Guthrie Pericles, LLC

Marlborough Drive Warehouse Project

Burrowing Owl Focused Surveys

August 2017

Environmental Scientists Planners Engineers

BURROWING OWL FOCUSED SURVEYS

MARLBOROUGH DRIVE WAREHOUSE PROJECT
CITY OF RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

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Rincon Consultants, Inc.

2017 *Burrowing Owl Focused Surveys – Marlborough Drive Warehouse Project, City of Riverside, Riverside County, California.* Rincon Consultants Project No. 17-03907.

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1.0 INTRODUCTION

This report documents the findings of a habitat assessment and focused surveys for western burrowing owl (*Athene cunicularia hypugea*; BUOW) for the proposed Marlborough Avenue Warehouse Development Project. The proposed project is located within the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP), Cities of Riverside and Norco Area Plan per Riverside County Integrated Project (RCIP) Conservation Summary Report (Riverside County Land Information System 2014), the MSHCP identifies this area as requiring habitat assessments for western BUOW.

1.1 PROJECT LOCATION

The project site is generally located within the City of Riverside, west of the terminus of Marlborough Avenue and south of the terminus of Research Park Drive, at the foot of the western portion of the Box Springs Mountains. Land use immediately adjacent to the property includes industrial development to the north and east, and open space to the west and south (Figure 1). Specifically, the site is located at 750 Marlborough Avenue and is approximately 22.5 acres. It is located on Assessor's Parcel Numbers 257-060-002, 257-030-042, and 257-030-016. The parcel is depicted on the Riverside East in Township 2 South, Range 4 West, Section 17 of the U.S. Geological Survey (USGS) *Guasti, California* 7.5-minute topographic quadrangle (Figure 2).

1.2 PROJECT DESCRIPTION

The proposed project involves the construction and operation of a new 339,510 square foot industrial warehouse building with a 6,820 square foot office area totaling 346,330 square feet (sq. ft.) with an additional 86,698 sq. ft. dedicated to a parking lot and landscaping. The total project footprint will also include the installation of a water quality basin to capture on site run-off. One cemented culvert that runs east-west across the site will be removed and redirected underground. Primary vehicular access to the project site would be provided by an entrance located at the end of Marlborough Avenue, on the eastern border of the site. An additional entrance is located at the norther border of the site at the Research Park Drive cul-de-sac. Utilities such as a sewer line, water line, electricity, and a telephone line will be installed several feet underneath the Gage Canal where it meets the terminus of Marlborough Avenue. The northeastern most portion of the project site is not slated for development but will be used as a temporary laydown area during construction.

Figure 1: Regional Location

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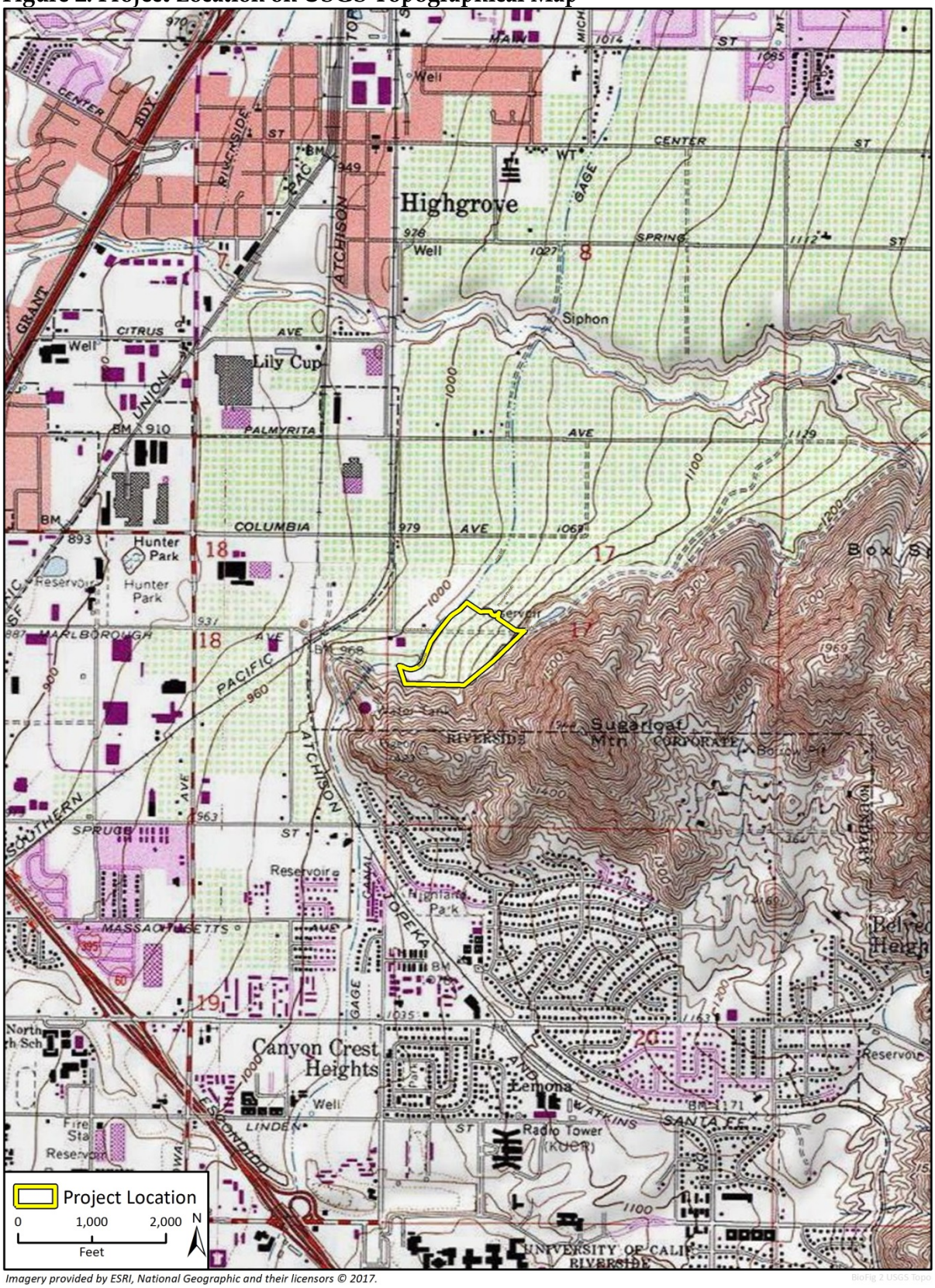
Project Location

0 1,000 2,000

Feet

N

Figure 2: Project Location on USGS Topographical Map



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BioFig 2 USGS Topo

2.0 BACKGROUND

2.1 MSHCP REQUIREMENTS

The MSHCP is a comprehensive, multi-jurisdictional habitat conservation plan focusing on conservation of species and their associated habitats in western Riverside County. According to the MSHCP, surveys for the BUOW are to be conducted as part of the environmental review process. The MSHCP Additional Surveys Needs and Procedures (Section 6.3.2) identifies specific BUOW survey areas within the MSHCP Plan Area (BUOW Survey Area Map, Figure 6-4 of the MSHCP, Volume I). The MSHCP also identifies species-specific objectives for the BUOW surveys if suitable habitat occurs on a proposed project site.

Under the MSHCP, "if a site (including adjacent buffer areas) supports three or more pairs of BUOWs, supports greater than 35 acres of suitable habitat, and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and BUOW pairs will be conserved onsite." If it is determined that the 90 percent threshold cannot be met, the permittee(s) must submit a Determination of Biologically Equivalent or Superior Preservation (DBESP) to provide information on how the proposed plan would protect the nesting owls.

2.2 WESTERN BUOW

2.2.1 Biology

The BUOW is a small (less than 12 inches tall), long-legged owl with a short tail and a wing span of approximately 20-24 inches. They are mostly brown with numerous white or tan spots on the head, with white eyebrows just above bright yellow eyes. The chest and abdomen are white with variable brown spotting or barring, depending on the subspecies. Males and females are similar in size and appearance, and display little sexual dimorphism. Juvenile owls are similar in appearance to adults, but they lack most of the white spotting above and brown barring below.

Unlike most owls, BUOWs are often active during the day, although they tend to avoid the midday heat. However, like many other kinds of owls, BUOWs do most of their hunting from dusk until dawn. BUOWs perch during daylight at the entrance to their burrow or on low posts.

Nesting occurs from March through August. BUOWs form a pair-bond for more than one year and exhibit high site fidelity, reusing the same burrow year after year (Haug et al. 1993). The female remains inside the burrow during most of the egg laying and incubation period and is fed by the male throughout brooding. BUOWs are opportunistic feeders, consuming a diet that includes arthropods, small mammals, and birds, and occasionally amphibians and reptiles.

2.2.2 Habitat Description and Range

BUOWs use a variety of natural and modified habitats for nesting and foraging that is typically characterized by low growing vegetation. BUOW habitat includes, but is not limited to, native and non-native grassland, interstitial grassland within shrub lands, and shrub lands with low density shrub cover.

BUOWs typically use burrows made by fossorial mammals, such as squirrels, badgers, coyotes, fox, and even turtles or tortoises. These are burrows usually found in dry, level, open terrain such as prairie, plains, desert, and grassland, shrub lands with low height vegetation, golf-courses, drainage ditches, earthen berms, unpaved airfields, pastureland, dairies, fallow fields, and agricultural use areas. The abundance of available burrows seems to be a critical habitat requirement. Favored locations are those in relatively sandy sites (presumably for ease of modification and drainage), areas with low vegetation around the burrows (to facilitate the owl's view and hunting success), holes at the bottom of vertical cuts with a slight downward slope from the entrance and slightly elevated locations to avoid flooding; and areas with available perches such as fences, utility poles, posts, or even raised rodent mounds located nearby.

There are two subspecies of BUOW in North America. The western BUOW (*A. c. hypugaea*) is primarily restricted to the western United States and Mexico and was once abundant and widely distributed within coastal southern California. It has declined in counties such as Los Angeles, Orange, San Diego, Riverside, and San Bernardino. Urbanization has greatly reduced the amount of suitable habitat for this species. Other contributions to the decline of BUOWs include the poisoning of squirrels and prairie dogs, collisions with automobiles, and shooting.

2.2.3 Legal Status and Protection

The BUOW is federally protected by the Migratory Bird Treaty Act in the United States and are considered by the U.S. Fish and Wildlife Service (USFWS) to be a Bird of Conservation Concern at the national level, in three USFWS regions, and in nine Bird Conservation Regions. At the state level, BUOWs are a Species of Concern in California.

3.0 METHODOLOGY

3.1 LITERATURE REVIEW

Prior to the field visit, a literature review was conducted to better characterize the nature and extent of effects to potentially suitable BUOW habitat and BUOW individuals on site. The literature review included a review of readily available literature regarding BUOW and a literature review of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB), to determine the closest recorded species locations. Site plans provided by the client, aerial photographs, topographic maps, and soil survey maps were also examined. Specific literature reviewed for the subject analysis is provided in the reference section of this document.

3.2 FOCUSED SURVEYS

The survey for the western BUOW was conducted following the *BUOW Survey Instructions for the Western Riverside MSHCP*, dated March 2006. Surveys were conducted during weather conducive to observing owls outside their burrows and detecting BUOW sign. Surveys were not conducted during rain, high winds (> 20 mph), dense fog, or temperatures over 90 °F.

3.2.1 Habitat Assessment and Focused Burrow Survey

The survey for potential burrows and BUOW sign was conducted by walking through suitable habitat throughout the survey area. The specific survey area included the project parcels and a 500-foot buffer to account for adjacent burrows and foraging habitat outside the project site and impacts from factors such as noise and vibration due to heavy equipment, which could indirectly affect BUOW during project construction. Pedestrian survey transects were spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines were no more than 100 feet and when necessary were reduced to account for differences in terrain, vegetation density, and ground surface visibility. All suitable burrows were thoroughly examined for presence of sign and suitable perches were inspected for BUOW pellets and whitewash. Areas of particular interest included all topographic relief, areas characterized by low growing vegetation, grasslands, shrub lands with low density shrub cover, earthen berms, and any large debris or rock piles. Burrow openings large enough to provide entry for BUOWs were carefully checked for prey remains, cast pellets, white-wash, feathers, or any other indication of BUOW presence. Potential burrows, BUOW individuals and/or sign (if observed) were recorded and mapped using GPS coordinates.

3.2.2 Crepuscular BUOW Surveys

Following the results of the habitat assessment and focused burrow survey, four additional crepuscular BUOW surveys were conducted within the suitable habitat areas. Only areas identified in the initial survey as having potential burrows and adjacent foraging habitats for owls were surveyed during the four crepuscular surveys. Crepuscular surveys were conducted in the morning one hour before sunrise to two hours after sunrise or in the early evening two hours before sunset to one hour after sunset. Four surveys were conducted on four separate days during the nesting season (March through August). Upon arrival at the survey area and prior to initiating the pedestrian surveys, the surveyors scanned all suitable habitats, location of mapped burrows, owl sign and owls, including perch locations using binoculars to ascertain owl presence. A survey for owls and owl sign was then conducted by visiting potential burrows mapped during the focused burrow survey.

4.0 EXISTING CONDITIONS

4.1 ENVIRONMENTAL SETTING

The project site is located in the City of Riverside, within Riverside County, California. At an elevation range of approximately 1000 to 1200 feet above mean sea level, the topography of the

project site is characterized by flat, disturbed ruderal (non-native) vegetation. The climate of the region is classified as Mediterranean: generally dry in the summer with mild, wet winters. The average annual rainfall in the region is about 11 inches, most of it occurring between November and March.

4.2 GENERAL LAND USES AND CONDITION

The site is undeveloped and generally consists of disturbed areas with patches of native vegetation. The vegetation is generally comprised of a mosaic of various non-native ruderal (weedy) species. The ground is further disturbed by routine discing of the soil. A cement-lined culvert traverses directly east-west through the site and will eventually divert water on site into a new detention basin. No riparian habitat exists within the cement lined drainage. Habitat on the project site is low in quality.

Based on the most recent soil survey for Riverside County (United States Department of Agriculture, natural Resources Conservation Service 2015b), the site consists primarily of four mapped soil types: Arlington fine sandy loam, deep, 8 to 15 percent slopes (AoD), Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded (CkF2), Fallbrook sandy loam, 15 to 25 percent slopes, eroded (FaE2), and Hanford coarse sandy loam, 8 to 15 percent slopes, eroded (HcD2). Vegetation communities and soils are described in more detail in Section 3 of the *MSHCP Consistency Analysis and Habitat Assessment* (Rincon 2017a).

Land use immediately adjacent to the project site includes industrial development to the north and east. Box Springs Mountain Reserve is located to the south and west.

5.0 SURVEY RESULTS

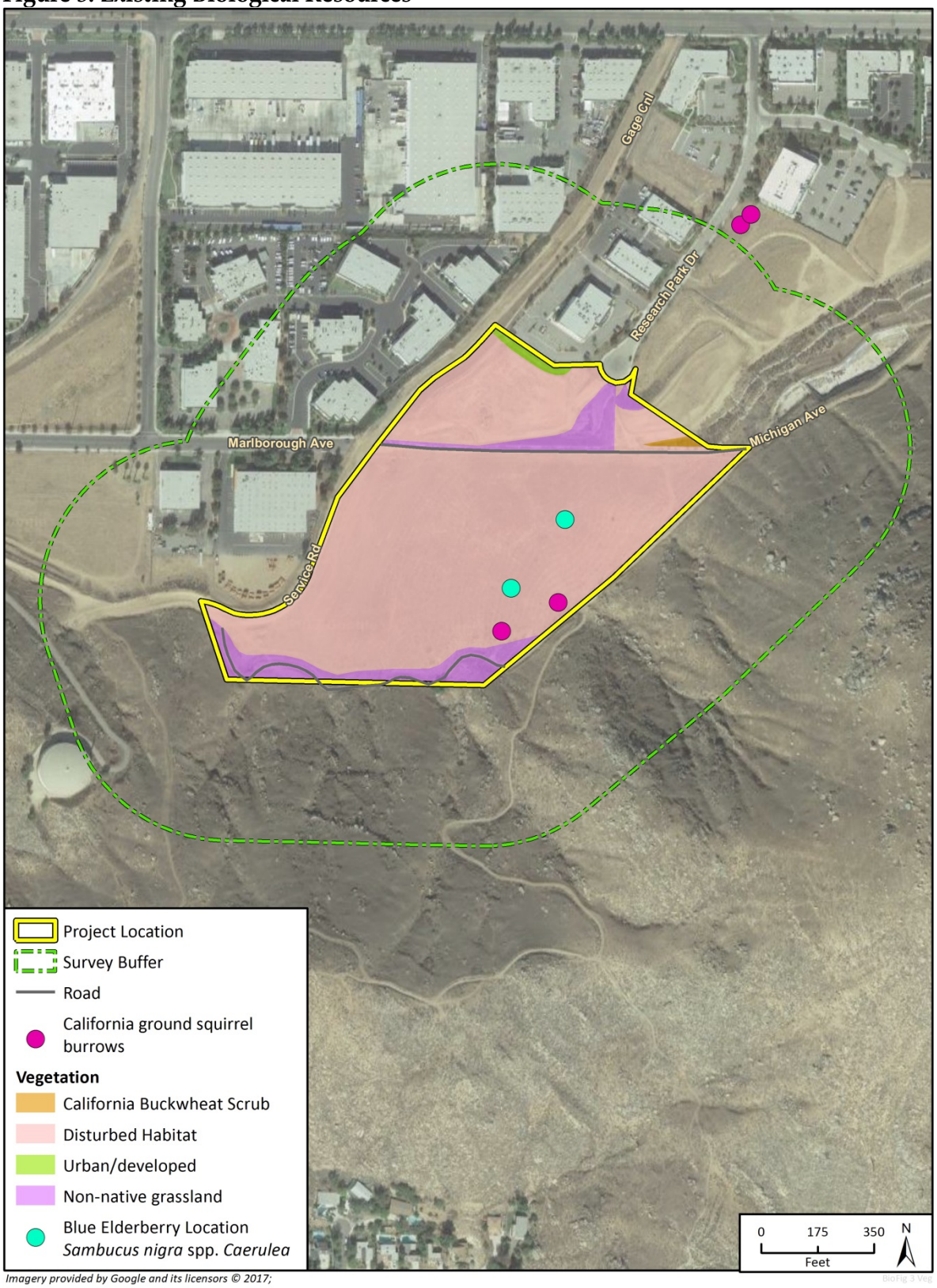
5.1 BUOW HABITAT ASSESSMENT

The BUOW habitat assessment was conducted by Rincon biologist, Lily Sam, on May 4, 2017, between the hours of 1700 and 1900. Survey conditions included temperatures ranging from 90-88^0 F with clear skies and calm winds. The survey area consisted of the area within the proposed limits of work (22.5-acre project site) and an additional 500-foot buffer. The biologist surveyed the project site on foot. Where portions of the survey area were inaccessible on foot (e.g., steep hills), the biologist visually inspected these areas with binoculars (8 x 40) and a spotting scope. There had been no recorded rain in the region for a minimum of 7 days prior to initiating the BUOW habitat assessment survey.

The survey area contains elements of suitable habitat for BUOW, including flat, open areas occupied by non-native herbs and grasses, manmade concrete and cement structures, and urban/developed areas. Two potential BUOW burrows were identified within APN 257-060-002, and two potential burrows were identified within the 500-foot buffer. The additional two burrows were located outside the parcel boundary within a vacant lot located just north of the project site (Figure 3). The project site has been disturbed due to grubbing and disking activities and is surrounded by steep slopes. No burrows with burrowing owl sign (i.e. scat, pellets, and

white wash) were observed during the habitat assessment. California ground squirrels (*Otospermophilus beecheyi*) were observed entering and exiting the burrows. The presence of burrowing owls was not detected. Figure 3 shows the suitable BUOW burrows that were identified.

Figure 3. Existing Biological Resources



5.2 CREPUSCULAR BUOW SURVEYS

Rincon biologists focused on portions of the survey area identified during the focused burrow survey that contained potential habitat. The four focused BUOW surveys were conducted on May 4, August 1, August 10, and August 16, 2017. No BUOWs, or evidence of BUOWs, were observed during the BUOW survey. The weather data and results of each focused BUOW survey are summarized in Table 1 below.

Table 1: Survey Dates, Times, and Conditions

Survey Number	Date	Time	Staff	Conditions
1	05-04-17	1700-1900	Lily Sam	Approximately 90 °F (beginning of survey) to 88 °F (end of survey); clear, wind 0-3 mph.
2	08-01-17	0545-0730	Lily Sam Courtney Aiken	Approximately 78 °F (beginning of survey) to 90 °F (end of survey); 100% cloud cover, wind 5-8 mph, scattered thunder showers. NOTE: sporadic rain fell before the survey occurred; however, the rain was not heavy enough to affect the detection of potential BUOW sign. The biologist waited until it stopped raining to continue surveying.
3	08-10-17	0600-0830	Lily Sam Brenna Vredeveld	Approximately 69 °F (beginning of survey) to 75 °F (end of survey); clear sky, wind 0-3 mph.
4	08-16-17	0600-0800	Lily Sam Courtney Aiken	Approximately 64 °F (beginning of survey) to 66 °F (end of survey); overcast, wind 1-2 mph.

Common avian species expected to occur in suburban environments were observed and outlined in the table below:

Table 2. Avian Species Observed During the Crepuscular Surveys on August 1, 10, & 16, 2017

Scientific Name	Common Name
Calypte anna	Anna's hummingbird
Corvus corax	common raven
Haemorhous mexicanus	house finch
Hirundo rustica	barn swallow
Mimus polyglottos	northern mockingbird
Melozone crissalis	California towhee
Catherpes mexicanus	canyon wren
Falco sparverius	American kestrel
Psaltriparus minimus	bushtit
Buteo jamaicensis	red-tailed hawk
Spinus psaltria	lesser goldfinch
Zenaida macroura	mourning dove
Icterus bullockii	bullock's oriole

In addition, several California ground squirrel (*Otospermophilus beecheyi*) and desert cottontail (*Sylvilagus audubonii*) were observed during all three surveys.

6.0 CONCLUSIONS AND RECOMMENDATIONS

No BUOW or sign of BUOW was observed within the survey area or buffer during the focused BUOW surveys. Therefore, BUOW is currently considered absent from the project site and buffer area. However, with suitable habitat present within the project site there is potential for BUOW to move onto the site during winter migration or during the next nesting season. Per Objective 6 of the MSHCP BUOW Species Account, to avoid direct mortality of any owls that may be using habitat within the impact area, a 30-day pre-construction survey should be conducted prior to ground disturbing activities.

The pre-construction survey should be conducted by a qualified biologist within the development footprint and a 150 meter (500-foot) buffer within 30 days of grading or other significant site disturbance.

If owls are not occupying habitat within the disturbance area during the pre-construction survey, the proposed disturbance activities may proceed. A burrow is considered occupied when there is confirmed use by BUOW. In the event that owls are discovered and may be affected by the proposed project, avoidance measures should be developed in compliance with the MSHCP and in coordination with the CDFW and/or Western Riverside County RCA.

7.0 LIMITATIONS, ASSUMPTIONS, AND USE RELIANCE

This BUOW habitat assessment and protocol surveys have been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The biological investigation is limited by the scope of work performed. In addition, general biological (or protocol) surveys do not guarantee that BUOW are not present and will not be discovered in the future within the site. In particular, BUOW are mobile species and could occupy the site on a transient basis, or re-establish populations in the future. Our field studies were based on current industry practices, which change over time and may not be applicable in the future. No other guarantees or warranties, expressed or implied, are provided. The findings and opinions conveyed in this report are based on findings derived from site reconnaissance, review of CNDDB, and specified historical and literature sources. Standard data sources relied upon during the completion of this report, such as the CNDDB, may vary with regard to accuracy and completeness. In particular, the CNDDB is compiled from research and observations reported to CDFW that may or may not have been the result of comprehensive or site-specific field surveys. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it has used. Additionally, pursuant to our contract, the data sources reviewed included only those that are practically reviewable without the need for extraordinary research and analysis.

8.0 REFERENCES

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9.0 CERTIFICATION AND LIST OF PREPARERS

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: 8/29/17 Signed: _____

Courtney Aiken, Associate Biologist

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  - Lily Sam, Biologist
  - Brenna Vredeveld, Senior Biologist
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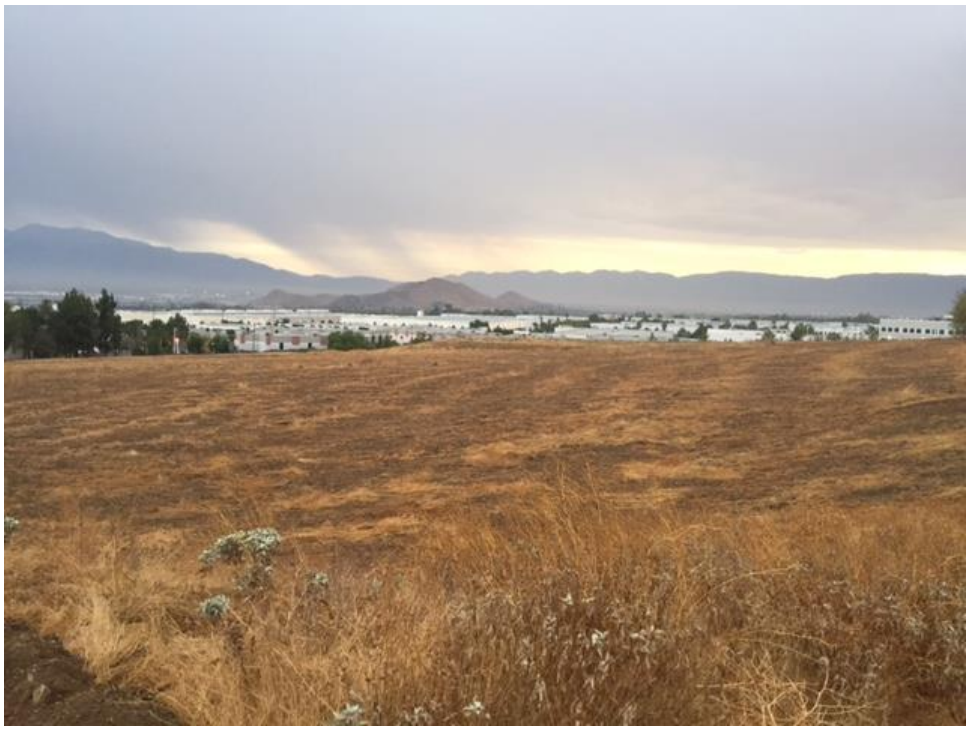
Appendix A

Site Photographs

Photograph 1. View of suitable BUOW burrow located just outside of the project site. Several ground squirrels were seen entering and exiting the burrows. The surrounding industrial park can be seen in the background.

Photograph 2. View of project site in the foreground and surrounding habitat (Box Springs Mountain Reserve) in the background (west and south of the site).

Photograph 3. View of the proposed temporary laydown area not slated for development (northeast portion of the site).



Photograph 4. View of suitable BUOW habitat within the project site including open, flat land with several ground squirrel burrows. Surrounding industrial park in the background (north and east of site).

MARLBOROUGH INDUSTRIAL PROJECT
TRAFFIC IMPACT ANALYSIS

January 4, 2018

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MARLBOROUGH INDUSTRIAL PROJECT
TRAFFIC IMPACT ANALYSIS

January 4, 2018

INTRODUCTION

The following Traffic Impact Analysis (TIA) has been prepared to determine any traffic-related impacts within the project area roadways and intersections due to the proposed Marlborough Industrial Project. The proposed project is located on the east end of Marlborough Avenue and the south end of Research Park Drive in the City of Riverside. **Exhibit 1** shows the project area map.

This TIA was prepared following the City of Riverside Transportation Department *Traffic Impact Analysis Preparation Guide* publication, dated January, 2016. Refer to **Appendix A** for the Scoping Agreement.

PROJECT DESCRIPTION

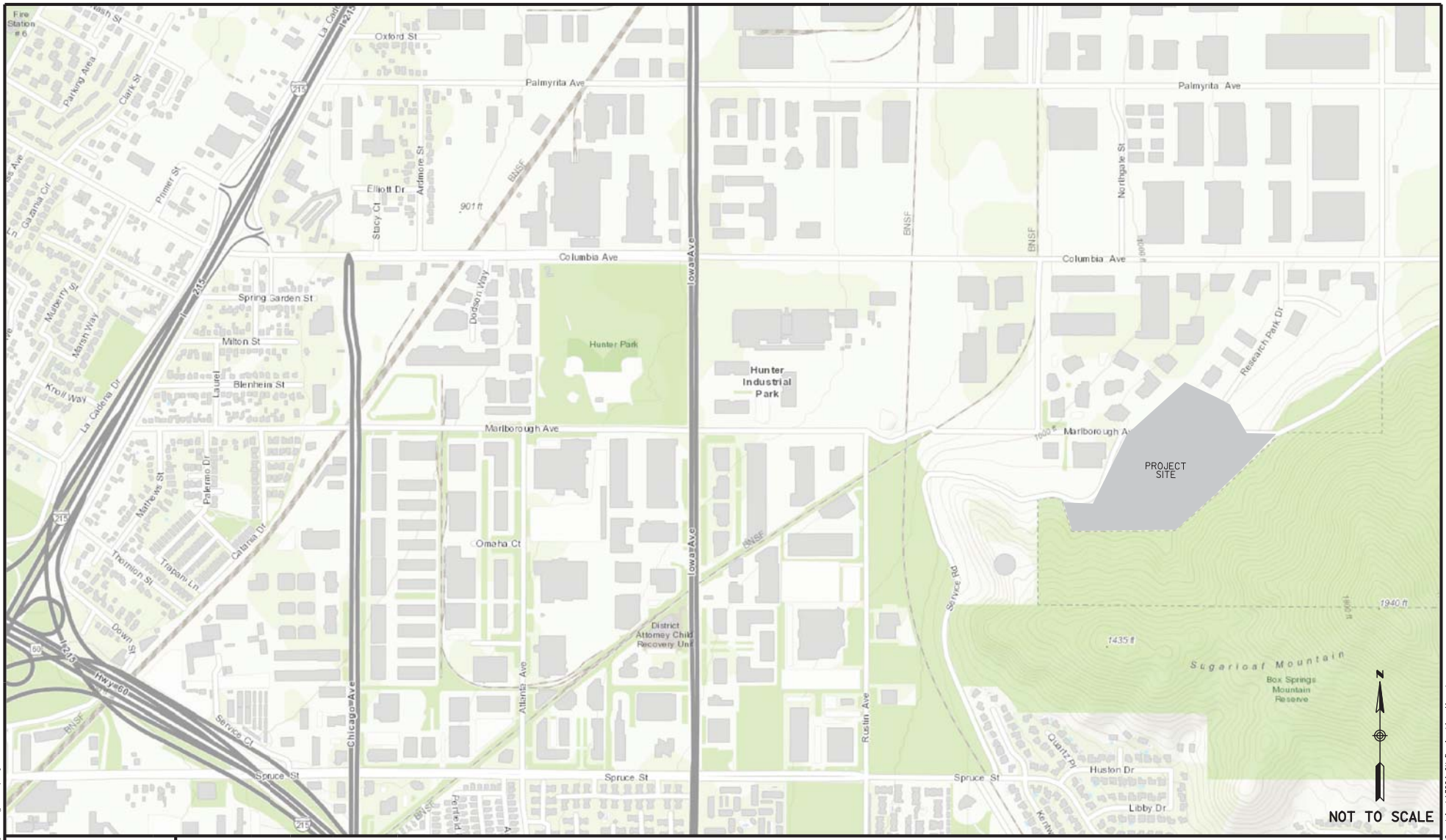
The project involves the construction of 339,510 square feet of industrial/manufacturing space with 6,820 square feet of office space. There are two vehicular access points to the project site, one driveway via Marlborough Avenue and the second driveway via Research Park Drive. The project will construct approximately 281 parking spaces on the site to accommodate customers/employees. **Exhibit 2** shows the project site plan.

EXISTING TRANSPORTATION CONDITIONS

The following is a brief description of the City of Riverside roadways within the project area.

Marlborough Avenue is classified as an 88' Arterial between Chicago Avenue and Rustin Avenue and as an 80' Collector between Rustin Avenue and Northgate Street per the City of Riverside's Circulation Element. Within the project area, it currently provides one vehicular travel lane in each direction. On-street parking is only permitted between Chicago Avenue and Atlanta Avenue. Bike lanes are provided between Iowa Avenue and Northgate Street within the project area. Sidewalk is provided on the north side of the roadway throughout the majority of the study area, the south side provides a segment east of Atlanta and another segment between Rustin Avenue and Northgate Street. A traffic signal is provided at its intersection with Iowa Avenue. The posted speed limit is 35 mph.

Columbia Avenue is classified as an 88' Arterial between Primer Street and W La Cadena Drive, as a 100' Arterial between E La Cadena Drive and Chicago Avenue and as a 110' Arterial between Iowa Avenue and Michigan Avenue per the City of Riverside's Circulation Element. Within the project area it currently provides 3 vehicular travel lanes in each direction between E La Cadena Drive and Chicago Avenue and two vehicular travel lanes in each direction between Chicago Avenue and Michigan Avenue with a raised median between Iowa Avenue and Northgate Street and a two-way left-turn lane between Northgate Street and Michigan Avenue. On-street parking is not permitted and dedicated bike lanes are provided along both sides of the roadway within the project area. Sidewalk is provided on both sides of the roadway throughout the study area with the exception of segments on



RICK ENGINEERING COMPANY

EXHIBIT 1

PROJECT AREA MAP

MARLBOROUGH INDUSTRIAL PROJECT

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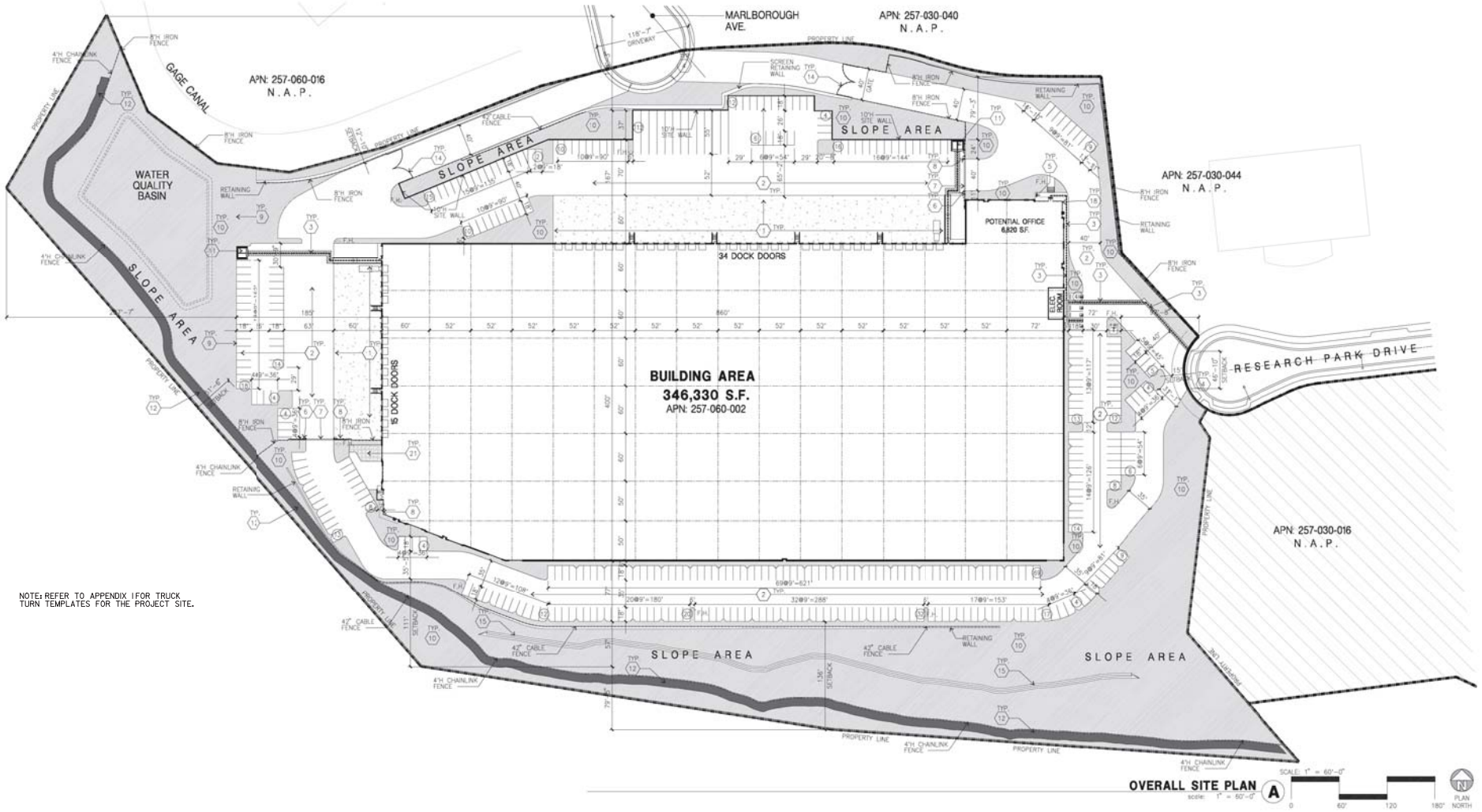

RICK ENGINEERING COMPANY

EXHIBIT 2

PROJECT SITE PLAN

MARLBOROUGH INDUSTRIAL PROJECT

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the north side of the roadway between Primer Street and E La Cadena Drive and between Chicago Avenue and Iowa Avenue. A traffic signal is provided at its intersection with Primer Street, E La Cadena Drive, Chicago Avenue and Iowa Avenue. The posted speed limit is 45 mph.

Chicago Avenue is classified as an Arterial roadway between Columbia Avenue and Marlborough Avenue per the City of Riverside's Circulation Element. Within the project area, it currently provides two vehicular travel lanes in each direction with a raised median. On-street parking is not permitted and bike lanes are provided along both sides of the roadway within the project area. Sidewalk is provided on both sides of the roadway form Columbia Avenue to Marlborough Avenue and only on the west side of the roadway south of Marlborough Avenue. A traffic signal is provided at its intersection with Columbia Avenue. The posted speed limit is 40 mph.

Iowa Avenue is classified as a 120' Arterial between Columbia Avenue and Marlborough Avenue per the City of Riverside's Circulation Element. Within the project area, it currently provides two vehicular travel lanes in each direction. On-street parking is not permitted. Bike lanes are provided between along both sides of the roadway within the project area. Sidewalk is provided on both sides of the roadway between Columbia Avenue and Marlborough Avenue including a scenic pedestrian pathway on the east side of the roadway. A traffic signal is provided at its intersection with Columbia Avenue and Marlborough Avenue. The posted speed limit is 50 mph.

Northgate Street is classified as a 66' Collector roadway between Columbia Avenue and Marlborough Avenue per the City of Riverside's Circulation Element. Within the project area, it currently provides one vehicular travel lane in each direction. On-street parking is permitted along both sides of the roadway. Bike lanes are not provided within the project area. Sidewalk is provided on the east side of the roadway between Columbia Avenue and Marlborough Avenue. There is no posted speed limit.

Research Park Drive is unclassified in the City of Riverside's Circulation Element is it assumed to function as a Local Street. Within the project area, it currently provides one vehicular travel lane in each direction. On-street parking is permitted on both sides of the roadway. Bike lanes are not provided within the project area. Sidewalk is provided on both sides of the roadway south of Columbia Avenue. There is no posted speed limit.

Michigan Avenue is classified as a 66' Collector between Marlborough Avenue and Palmyrita Avenue per the City of Riverside's Circulation Element. Within the project area, it currently provides one vehicular travel lane in each direction. On-street parking is permitted along the both sides of the roadway. Bike lanes are not provided within the project area. Sidewalk is provided on both sides of the roadway between Palmyrita Avenue and Columbia Avenue. There is no posted speed limit.

Transit services provided by the Riverside Transit Agency include three bus routes through the study area and a metrolink station as described below:

Route 13
Through the study area this route runs north on Chicago Avenue, then east on Marlborough Avenue, makes a stop at the Hunter Park Metrolink Station then south on Rustin Avenue.

Route 14
Though the study area this route runs north and south on Iowa Avenue.

Route 52
Through the study area this route runs north on Iowa Avenue, then east on Marlborough Avenue, makes a stop at the Hunter Park Metrolink Station then south on Rustin Avenue.

Hunter Park Metrolink Station is located on Marlborough Avenue just east of Rustin Avenue and provides commuters with a rail connection from LA Union Station in the north to Downtown Perris in the south.

Exhibit 3 shows the existing transportation conditions within the project area. The City of Riverside Circulation Element is included in **Appendix B**.

EXISTING TRAFFIC VOLUMES

Existing traffic volumes at the project area intersections were obtained from traffic counts conducted by Field Data Services of Arizona May 17-18, 2017. The turning movement counts were conducted during the weekday AM (7:00-9:00) and PM (4:00-6:00) peak periods. Additionally, 24-hour tube counts were also conducted May 17-18, 2017. It should be noted that count sheet discrepancies can occur when observed peak hour periods are different between adjacent intersections. If these discrepancies occurred, the traffic volumes were balanced to accurately reflect existing traffic volumes. **Exhibit 4** shows the existing intersection turning movement counts and ADT's within the study area. **Appendix C** contains the manual turning movement count sheets at the study intersections, daily roadway segment counts and the excel sheet used to balance existing volumes.

TRAFFIC ANALYSIS METHODOLOGY

The intersections and roadways within the project area were analyzed for the following scenarios:

- Existing Traffic Conditions (Year 2017)
- Existing + Ambient Traffic Conditions (Year 2018)
- Existing + Project Traffic Conditions (Year 2018)
- Existing + Ambient + Project Traffic Conditions (Year 2018)
- Existing + Ambient + Project + Cumulative Conditions (Year 2018)

The level of service for signalized intersections was calculated using the methodologies described in Chapter 18 of the 2010 Highway Capacity Manual (HCM). The level of service for signalized intersections is defined in terms of control delay, which is made up of a number of factors that relate to right-of-way control, geometrics and traffic volumes. The signalized intersection analysis also takes into account intersection spacing and coordination.

The level of service for un-signalized intersections was calculated using the methodologies described in Chapter 19 of the 2010 HCM. The level of service for a two-way stop-controlled intersection is determined by the computed control delay for each minor street movement and major street left turns, and not for the intersection as a whole. All-way stop-controlled interaction operations are reported for the intersection as a whole as described in Chapter 20 of the 2010 HCM.

Level of Service A through D is considered acceptable for peak hour intersection operations. The project area intersections were analyzed during the AM and PM peak hours. The intersection Synchro report sheets are contained in **Appendix D**.

The LOS for roadway segment operations was calculated based on volume to capacity ratios. LOS A through D is considered acceptable for roadway segments when compared against the City of Riverside's Roadway Capacity Exhibit D, in the City of Riverside's Traffic Impact Analysis Preparation Guide.

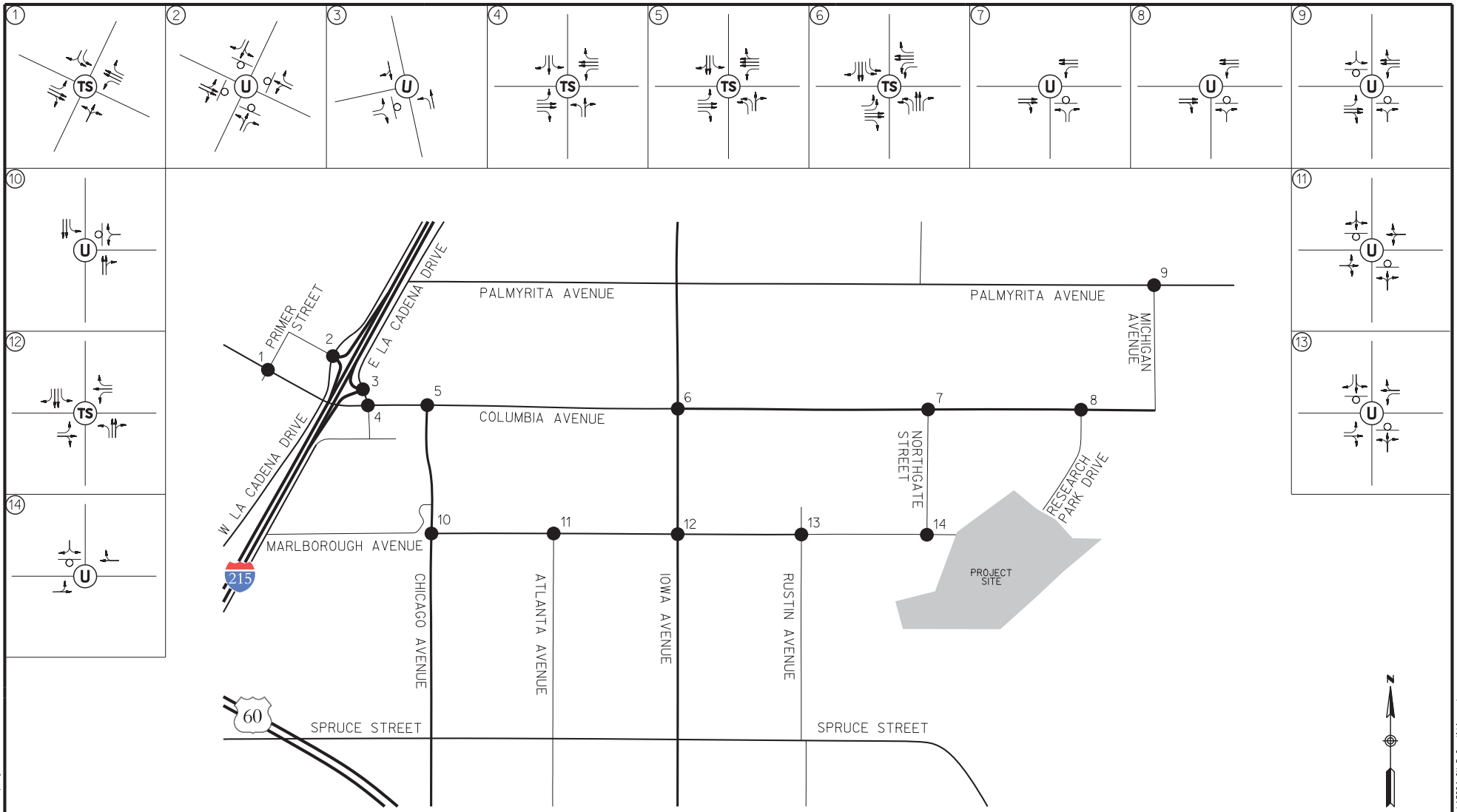

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EXHIBIT 3

EXISTING TRANSPORTATION CONDITIONS (2017)

MARLBOROUGH INDUSTRIAL PROJECT

LEGEND

TS =TRAFFIC SIGNAL

U =UNSIGNALIZED

=STOP CONTROLLED

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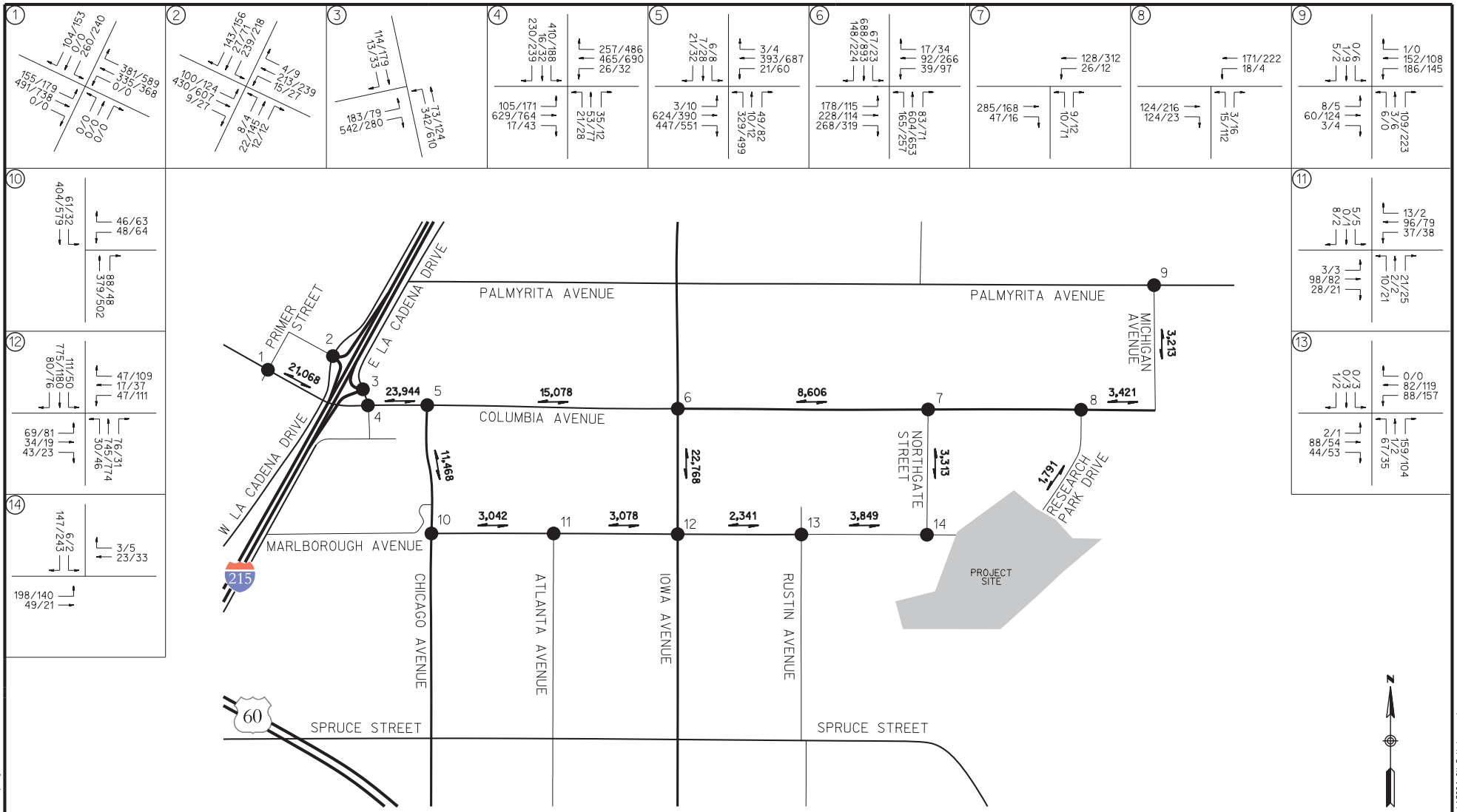

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EXHIBIT 4

EXISTING TRAFFIC VOLUMES (2017)

MARLBOROUGH INDUSTRIAL PROJECT

LEGEND

XXX/XXX =AM/PM PEAK HOUR

X,XXX =AVERAGE DAILY TRAFFIC VOLUME

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Due to this project's proposed industrial/warehouse classification, the vehicle mix was determined from in the City of Fontana's Truck Trip Generation Study (2003). This study was used to help determine the impact of truck traffic on the circulation system. An exhibit of the total project truck traffic and its vehicle mix percentages provided expected distribution onto the existing road network was included as part of the scoping agreement. The scoping agreement and the attached truck traffic exhibit can be found in **Appendix A**. It should be noted that the truck traffic volumes were used to calculate heavy vehicle percentages which were inputted into the synchro software parameters in order to analyze the project intersections.

EXISTING OPERATIONS

Exhibit 4 shows the existing traffic volumes, as encountered during the traffic counts performed on May 17-18, 2017.

Signalized Intersections

The 5 signalized intersections within the study area are:

- Columbia Avenue / Primer Street
- Columbia Avenue / E La Cadena Drive
- Columbia Avenue / Chicago Street
- Columbia Avenue / Iowa Avenue
- Marlborough Avenue / Iowa Avenue

Table 1 shows that all of the project area signalized intersections currently operate at LOS D or better during the AM and PM peak hour.

Un-signalized Intersections

The 9 un-signalized intersections within the study area are:

- Interchange Street / W La Cadena Drive / I-215 SB Ramps
- I-215 NB Ramps / E La Cadena Drive
- Columbia Avenue / Northgate Street
- Columbia Avenue / Research Park Drive
- Palmyrita Avenue / Michigan Avenue
- Marlborough Avenue / Chicago Avenue
- Marlborough Avenue / Atlanta Avenue
- Marlborough Avenue / Rustin Avenue
- Marlborough Avenue / Northgate Street

Table 1 shows that all of the project area un-signalized intersections currently operate at LOS D or better during the AM and PM peak hour, with the exception of the following:

- Interchange Street / W La Cadena Drive / I-215 SB Ramps – LOS E during PM Peak Hour
- E La Cadena Drive / I-215 NB Ramps – LOS F during AM/PM Peak Hour

Roadway Segments

The 14 roadway segments analyzed within the study area are:

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TABLE 1
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING (2017) INTERSECTION OPERATIONS

INTERSECTION		DELAY	LOS
1 Columbia Avenue / Primer Street (S)			
	AM peak	17.2	B
	PM peak	16.1	B
2 Interchange Street / W La Cadena Drive / I-215 SB Ramps (U)			
	AM peak EBL	18.5	C
	PM peak EBL	**45.8**	**E**
3 E La Cadena Drive / I-215 NB Ramps (U)			
	AM peak EBL	**106.4**	**F**
	PM peak EBL	**365.6**	**F**
4 Columbia Avenue / E La Cadena Drive (S)			
	AM peak	31.0	C
	PM peak	26.0	C
5 Columbia Avenue / Chicago Avenue (S)			
	AM peak	27.7	C
	PM peak	29.3	C
6 Columbia Avenue / Iowa Avenue (S)			
	AM peak	30.6	C
	PM peak	35.4	D
7 Columbia Avenue / Northgate Street (U)			
	AM peak NBL	12.9	B
	PM peak NBL	12.6	B
8 Columbia Avenue / Research Park Drive (U)			
	AM peak NBL	10.5	B
	PM peak NBL	14.4	B

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TABLE 1
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING (2017) INTERSECTION OPERATIONS

INTERSECTION			DELAY	LOS
9 Palmyrita Avenue / Michigan Avenue (U)				
	AM peak			
		SBL	10.4	B
	PM peak			
		SBL	16.7	C
10 Marlborough Avenue / Chicago Avenue (U)				
	AM peak			
		WBL	24.0	C
	PM peak			
		WBL	21.9	C
11 Marlborough Avenue / Atlanta Avenue (U)				
	AM peak			
		NBL	10.3	B
	PM peak			
		NBL	10.7	B
12 Marlborough Avenue / Iowa Avenue (S)				
	AM peak			
			18.7	B
	PM peak			
			22.9	C
13 Marlborough Avenue / Rustin Avenue (U)				
	AM peak			
		NBL	13.0	B
	PM peak			
		NBL	16.9	C
14 Marlborough Avenue / Northgate Street (U)				
	AM peak			
		SBL	10.4	B
	PM peak			
		SBL	9.8	A

- Delays and Level of Service calculated utilizing the methodologies described in Chapters 18 & 19 of the 2010 Highway Capacity Manual (HCM).

DELAY is measured in seconds

LOS = Level of Service

NB = Northbound, SB = Southbound, etc.

T=thru movement, R=right-turn movement, etc.

(S) = Signalized intersection

(U) = Unsignalized intersection

- Columbia Avenue, Primer Street to E La Cadena Drive
- Columbia Avenue, E La Cadena Drive to Chicago Avenue
- Columbia Avenue, Chicago Avenue to Iowa Avenue
- Columbia Avenue, Iowa Avenue to Northgate Street
- Columbia Avenue, Research Park Drive to Michigan Avenue
- Michigan Avenue, Columbia Avenue to Palmyrita Avenue
- Marlborough Avenue, Chicago Avenue to Atlanta Avenue
- Marlborough Avenue, Atlanta Avenue to Iowa Avenue
- Marlborough Avenue, Iowa Avenue to Rustin Avenue
- Marlborough Avenue, Rustin Avenue to Northgate Street
- Chicago Avenue, Marlborough Avenue to Columbia Avenue
- Iowa Avenue, Marlborough Avenue to Columbia Avenue
- Northgate Street, Marlborough Avenue to Columbia Avenue
- Research Park Drive, South of Columbia Avenue

The roadway segment analysis was performed by comparing the Average Daily Traffic (ADT) volumes on each segment analyzed with the traffic volume thresholds contained in the "City of Riverside Roadway Capacity" Exhibit D. The results are summarized on **Table 2**. As shown, all of the segments analyzed currently operate at LOS B or better.

EXISTING + AMBIENT OPERATIONS

To estimate the opening year (2018) ambient/background traffic volumes, the existing traffic volumes were increased 2% to get from 2017 to 2018. This growth rate was provided by the City of Riverside. **Exhibit 5** shows the 2018 existing plus ambient traffic volumes.
Signalized Intersections

Table 3 shows that all project area intersections are anticipated to continue to operate at LOS D or better during the AM and PM peak hours.

Un-signalized Intersections

Table 3 shows that all project area intersections are anticipated to continue to operate at LOS D or better during the AM and PM peak hours, with the exception of the following:

- Interchange Street / W La Cadena Drive / I-215 SB Ramps – LOS E during PM Peak Hour
- E La Cadena Drive / I-215 NB Ramps – LOS F during AM/PM Peak Hour

Roadway Segments

Table 4 shows that all of the roadway segments is anticipated to continue to operate at LOS B or better with the addition the of the (2018) ambient traffic.

PROJECT TRAFFIC GENERATION

Based on the Institute of Transportation Engineer's (ITE's) *Trip Generation* publication (9th edition), the relevant trip generation rates for Manufacturing (ITE Code 140**)** and for General Office (ITE

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TABLE 2
MARLBOROUGH INDUSTRIAL PROJECT
(2017) EXISTING ROADWAY SEGMENT OPERATIONS

	STREET SEGMENT	EXISTING CLASSIFICATION	EXISTING (2017) VOLUME			
			Capacity[a]	ADT	V/C	LOS
1	Columbia Avenue, Primer Street to E La Cadena Drive	100' ARTERIAL	33,000	21,068	0.64	B
2	Columbia Avenue, E La Cadena Drive to Chicago Avenue	110' ARTERIAL	33,000	23,944	0.73	B
3	Columbia Avenue, Chicago Avenue to Iowa Avenue	110' ARTERIAL	33,000	15,078	0.46	A
4	Columbia Avenue, Iowa Avenue to Northgate Street	110' ARTERIAL	33,000	8,606	0.26	A
5	Columbia Avenue, Research Park Drive to Michigan Avenue	100' ARTERIAL	33,000	3,421	0.10	A
6	Michigan Avenue, Columbia Avenue to Palmyrita Avenue	66' COLLECTOR	12,500	3,213	0.26	A
7	Marlborough Avenue, Chicago Avenue to Atlanta Avenue	66' COLLECTOR	12,500	3,042	0.24	A
8	Marlborough Avenue, Atlanta Avenue to Iowa Avenue	66' COLLECTOR	12,500	3,078	0.25	A
9	Marlborough Avenue, Iowa Avenue to Rustin Avenue	66' COLLECTOR	12,500	2,341	0.19	A
10	Marlborough Avenue, Rustin Avenue to Northgate Street	66' COLLECTOR	12,500	3,849	0.31	A
11	Chicago Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	11,468	0.35	A
12	Iowa Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	22,768	0.69	B
13	Northgate Street, Marlborough Avenue to Columbia Avenue	66' COLLECTOR	12,500	3,313	0.27	A
14	Research Park Drive, South of Columbia Avenue	LOCAL	3,100	1,791	0.58	B

Footnote:

a. LOS A and LOS B capacity thresholds were derived; City of Riverside deems anything better than LOS C as acceptable.

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TABLE 3
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT (2018)
INTERSECTION OPERATIONS

INTERSECTION		DELAY	LOS
1 Columbia Avenue / Primer Street (S)			
AM peak		17.2	B
PM peak		20.8	C
2 Interchange Street / W La Cadena Drive / I-215 SB Ramps (U)			
AM peak	EBL	19.2	C
PM peak	EBL	**50.2**	**D**
3 E La Cadena Drive / I-215 NB Ramps (U)			
AM peak	EBL	**122.4**	**F**
PM peak	EBL	**427.4**	**F**
4 Columbia Avenue / E La Cadena Drive (S)			
AM peak		31.3	C
PM peak		26.6	C
5 Columbia Avenue / Chicago Avenue (S)			
AM peak		27.7	C
PM peak		29.3	C
6 Columbia Avenue / Iowa Avenue (S)			
AM peak		31.0	C
PM peak		36.1	D
7 Columbia Avenue / Northgate Street (U)			
AM peak	NBL	13.0	B
PM peak	NBL	12.7	B
8 Columbia Avenue / Research Park Drive (U)			
AM peak	NBL	10.5	B
PM peak	NBL	14.6	B

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TABLE 3
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT (2018)
INTERSECTION OPERATIONS

INTERSECTION			DELAY	LOS
9 Palmyrita Avenue / Michigan Avenue (U)				
	AM peak			
		SBL	10.5	B
	PM peak			
		SBL	17.0	C
10 Marlborough Avenue / Chicago Avenue (U)				
	AM peak			
		WBL	25.2	D
	PM peak			
		WBL	22.9	C
11 Marlborough Avenue / Atlanta Avenue (U)				
	AM peak			
		NBL	10.3	B
	PM peak			
		NBL	10.8	B
12 Marlborough Avenue / Iowa Avenue (S)				
	AM peak			
			19.2	B
	PM peak			
			23.4	C
13 Marlborough Avenue / Rustin Avenue (U)				
	AM peak			
		NBL	13.2	B
	PM peak			
		NBL	17.1	C
14 Marlborough Avenue / Northgate Street (U)				
	AM peak			
		SBL	10.4	B
	PM peak			
		SBL	9.8	A

- Delays and Level of Service calculated utilizing the methodologies described in Chapters 18 & 19 of the 2010 Highway Capacity Manual (HCM).

DELAY is measured in seconds

LOS = Level of Service

NB = Northbound, SB = Southbound, etc.

T=thru movement, R=right-turn movement, etc.

(S) = Signalized intersection

(U) = Unsignalized intersection

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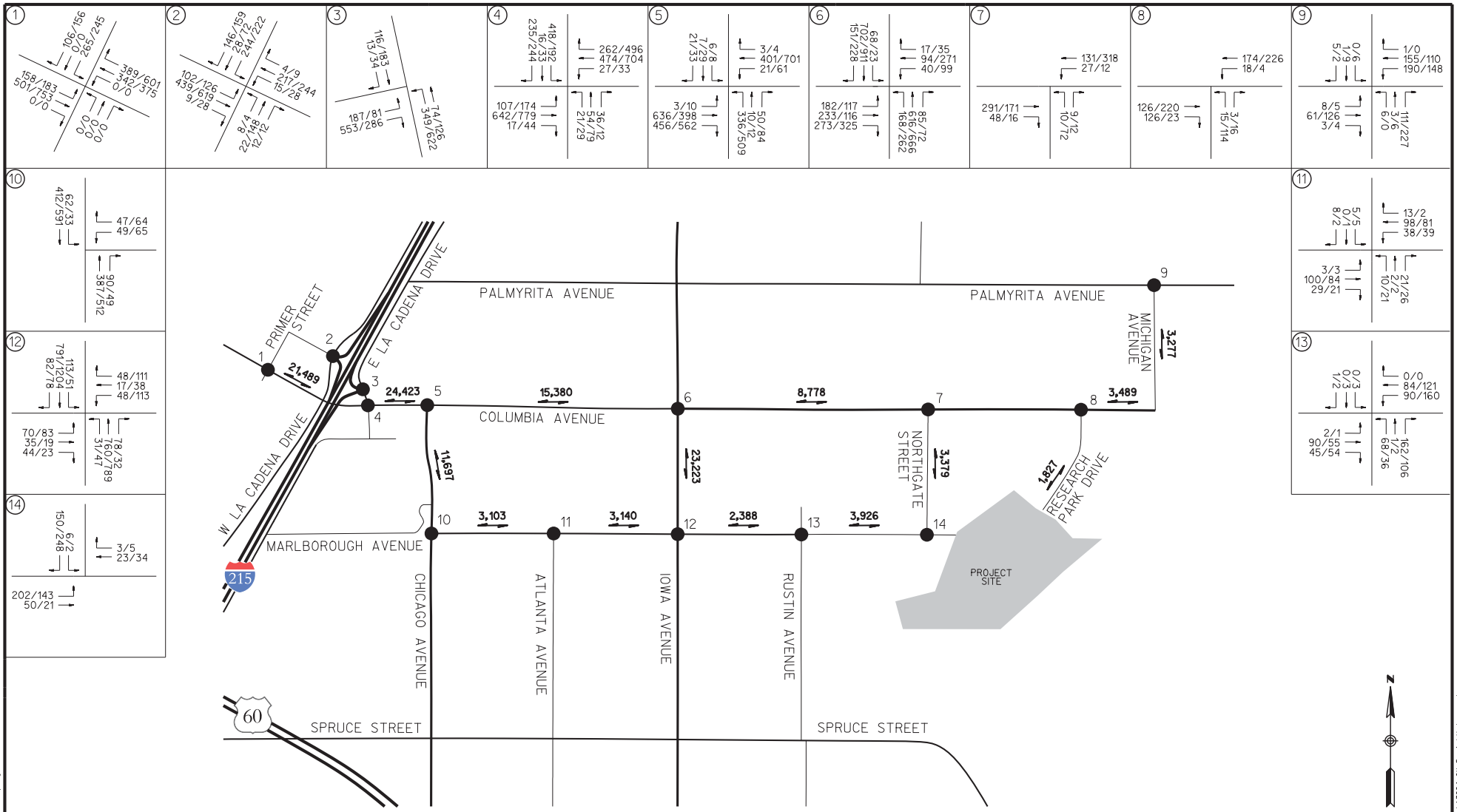
TABLE 4
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT ROADWAY SEGMENT OPERATIONS

	STREET SEGMENT	EXISTING CLASSIFICATION	EX + AMB VOLUME			
			Capacity[a]	ADT	V/C	LOS
1	Columbia Avenue, Primer Street to E La Cadena Drive	100' ARTERIAL	33,000	21,489	0.65	B
2	Columbia Avenue, E La Cadena Drive to Chicago Avenue	110' ARTERIAL	33,000	24,423	0.74	B
3	Columbia Avenue, Chicago Avenue to Iowa Avenue	110' ARTERIAL	33,000	15,380	0.47	A
4	Columbia Avenue, Iowa Avenue to Northgate Street	110' ARTERIAL	33,000	8,778	0.27	A
5	Columbia Avenue, Research Park Drive to Michigan Avenue	100' ARTERIAL	33,000	3,489	0.11	A
6	Michigan Avenue, Columbia Avenue to Palmyrita Avenue	66' COLLECTOR	12,500	3,277	0.26	A
7	Marlborough Avenue, Chicago Avenue to Atlanta Avenue	66' COLLECTOR	12,500	3,103	0.25	A
8	Marlborough Avenue, Atlanta Avenue to Iowa Avenue	66' COLLECTOR	12,500	3,140	0.25	A
9	Marlborough Avenue, Iowa Avenue to Rustin Avenue	66' COLLECTOR	12,500	2,388	0.19	A
10	Marlborough Avenue, Rustin Avenue to Northgate Street	66' COLLECTOR	12,500	3,926	0.31	A
11	Chicago Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	11,697	0.35	A
12	Iowa Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	23,223	0.70	B
13	Northgate Street, Marlborough Avenue to Columbia Avenue	66' COLLECTOR	12,500	3,379	0.27	A
14	Research Park Drive, South of Columbia Avenue	LOCAL	3,100	1,827	0.59	B

Footnote:

a. LOS A and LOS B capacity thresholds were derived; City of Riverside deems anything better than LOS C as acceptable.



NOT TO SCALE

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EXHIBIT 5

EXISTING + AMBIENT VOLUMES

MARLBOROUGH INDUSTRIAL PROJECT

LEGEND

XXX/XXX =AM/PM PEAK HOUR

X,XXX =AVERAGE DAILY TRAFFIC VOLUME

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Code 710) were utilized. The project site is estimated to generate a total of 1,468 new daily trips with 274 trips (216 inbound/58 outbound) during the AM peak hour and 335 trips (105 inbound/230 outbound) during the PM peak hour. **Table 5** shows the project traffic generation for the proposed project. The trip generation calculations are included in **Appendix E**.

PROJECT TRAFFIC DISTRIBUTION/ASSIGNMENT

The traffic distribution for opening year (2018) was estimated based on the site's proximity to the nearby major roadway, existing local traffic patterns and existing traffic counts at the project area intersections.

It should be noted that the distribution takes into consideration the fact that project trips also consist of heavy vehicles coming to and from the project site. No notable observations regarding truck traffic along Spruce to the Blaine Interchange were encountered during the fieldwork done for the project. Although only a minimal amount of truck traffic was observed during the times our field work was being done, and our observations did not specifically tie any of that truck traffic to the project area, a heavy vehicle percentage for turning movements at intersections was derived from the assigned heavy vehicle traffic and applied to the "+ project" scenarios for this study. **Exhibit 6** shows the project distribution percentages utilized for assigning the project trips.

Once this has been established, the project traffic volumes were added to the project area intersections and roadways. **Exhibit 7** shows the project only traffic.

EXISTING + PROJECT OPERATIONS

In order to estimate the traffic volumes at the opening of the proposed project, the calculated project trips were added to the 2018 existing traffic. **Exhibit 8** shows the 2018 total traffic volumes (includes project traffic) within the project study area.

Signalized Intersections

Table 6 shows that all project area intersections are anticipated to continue to operate at LOS D or better during the AM and PM peak hours.

Un-signalized Intersections

Table 6 shows that all project area intersections are anticipated to continue to operate at LOS D or better during the AM and PM peak hours, with the exception of the following:

- Interchange Street / W La Cadena Drive / I-215 SB Ramps – LOS F during PM Peak Hour
- E La Cadena Drive / I-215 NB Ramps – LOS F during AM/PM Peak Hour

Roadway Segments

Table 7 shows that all of the roadway segments are anticipated to continue to operate at LOS B or better with the addition the of the (2018) project traffic.

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TABLE 5
MARLBOROUGH INDUSTRIAL COMPLEX
PROJECT TRIP GENERATION SUMMARY

Land Use	Quantity	Rate	ADT	AM Peak Hour							PM Peak Hour						
				% of ADT	In : Out Split			Volumes			% of ADT	In : Out Split			Volumes		
								In	Out	Total					In	Out	Total
Manufacturing	339,510 SF	0.0038 / KSF	1,297	19%	78%	:	22%	197	55	252	19%	36%	:	64%	90	159	249
General Office	6,820 SF	0.0251 / KSF	171	13%	86%	:	14%	19	3	22	50%	17%	:	83%	15	71	86
TOTAL			**1,468**					**216**	**58**	**274**					**105**	**230**	**335**

-Source: ITE Trip Generation Manual 9th Edition, 2012.

-Per the Truck Trip Generation Study, *City of Fontana* , for the Manufacturing Category, 38.8% of the project trips calculated are to represent truck traffic generated by the project.

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TABLE 6
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + PROJECT (2018)
INTERSECTION OPERATIONS

INTERSECTION		DELAY	LOS	SIGNIFICANT IMPACT	MITIGATION	
					DELAY	LOS
1 Columbia Avenue / Primer Street (S)						
AM peak		18.4	B	-		
PM peak		21.3	C	-		
2 Interchange Street / W La Cadena Drive / I-215 SB Ramps (U)						
AM peak	EBL	22.2	C	-		
PM peak	EBL	**62.0**	**F**	Y	43.6	D
3 E La Cadena Drive / I-215 NB Ramps (U)						
AM peak	EBL	**131.0**	**F**	Y	7.3	A
PM peak	EBL	**648.6**	**F**	Y	7.1	A
4 Columbia Avenue / E La Cadena Drive (S)						
AM peak		32.6	C	-		
PM peak		29.0	C	-		
5 Columbia Avenue / Chicago Avenue (S)						
AM peak		28.1	C	-		
PM peak		29.8	C	-		
6 Columbia Avenue / Iowa Avenue (S)						
AM peak		41.0	D	-		
PM peak		44.5	D	-		
7 Columbia Avenue / Northgate Street (U)						
AM peak	NBL	13.7	B	-		
PM peak	NBL	13.5	B	-		
8 Columbia Avenue / Research Park Drive (U)						
AM peak	NBL	11.1	B	-		
PM peak	NBL	19.4	C	-		
9 Palmyrita Avenue / Michigan Avenue (U)						
AM peak	SBL	10.5	B	-		
PM peak	SBL	16.8	C	-		
10 Marlborough Avenue / Chicago Avenue (U)						
AM peak	WBL	24.8	C	-		
PM peak	WBL	23.9	C	-		

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TABLE 6
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + PROJECT (2018)
INTERSECTION OPERATIONS

INTERSECTION			DELAY	LOS	SIGNIFICANT IMPACT	MITIGATION	
						DELAY	LOS
11 Marlborough Avenue / Atlanta Avenue (U)							
	AM peak	NBL	10.4	B	-		
	PM peak	NBL	10.9	B	-		
12 Marlborough Avenue / Iowa Avenue (S)							
	AM peak		26.9	C	-		
	PM peak		36.0	D	-		
13 Marlborough Avenue / Rustin Avenue (U)							
	AM peak	NBL	19.5	C	-		
	PM peak	NBL	24.6	C	-		
14 Marlborough Avenue / Northgate Street (U)							
	AM peak	SBL	11.5	B	-		
	PM peak	SBL	12.1	B	-		

- Delays and Level of Service calculated utilizing the methodologies described in Chapters 18 & 19 of the 2010 Highway Capacity Manual (HCM).

DELAY is measured in seconds

LOS = Level of Service

NB = Northbound, SB = Southbound, etc.

T=thru movement, R=right-turn movement, etc.

(S) = Signalized intersection

(U) = Unsignalized intersection

Mitigation for Intersections 3 and 4 are analyzed to assume signalization of the intersection with protected left turns where applicable.

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TABLE 7
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + PROJECT ROADWAY SEGMENT OPERATIONS

	STREET SEGMENT	EXISTING CLASSIFICATION	EX + PROJ VOLUME			
			Capacity[a]	ADT	V/C	LOS
1	Columbia Avenue, Primer Street to E La Cadena Drive	100' ARTERIAL	33,000	21,596	0.65	B
2	Columbia Avenue, E La Cadena Drive to Chicago Avenue	110' ARTERIAL	33,000	24,957	0.76	B
3	Columbia Avenue, Chicago Avenue to Iowa Avenue	110' ARTERIAL	33,000	16,091	0.49	A
4	Columbia Avenue, Iowa Avenue to Northgate Street	110' ARTERIAL	33,000	8,944	0.27	A
5	Columbia Avenue, Research Park Drive to Michigan Avenue	100' ARTERIAL	33,000	3,450	0.10	A
6	Michigan Avenue, Columbia Avenue to Palmyrita Avenue	66' COLLECTOR	12,500	3,242	0.26	A
7	Marlborough Avenue, Chicago Avenue to Atlanta Avenue	66' COLLECTOR	12,500	3,101	0.25	A
8	Marlborough Avenue, Atlanta Avenue to Iowa Avenue	66' COLLECTOR	12,500	3,137	0.25	A
9	Marlborough Avenue, Iowa Avenue to Rustin Avenue	66' COLLECTOR	12,500	3,442	0.28	A
10	Marlborough Avenue, Rustin Avenue to Northgate Street	66' COLLECTOR	12,500	4,950	0.40	A
11	Chicago Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	11,468	0.35	A
12	Iowa Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	23,517	0.71	B
13	Northgate Street, Marlborough Avenue to Columbia Avenue	66' COLLECTOR	12,500	3,313	0.27	A
14	Research Park Drive, South of Columbia Avenue	LOCAL	3,100	2,158	0.70	B

Footnote:

a. LOS A and LOS B capacity thresholds were derived; City of Riverside deems anything better than LOS C as acceptable.

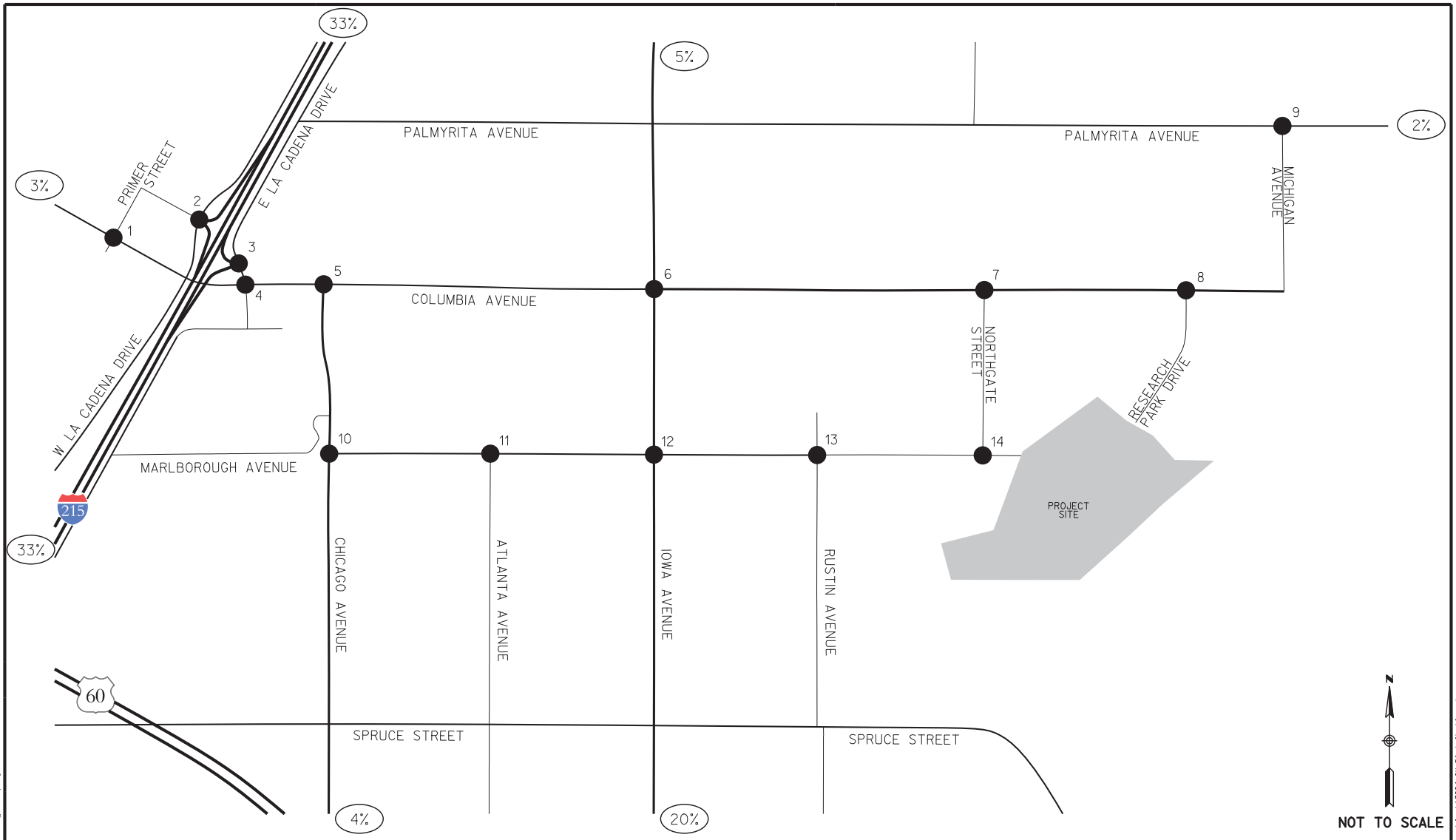

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EXHIBIT 6

PROJECT TRIP DISTRIBUTION

MARLBOROUGH INDUSTRIAL PROJECT

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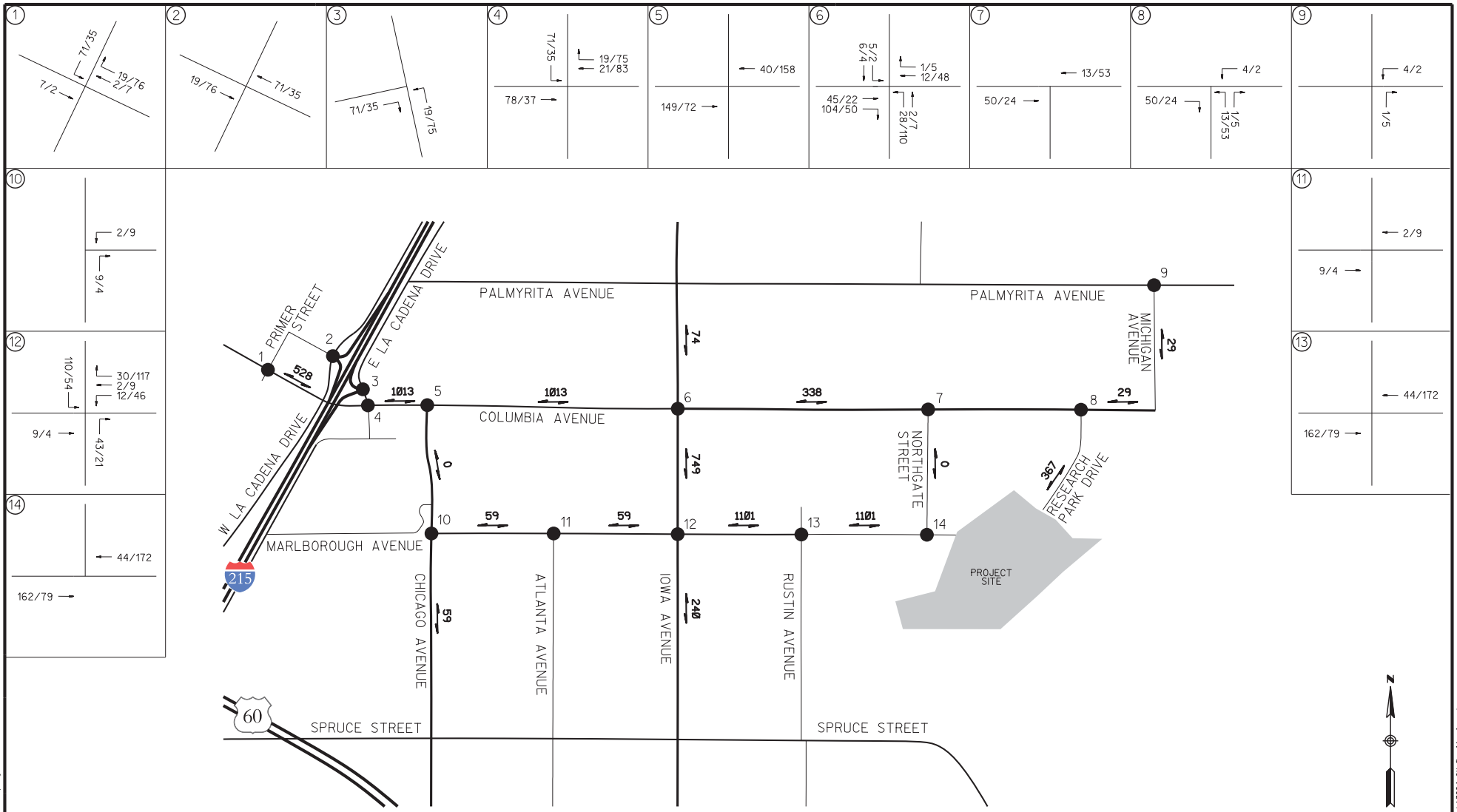

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EXHIBIT 7

PROJECT VOLUMES

MARLBOROUGH INDUSTRIAL PROJECT

LEGEND

XXX/XXX =AM/PM PEAK HOUR

X,XXX =AVERAGE DAILY TRAFFIC VOLUME

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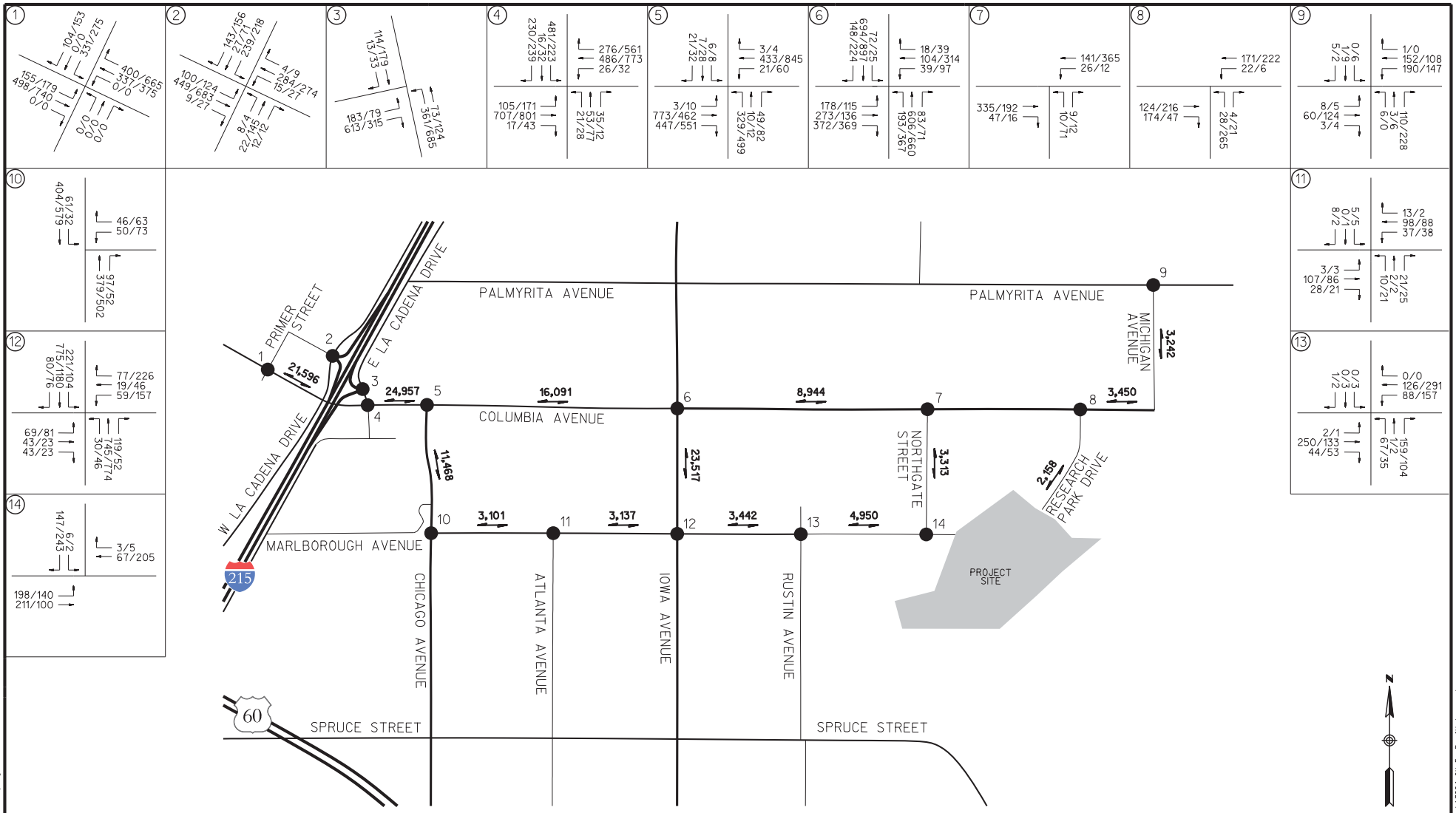

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EXHIBIT 8

EXISTING + PROJECT VOLUMES

MARLBOROUGH INDUSTRIAL PROJECT

LEGEND

XXX/XXX =AM/PM PEAK HOUR

X,XXX =AVERAGE DAILY TRAFFIC VOLUME

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EXISTING + AMBIENT + PROJECT OPERATIONS (2018)

In order to estimate the traffic volumes at the opening of the proposed project, the calculated project trips were added to the 2018 existing plus ambient traffic. **Exhibit 9** shows the 2018 total traffic volumes (includes project traffic) within the project study area.

Signalized Intersections

Table 8 shows that all the project area signalized intersections are anticipated to operate at LOS D or better during the AM and PM peak hours.

Un-signalized Intersections

Table 8 shows that all the project area signalized intersections are anticipated to operate at LOS D or better during the AM and PM peak hours, with the exception of the following:

- Interchange Street / W La Cadena Drive / I-215 SB Ramps – LOS F during PM Peak Hour
- E La Cadena Drive / I-215 NB Ramps – LOS F during AM/PM Peak Hour

Roadway Segments

Table 9 shows that most of the project area roadway segments analyzed will operate at LOS B or better.

CUMULATIVE PROJECT (2018) TRAFFIC ANALYSIS

The City of Riverside's Planning Department was contacted to determine a list of cumulative projects to be included in this traffic analysis. Information on 3 projects within a 1.5 mile radius of the project, for which permits had been issued, was provided. The following projects were considered for the cumulative analysis:

- 925-975 Marlborough Avenue – 62,000sf of warehouse/industrial land use
- Northeast corner of Stacy Court and Paige Drive – 3,008sf vehicle repair facility
- 1080 Marlborough Avenue – 5 warehouse buildings ranging in size from 10,000sf – 13,850sf

Trip generation was performed for each of these projects and the cumulative trips were distributed to the project area intersections and roadways based on anticipated trip distribution patterns. Trip generation and traffic assignment figures can be found in **Appendix F**. The cumulative traffic volumes were then added to the existing + ambient + project traffic volumes. **Exhibit 10** shows the existing + ambient + cumulative + project traffic volumes (Year 2018).

EXISTING + AMBIENT + CUMULATIVE + PROJECT OPERATIONS (2018)

Signalized Intersections

Table 10 shows that all project area signalized intersections are anticipated to operate at LOS D or better during the AM and PM peak hours.

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TABLE 8
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT + PROJECT (2018)
INTERSECTION OPERATIONS

INTERSECTION		DELAY	LOS	SIGNIFICANT IMPACT	MITIGATION	
					DELAY	LOS
1 Columbia Avenue / Primer Street (S)						
AM peak		18.5	B	-		
PM peak		21.6	C	-		
2 Interchange Street / W La Cadena Drive / I-215 SB Ramps (U)						
AM peak	EBL	23.2	C	-		
PM peak	EBL	**67.5**	**F**	Y	46.0	D
3 E La Cadena Drive / I-215 NB Ramps (U)						
AM peak	EBL	**153.4**	**F**	Y	7.4	A
PM peak	EBL	**743.8**	**F**	Y	7.3	A
4 Columbia Avenue / E La Cadena Drive (S)						
AM peak		33.1	C	-		
PM peak		29.8	C	-		
5 Columbia Avenue / Chicago Avenue (S)						
AM peak		28.1	C	-		
PM peak		29.9	C	-		
6 Columbia Avenue / Iowa Avenue (S)						
AM peak		41.8	D	-		
PM peak		45.5	D	-		
7 Columbia Avenue / Northgate Street (U)						
AM peak	NBL	13.9	B	-		
PM peak	NBL	13.6	B	-		
8 Columbia Avenue / Research Park Drive (U)						
AM peak	NBL	11.1	B	-		
PM peak	NBL	19.9	C	-		
9 Palmyrita Avenue / Michigan Avenue (U)						
AM peak	SBL	10.5	B	-		
PM peak	SBL	17.1	C	-		
10 Marlborough Avenue / Chicago Avenue (U)						
AM peak	WBL	26.1	D	-		
PM peak	WBL	31.6	D	-		

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TABLE 8
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT + PROJECT (2018)
INTERSECTION OPERATIONS

INTERSECTION			DELAY	LOS	SIGNIFICANT IMPACT	MITIGATION	
						DELAY	LOS
11 Marlborough Avenue / Atlanta Avenue (U)							
	AM peak	NBL	10.4	B	-		
	PM peak	NBL	10.9	B	-		
12 Marlborough Avenue / Iowa Avenue (S)							
	AM peak		27.9	C	-		
	PM peak		37.1	D	-		
13 Marlborough Avenue / Rustin Avenue (U)							
	AM peak	NBL	20.1	C	-		
	PM peak	NBL	25.0	C	-		
14 Marlborough Avenue / Northgate Street (U)							
	AM peak	SBL	11.4	B	-		
	PM peak	SBL	12.2	B	-		

- Delays and Level of Service calculated utilizing the methodologies described in Chapters 18 & 19 of the 2010 Highway Capacity Manual (HCM).

DELAY is measured in seconds

LOS = Level of Service

NB = Northbound, SB = Southbound, etc.

T=thru movement, R=right-turn movement, etc.

(S) = Signalized intersection

(U) = Unsignalized intersection

Mitigation for Intersections 3 and 4 are analyzed to assume signalization of the intersection with protected left turns where applicable.

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TABLE 9
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT + PROJECT ROADWAY SEGMENT OPERATIONS

	STREET SEGMENT	EXISTING CLASSIFICATION	EX + AMB + PROJ VOLUME			
			Capacity[a]	ADT	V/C	LOS
1	Columbia Avenue, Primer Street to E La Cadena Drive	100' ARTERIAL	33,000	22,017	0.67	B
2	Columbia Avenue, E La Cadena Drive to Chicago Avenue	110' ARTERIAL	33,000	25,436	0.77	B
3	Columbia Avenue, Chicago Avenue to Iowa Avenue	110' ARTERIAL	33,000	16,393	0.50	A
4	Columbia Avenue, Iowa Avenue to Northgate Street	110' ARTERIAL	33,000	9,116	0.28	A
5	Columbia Avenue, Research Park Drive to Michigan Avenue	100' ARTERIAL	33,000	3,518	0.11	A
6	Michigan Avenue, Columbia Avenue to Palmyrita Avenue	66' COLLECTOR	12,500	3,306	0.26	A
7	Marlborough Avenue, Chicago Avenue to Atlanta Avenue	66' COLLECTOR	12,500	3,162	0.25	A
8	Marlborough Avenue, Atlanta Avenue to Iowa Avenue	66' COLLECTOR	12,500	3,199	0.26	A
9	Marlborough Avenue, Iowa Avenue to Rustin Avenue	66' COLLECTOR	12,500	3,489	0.28	A
10	Marlborough Avenue, Rustin Avenue to Northgate Street	66' COLLECTOR	12,500	5,027	0.40	A
11	Chicago Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	11,697	0.35	A
12	Iowa Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	23,972	0.73	B
13	Northgate Street, Marlborough Avenue to Columbia Avenue	66' COLLECTOR	12,500	3,379	0.27	A
14	Research Park Drive, South of Columbia Avenue	LOCAL	3,100	2,194	0.71	B

Footnote:

a. LOS A and LOS B capacity thresholds were derived; City of Riverside deems anything better than LOS C as acceptable.

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TABLE 10
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT + PROJECT + CUM PROJECTS (2018)
INTERSECTION OPERATIONS

INTERSECTION		DELAY	LOS	SIGNIFICANT IMPACT	MITIGATION	
					DELAY	LOS
1 Columbia Avenue / Primer Street (S)						
AM peak		19.2	B	-		
PM peak		21.8	C	-		
2 Interchange Street / W La Cadena Drive / I-215 SB Ramps (U)						
AM peak	EBL	26.7	D	-		
PM peak	EBL	**74.5**	**F**	Y	48.5	D
3 E La Cadena Drive / I-215 NB Ramps (U)						
AM peak	EBL	**170.8**	**F**	Y	7.4	A
PM peak	EBL	**895.0**	**F**	Y	7.5	A
4 Columbia Avenue / E La Cadena Drive (S)						
AM peak		34.3	C	-		
PM peak		31.4	C	-		
5 Columbia Avenue / Chicago Avenue (S)						
AM peak		28.6	C	-		
PM peak		30.3	C	-		
6 Columbia Avenue / Iowa Avenue (S)						
AM peak		50.7	D	-		
PM peak		49.1	D	-		
7 Columbia Avenue / Northgate Street (U)						
AM peak	NBL	14.4	B	-		
PM peak	NBL	14.0	B	-		
8 Columbia Avenue / Research Park Drive (U)						
AM peak	NBL	11.1	B	-		
PM peak	NBL	20.0	C	-		
9 Palmyrita Avenue / Michigan Avenue (U)						
AM peak	SBL	10.6	B	-		
PM peak	SBL	17.2	C	-		
10 Marlborough Avenue / Chicago Avenue (U)						
AM peak	WBL	26.2	D	-		
PM peak	WBL	25.5	D	-		

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TABLE 10
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT + PROJECT + CUM PROJECTS (2018)
INTERSECTION OPERATIONS

INTERSECTION		DELAY	LOS	SIGNIFICANT IMPACT	MITIGATION	
					DELAY	LOS
11 Marlborough Avenue / Atlanta Avenue (U)						
AM peak						
	NBL	10.5	B	-		
PM peak						
	NBL	11.0	B	-		
12 Marlborough Avenue / Iowa Avenue (S)						
AM peak						
		35.2	D	-		
PM peak						
		42.4	D	-		
13 Marlborough Avenue / Rustin Avenue (U)						
AM peak						
	NBL	26.3	D	-		
PM peak						
	NBL	28.1	D	-		
14 Marlborough Avenue / Northgate Street (U)						
AM peak						
	SBL	11.7	B	-		
PM peak						
	SBL	12.3	B	-		

- Delays and Level of Service calculated utilizing the methodologies described in Chapters 18 & 19 of the 2010 Highway Capacity Manual (HCM).

DELAY is measured in seconds

LOS = Level of Service

NB = Northbound, SB = Southbound, etc.

T=thru movement, R=right-turn movement, etc.

(S) = Signalized intersection

(U) = Unsignalized intersection

Mitigation for Intersections 3 and 4 are analyzed to assume signalization of the intersection with protected left turns where applicable.

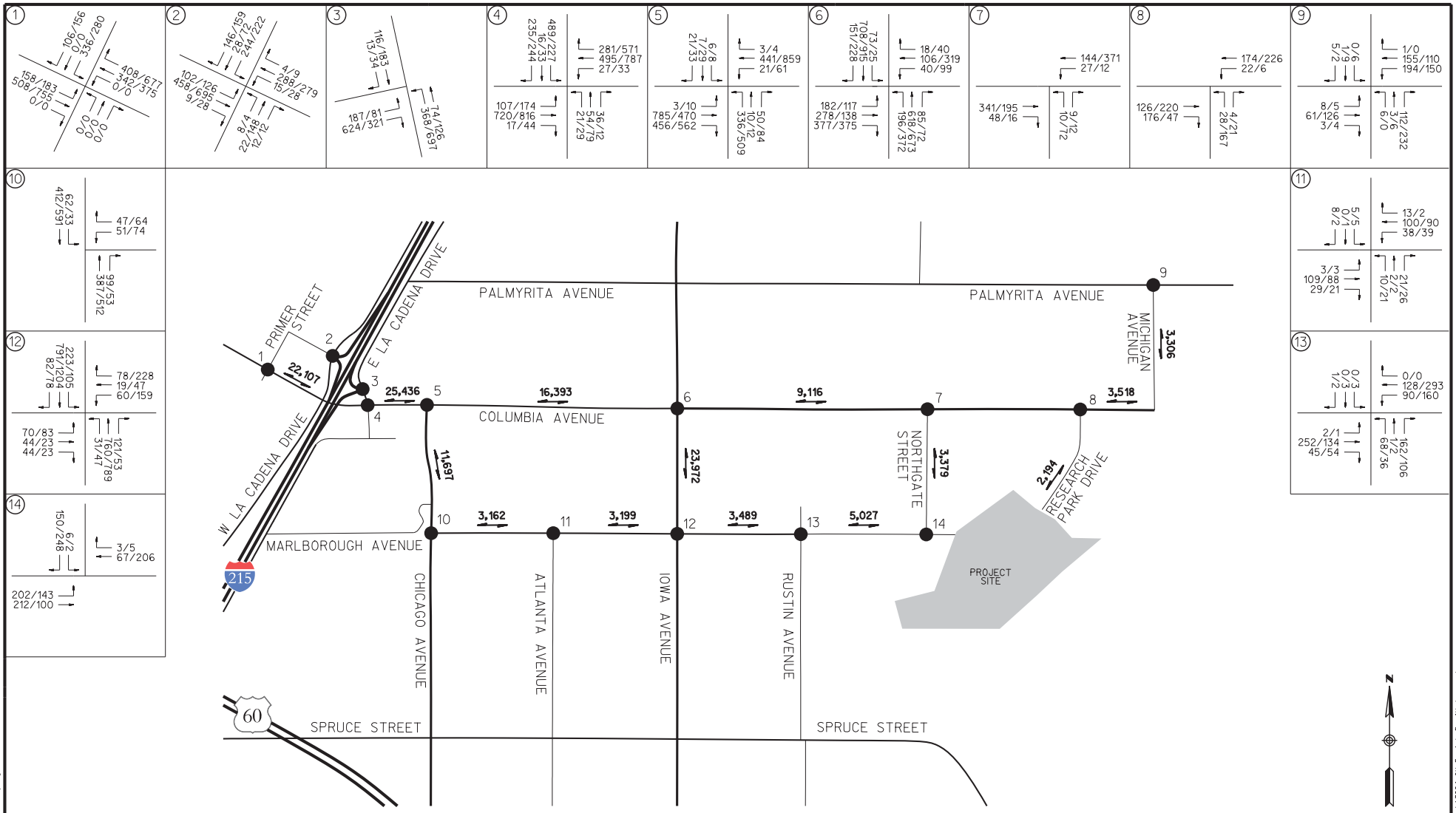

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EXHIBIT 9

EXISTING + AMBIENT + PROJECT VOLUMES

MARLBOROUGH INDUSTRIAL PROJECT

LEGEND

XXX/XXX =AM/PM PEAK HOUR

X,XXX =AVERAGE DAILY TRAFFIC VOLUME

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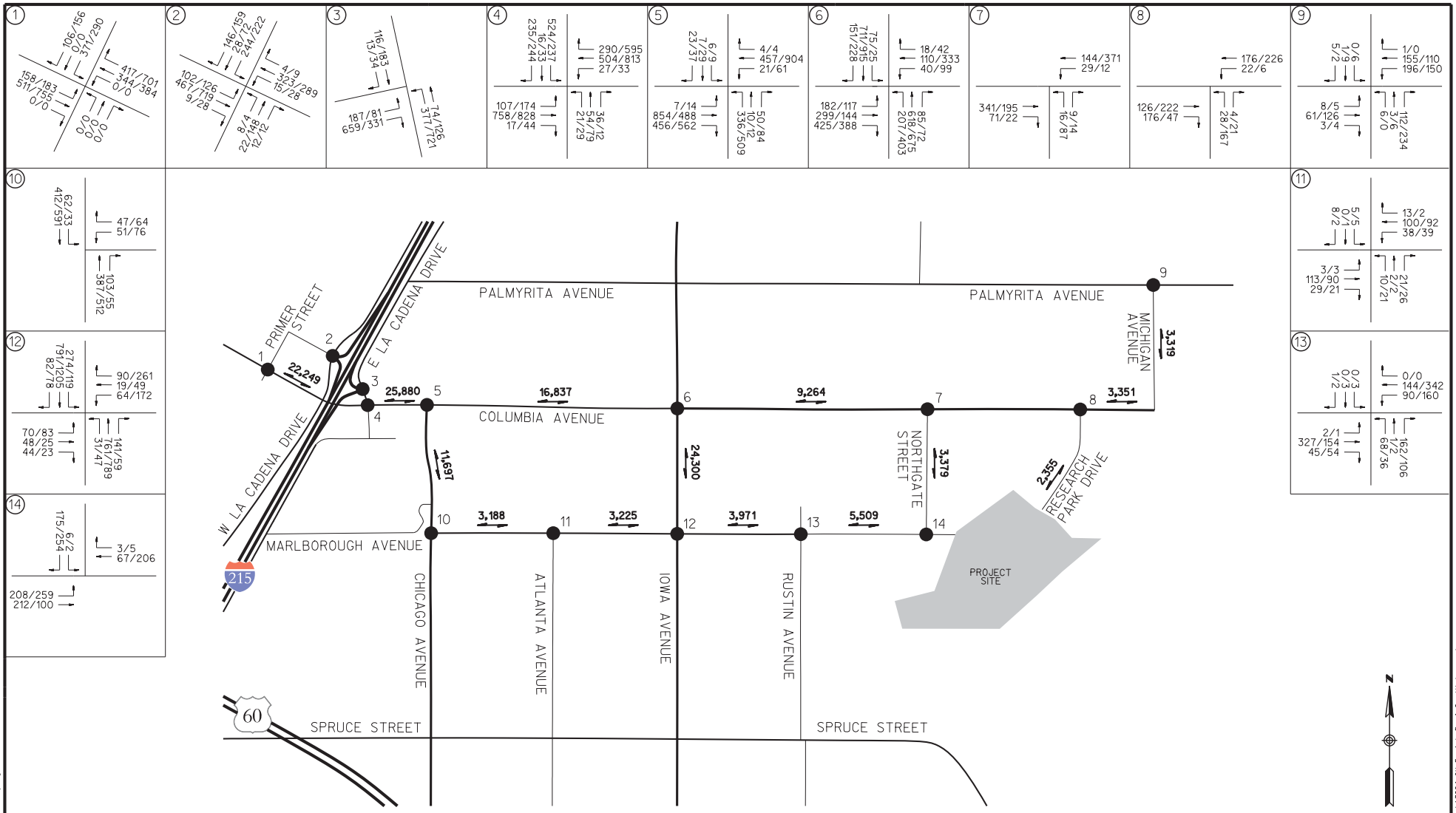

EXHIBIT 10

EXISTING + AMBIENT + PROJECT + CUMULATIVE VOLUMES

MARLBOROUGH INDUSTRIAL PROJECT

LEGEND

XXX/XXX =AM/PM PEAK HOUR

X,XXX =AVERAGE DAILY TRAFFIC VOLUME

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Un-signalized Intersections

Table 10 shows that all project area signalized intersections are anticipated to operate at LOS D or better during the AM and PM peak hours, with the exception of the following:

- Interchange Street / W La Cadena Drive / I-215 SB Ramps – LOS F during PM Peak Hour
- E La Cadena Drive / I-215 NB Ramps – LOS F during AM/PM Peak Hour

Roadway Segments

Table 11 shows that most of the project area roadway segments analyzed will operate at LOS B or better.

CONCLUSIONS/RECOMMENDATIONS

The study evaluated any potential traffic impacts due to the proposed Project. The project is anticipated to be constructed by 2018, and is anticipated to generate a total of 1,468 new daily trips with 274 trips (216 inbound/58 outbound) during the AM peak hour and 335 trips (105 inbound/230 outbound) during the PM peak hour.

Interchange Street/W La Cadena Drive/I-215 SB Ramps
As shown, the intersection of Interchange Street/W La Cadena Drive/I-215 SB Ramps is currently operating below acceptable levels of service and is anticipated to operate unacceptably with the addition of project traffic. The following recommendations are proposed for the intersection that will fall below the level of acceptable thresholds based on the City of Riverside Guidelines:

This intersection is expected to operate an LOS F with the addition of project traffic. The addition of project traffic to the intersection increases the intersection delay by more than 15 seconds in the PM peak hour as indicated on **Table 6** to the intersection, in the current configuration.

For the intersection to operate at an LOS D or better, at Buildout (with the addition of project traffic), the intersection would need to be signalized. A signal is determined to be warranted as shown in the calculations provided in **Appendix G**. With the current lane configuration the signal would have to provide split phases for all directions. The intersection would operate acceptably per the City of Riverside's Guidelines once these mitigation measures are implemented. There are currently no plans by the City of Riverside to improve this intersection. The fair-share contribution is calculated to be 7%. Refer to **Appendix H** for Fair-share calculations.

I-215 NB Ramps/E La Cadena Drive
As shown, the intersection of I-215 NB Ramps/E La Cadena Drive is currently operating below acceptable levels of service and is anticipated to continue to operate unacceptably with the addition of project traffic. The following recommendations are proposed for the intersection that will fall below the level of acceptable thresholds based on the City of Riverside Guidelines:

This intersection is expected to operate an LOS F with the addition of project traffic. The addition of project traffic to the intersection increases the intersection delay by more than 30 seconds in the AM and PM peak hours as indicated on **Table 6** to the intersection, in the current configuration.

For the intersection to operate at an LOS D or better, at Buildout (with the addition of project traffic), the intersection would need to be signalized. A signal is determined to be warranted as shown in the calculations provided in **Appendix G.** With the current lane configuration the signal would have to provide permissive phases for the northbound and southbound movements and a split phase for the

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TABLE 11
MARLBOROUGH INDUSTRIAL PROJECT
EXISTING + AMBIENT + PROJECT + CUMULATIVE ROADWAY SEGMENT OPERATIONS

	STREET SEGMENT	EXISTING CLASSIFICATION	EX + AMB + PROJ + CUM VOLUME			
			Capacity[a]	ADT	V/C	LOS
1	Columbia Avenue, Primer Street to E La Cadena Drive	100' ARTERIAL	33,000	22,249	0.67	B
2	Columbia Avenue, E La Cadena Drive to Chicago Avenue	110' ARTERIAL	33,000	25,880	0.78	B
3	Columbia Avenue, Chicago Avenue to Iowa Avenue	110' ARTERIAL	33,000	16,837	0.51	A
4	Columbia Avenue, Iowa Avenue to Northgate Street	110' ARTERIAL	33,000	9,264	0.28	A
5	Columbia Avenue, Research Park Drive to Michigan Avenue	100' ARTERIAL	33,000	3,531	0.11	A
6	Michigan Avenue, Columbia Avenue to Palmyrita Avenue	66' COLLECTOR	12,500	3,319	0.27	A
7	Marlborough Avenue, Chicago Avenue to Atlanta Avenue	66' COLLECTOR	12,500	3,188	0.26	A
8	Marlborough Avenue, Atlanta Avenue to Iowa Avenue	66' COLLECTOR	12,500	3,225	0.26	A
9	Marlborough Avenue, Iowa Avenue to Rustin Avenue	66' COLLECTOR	12,500	3,971	0.32	A
10	Marlborough Avenue, Rustin Avenue to Northgate Street	66' COLLECTOR	12,500	5,509	0.44	A
11	Chicago Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	11,697	0.35	A
12	Iowa Avenue, Marlborough Avenue to Columbia Avenue	110' ARTERIAL	33,000	24,300	0.74	B
13	Northgate Street, Marlborough Avenue to Columbia Avenue	66' COLLECTOR	12,500	3,379	0.27	A
14	Research Park Drive, South of Columbia Avenue	LOCAL	3,100	2,355	0.76	B

Footnote:

a. LOS A and LOS B capacity thresholds were derived; City of Riverside deems anything better than LOS C as acceptable.

eastbound traffic off the freeway. The intersection would operate acceptably per the City of Riverside's Guidelines once these mitigation measures are implemented. There are currently no plans by the City of Riverside to improve this intersection. The fair-share contribution is calculated to be 7%. Refer to **Appendix H** for Fair-share calculations.

REFERENCES

1. Caltrans Division of Traffic Operations, California Manual on Uniform Traffic Control Devices, Sacramento, CA, 2014.

2. City of Riverside, Master Plan of Roadways (Circulation Element Figure CCM-4), Riverside, CA, 2007.

3. City of Riverside, Traffic Impact Analysis Preparation Guide, Riverside, CA, 2014.

4. Trafficware, SYNCHRO, Version 9, Build 805, Sugar Land, Texas, 2013.

5. Transportation Research Board, Highway Capacity Manual, Washington, D.C., 2010.