries.
    - The most common causes of crashes are observed to be Driver Inattention, Following Too Closely, Alcohol/Drug Involved, and Disregarded Traffic Signal.
- Central Ave and Madeira Dr Intersection:
    - The two most common classifications of vehicle crashes are observed to be *Other Vehicle - Both Going Straight/Entering At Angle* and *Other Vehicle - From Opposite Direction/Both Going Straight*.
    - For the years 2015 to 2019, 21 crashes were reported.
    - A majority of crashes for the intersections occurred during the daylight hours totaling 86% of crashes.
    - No fatal crashes were reported from 2015 to 2019, and 38% remaining crashes reported involved injuries.
    - The most common causes of crashes are observed to be Failed to Yield Right of Way, Driver Inattention, and Other Improper Driving.
- Copper Ave and Madeira Dr Intersection:
    - For the years 2015 to 2019, 1 crash was reported.
    - The crash was classified as Missing Data and as Property Damage Only.

SUMMARY OF RECOMMENDATIONS

A brief summary of the proposed recommendations is as follows:

- San Mateo Blvd & Copper Ave: It is recommended that the signal be re-timed upon opening of the full development to better accommodate shifting traffic patterns.
- San Mateo Blvd & Central Ave: It is recommended that the signal be re-timed upon opening of the full development to better accommodate shifting traffic patterns.
- San Mateo Blvd and North Driveway
    - It is recommended that a right turn auxiliary lane be constructed. Recommended lengths can be found in the body of this report.
- San Mateo Blvd and South Driveway
    - It is recommended that a right turn auxiliary lane be constructed. Recommended lengths can be found in the body of this report.