11.8 Wildfire Studies

Fire Protection Plan

Beaumont Heights Business Centre

JANUARY 2026

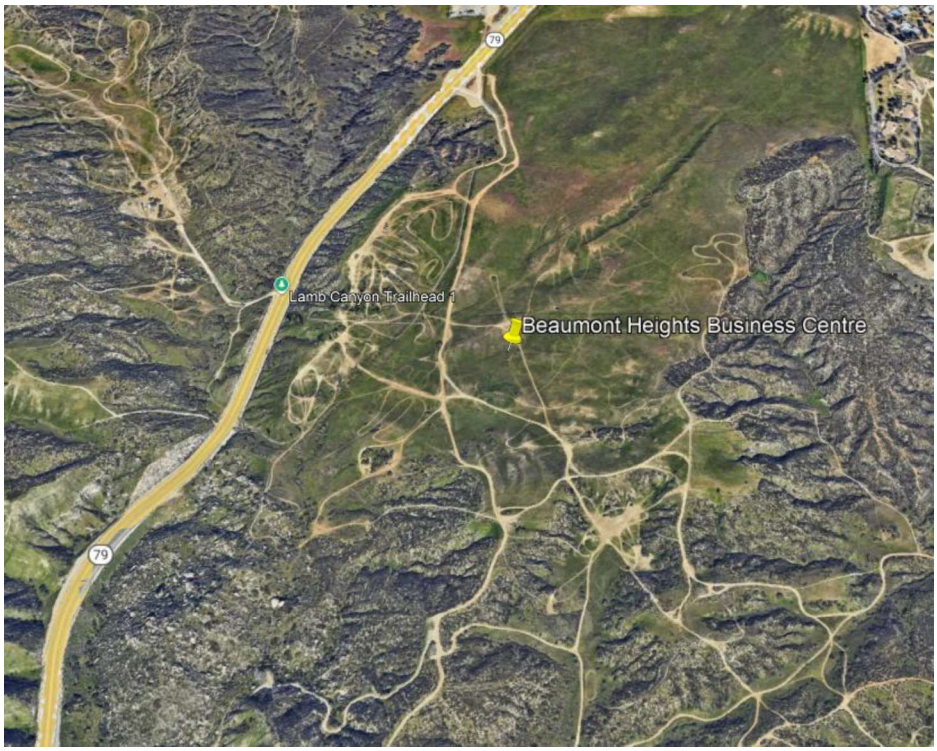

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Table of Contents

SECTION **PAGE NO.**

Executive Summary v

1 Introduction 1
- 1.1 Applicable Codes/Existing Regulations 1
- 1.2 Project Summary 2
  - 1.2.1 Project Overview 2
  - 1.2.2 Location 2
  - 1.2.3 Existing Land Use 9
  - 1.2.4 Project Description 9

2 Project Site Risk Analysis 15
- 2.1 Field Assessment 15
- 2.2 Project Site Characteristics and Fire Environment 15
  - 2.2.1 Topography 16
  - 2.2.2 Climate 16
  - 2.2.3 Vegetation 16
  - 2.2.4 Fire History 17
- 2.3 Analysis of Wildfire Risk from Adding New Development 18
- 2.4 Off-site Wildfire Impacts 19
  - 2.4.1 Vegetation management 19
  - 2.4.2 Firefighter Response 20
  - 2.4.3 Ignition Resistant/Noncombustible Construction 20
  - 2.4.4 Shelter in Place Capability 21
  - 2.4.5 Wildfire Risk Awareness Education 24

3 Anticipated Fire Behavior 25
- 3.1 Fire Behavior Modeling 25
- 3.2 Fire Behavior Modeling Analysis 25
- 3.3 Fire Behavior Modeling Results 27
- 3.4 Fire Behavior Summary 28
  - 3.4.1 Existing Conditions 28
  - 3.4.2 Post-Project Condition 29
- 3.5 Project Area Fire Risk Assessment 32

4 Emergency Response and Service 37
- 4.1 Emergency Response 37
- 4.2 Estimated Calls and Demand for Service from the Project 40

5 Fire Safety Requirements-Infrastructure, Building Ignition Resistance, and Defensible Space 43
5.1 Roads 43
5.1.1 Access 43
5.1.2 Surface and Grade 44
5.1.3 Road Width and Clearance 45
5.1.4 Aerial Fire Apparatus Access Road 45
5.1.5 Fire Lane Marking 46
5.1.6 Gates 46
5.1.7 Key Boxes 47
5.1.8 Premises Identification 48
5.1.9 Ongoing Infrastructure Maintenance 49
5.1.10 Pre-Construction Requirements 49
5.2 Ignition Resistant Construction and Fire Protection Systems 49
5.3 Fire Protection Systems 50
5.3.1 Water Supply 50
5.3.2 Hydrants 50
5.3.3 Fire Sprinklers 51
5.4 Defensible Space and Vegetation Management 51
5.4.1 Defensible Space 51
5.4.2 Fuel Modification Zone Requirements 52
5.4.3 Vegetation Management Maintenance 55
5.4.4 Environmentally Sensitive Areas/Open Space 56
5.4.5 Prohibited Plants 56
5.4.6 Construction Phase Vegetation Management 56
6 Wildfire Education Program 57
7 Evacuation Analysis 59
8 Conclusion 61
9 List of Preparers 63
10 References 65

TABLES

1 Fuel Model Characteristics 26
2 Variables Used for Fire Behavior Modeling 27
3 RAWS BehavePlus Fire Behavior Model Results – Existing Conditions 29
4 RAWS BehavePlus Fire Behavior Model Results – Post Proposed Project Conditions 31
5 Fire Suppression Interpretation 32
6 Closest Responding RCFD Fire Stations Summary 37
7 Project Emergency Response Analysis using Speed Limit Formula 38

8 Project Emergency Response Analysis using ISO Formula 38
9 Land Use Classification Information with Staffing/Time Response Standards 39
10 Conceptual Calculated Call Volume 40

FIGURES

1A Previous CAL FIRE Fire Hazard Severity Zones 3
1B Updated LRA (March 2025) CAL FIRE Fire Hazard Severity Zones 5
2 Project Location 7
3 Project Land Use Plan 11
4 Site Plan 13
5 BehavePlus Analysis Map 35

APPENDICES

A Representative Project Site Photographs
B Beaumont Heights Business Centre Project Vicinity Fire History Map
C BehavePlus Fire Behavior Analysis
D Ignition-Resistant Construction Requirements
E Project Fuel Modification Plan
F Prohibited Plant List

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Executive Summary

This Fire Protection Plan (FPP) has been prepared for the Beaumont Heights Business Centre Project (Project) currently located in an unincorporated area in Riverside County (County), California, and within the City of Beaumont Sphere of Influence. The Project proposes to annex 567.74 acres of the Project site into the City of Beaumont's jurisdiction. This FPP evaluates and identifies the potential fire risk associated with the Project's land uses and identifies requirements for water supply, fuel modification and defensible space, access, building ignition and fire resistance, and fire protection systems, among other pertinent fire protection criteria, including a conceptual development plan for the Project site described below. The purpose of this plan is to generate and memorialize the fire safety requirements and standards of the Riverside County Fire Department (RCFD) along with Project-specific design features and implementation measures based on the Project site, its intended use, and its fire environment, including both the conceptual land use plan and any modifications to buildings permitted pursuant to the Specific Plan.

This document provides analysis of the Project site's fire environment and its potential impact on the Project as well as the Project's potential impact on the existing fire protection service. Requirements and recommendations herein are based on Project site-specific fire environment analysis and Project characteristics and incorporates area fire planning documents, Project site risk analysis, and standard principles of fire protection planning.

As determined during the analysis of the Project site and its fire environment, in its current condition, may include characteristics that, under favorable weather conditions, could have the potential to facilitate fire spread. Under extreme conditions, wind-driven wildfires from nearby undeveloped land could cast embers onto the property. Once the Project is built, the Project's on-site fire potential will be much lower than its current condition due to conversion of wildland fuels to buildings, parking areas, managed landscapes, fuel modification areas, improved accessibility for fire personnel, and structures built to the latest ignition and ember resistant fire codes.

It is important to note that the fire safety requirements that will be implemented on the Project site, including ignition resistant construction standards, along with requirements for water supply, fire apparatus access, fuel modification and defensible space, interior fire sprinklers and five minute or less fire response travel times were integrated into the code requirements and internal guidelines based on results of post-fire assessments, similar to the After Action Reports that are now prepared after large fire events. When it became clear that specifics of how structures were built, how fire and embers contributed to ignition of structures, what effects fuel modification had on structure ignition, how fast firefighters could respond, and how much (and how reliable) water was available, were critically important to structure survivability, the Fire and Building codes were revised appropriately. Riverside County now boasts some of the most restrictive codes for building within Wildland Urban Interface (WUI) areas that focus on preventing structure ignition from heat, flame, and burning embers.

The Project proposes the construction of an industrial development on approximately 629.66 acres. The entire Project site has been designed with fire protection as a key objective. The Project site improvements are designed to facilitate emergency apparatus and personnel access throughout the Project site. Roads will provide access to the sides of all the buildings. Water availability and flow will be consistent with requirements including fire flow and hydrant distribution required by local and state codes. These features along with the ignition resistance of all buildings, the interior sprinklers, and the pre-planning, training, and awareness will assist responding firefighters through prevention, protection, and suppression capabilities.

As detailed in this FPP, the Project site's fire protection systems will include a redundant layering of protection methods that have proven to reduce overall fire risk. The requirements and recommendations included herein are performance based and Project site–specific, considering the Project site's unique characteristics rather than a prescriptive, one-size-fits-all approach. The fire protection systems are designed to increase occupant and building safety, reduce the fire risk on site, to minimize risks associated with typical uses, and aid the responding firefighters during an emergency. No singular measure is intended to be relied upon for the Project site's fire protection, but rather, a system of fire protection measures, methods, and features combine to result in enhanced fire safety, reduced fire potential, and improved safety in the development.

Early evacuation for any type of wildfire emergency at the Project site is the preferred method of providing for occupant and business safety, consistent with the Owner's and RCFD's current approach for evacuation. As such, the Project's Owner and Property Management Company will formally adopt, practice, and implement a "Ready, Set, Go!" (CAL FIRE 2025) approach to Project site evacuation. The "Ready, Set, Go!" concept is widely known and encouraged by the state of California and most fire agencies, including; Pre-planning for emergencies, including wildfire emergencies, focuses on being prepared, having a well-defined plan, minimizing potential for errors, maintaining the Project site's fire protection systems, and implementing a conservative (evacuate as early as possible) approach to evacuation and Project site uses during periods of fire weather extremes.

Based on the results of this FPP's analysis and findings, the following FPP implementation measures will be provided by Beaumont Heights Business Centre Project as part of the proposed development plan. These measures are discussed in more detail throughout this FPP.

The following measures shall be established to the satisfaction of the City for each Planning Area prior and as a condition to issuance of a building permit for any building on that Planning Area.

1. Project buildings will be constructed of ignition resistant[1] construction materials and include automatic fire sprinkler systems based on the latest adopted Building and Fire Codes for occupancy types.
2. Fuel Modification will be provided as needed around the perimeter of the Project site within all Planning Areas as required by RCFD and will be a minimum of 100 feet wide. In the project's present configuration, the 100 foot FMZ is achievable around all proposed buildings. The present project configuration does not have any areas that do not achieve the minimum 100 foot set back from the property line.
3. For any Planning Area in which the square footage or footprint of a proposed building has been modified from that described in this fire protection plan, the applicant shall submit and the RCFD shall have approved the revised fire protection plan for the Planning Area, consistent with Item 2 above.
4. Landscape plantings will not utilize prohibited plants that have been found to be highly flammable.
5. Fire apparatus access roads (i.e., public and private streets) will be provided throughout the industrial development and will vary in width and configuration but will all provide at least the minimum required unobstructed travel lanes, lengths, turnouts, turnarounds, and clearances required by applicable codes. Primary access and internal circulation will comply with the requirements of the RCFD.
6. Buildings will be equipped with automatic fire sprinkler systems designed to NFPA 13 standards and meeting RCFD requirements.

[1] A type of building material that resists ignition or sustained flaming combustion sufficiently to reduce losses from wildland-urban interface conflagrations under worst-case weather and fuel conditions with wildfire exposure of burning embers and small flames, as prescribed in CBC, Chapter 7A and State Fire Marshal Standard 12-7A-5, Ignition-Resistant Materials.

7. The Project shall demonstrate provision of water capacity and delivery to ensure a reliable water source for operations and during emergencies which may require extended fire flow.
8. Should future iterations of the Project's site plan result in buildings that do not achieve a minimum of 100 feet of defensible space, then alternative materials and methods may be proposed to provide the functional equivalency of a full 100 feet of defensible space. Alternative materials and methods will be to the satisfaction of the RCFD and may include structural hardening enhancements or landscape features, like non-combustible walls.

The following measures shall be established in the CC&Rs for the Project and implemented by the Property Owner(s) or Property Management Company. Annual maintenance should occur before May 1st of each year and inspected by RCFD or an approved third party.

1. On-going maintenance of all fuel modification will be managed by Owner's, Property Management Company, or another approved entity, at least annually or as needed.
2. The Property Owner(s) or Property Management Company, will provide business owners informational brochures at time of occupancy, which will include an outreach and educational role to ensure fire safety measures detailed in this FPP have been implemented and prepare development-wide "Ready, Set, Go!" plans.

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1 Introduction

This Fire Protection Plan (FPP) has been prepared for the proposed Beaumont Heights Business Centre Project (Project) in an unincorporated area in Riverside County (County), California, and within the City of Beaumont Sphere of Influence. The Project proposes to annex 567.74 acres of the Project site into the City of Beaumont's jurisdiction. This FPP evaluates and identifies the potential fire risk associated with the Project's land uses and identifies requirements for water supply, fuel modification and defensible space, access, building ignition and fire resistance, and fire protection systems, among other pertinent fire protection criteria, including a conceptual development plan for the Project site described below. The purpose of this plan is to generate and memorialize the fire safety requirements and standards of the Riverside County Fire Department (RCFD) along with Project-specific design features and implementation measures based on the Project site, its intended use, and its fire environment, including both the conceptual land use plan and any modifications to buildings permitted pursuant to the Specific Plan.

As part of the assessment, the plan has considered the property location, topography, surrounding combustible vegetation (fuel types), climatic conditions, and fire history for the Project site and the surrounding area. The plan addresses water supply, access, structural ignitability and fire resistive building features, fire protection systems and equipment, impacts to existing emergency services, defensible space, and vegetation management for the Project site and to address potential fire impacts to the surrounding area. The plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect structures and essential infrastructures within the Project site. The following tasks were performed toward completion of this plan:

- Gather Project site specific climate, terrain, and fuel data;
- Collect Project site photographs;
- Process and analyze the data using the latest GIS technology;
- Predict fire behavior using scientifically based fire behavior models, comparisons with actual wildfires in similar terrain and fuels, and experienced judgment;
- Analyze and guide design of proposed infrastructure;
- Analyze the existing emergency response capabilities;
- Assess the potential fire risk posed by the construction and operation of the Project to the Project site and surrounding area; and
- Prepare this FPP detailing how fire risk will be mitigated on the Project site and in the surrounding area through a system of fuel modification, structural ignition resistance enhancements, and fire protection delivery system upgrades.

Field observations were utilized to augment existing digital Project site data in generating the fire behavior models and formulating the recommendations presented in this FPP. Refer to Appendix A for Project site photographs of existing conditions.

1.1 Applicable Codes/Existing Regulations

This FPP demonstrates that Beaumont Heights Business Centre Project will comply with applicable portions of RCFD, Fire Prevention Standards and County Ordinances No. 460 and No. 787-11. The Project will also be

consistent with the 2025 edition of the California Building Code (CBC); 2025 edition of the California Fire Code (CFC); 2025 edition of the California WUI Code (CWUIC) or applicable code as adopted and amended by RCFD and the City of Beaumont at the time of construction. Additionally, RCFD references Fire Prevention Standards for informational purposes in clarifying and interpreting provisions of the CFC, National Fire Protection Association (NFPA) and California Public Resources Code (PRC). The Project will also comply with Chapter 5 of the CWUIC which focuses primarily on preventing ember penetration into buildings, a leading cause of structure loss from wildfires.

Compliance with the above building and fire code requirements is an important component of the requirements of this FPP given the Project's wildland-urban interface (WUI) location currently spans an area statutorily designated as a Very High Fire Hazard Severity Zone (VHFHSZ) (Figure 1A and 1B) state responsibility area (SRA) by California Department of Forestry and Fire Protection (CAL FIRE) (CAL FIRE 2025). Adjacent to the Project site, within the City of Beaumont's jurisdictional boundary to the east, the land is primarily designated as local responsibility area (LRA) Very High Fire Hazard Severity Zone. The previous CAL FIRE Fire Hazard Severity Zone map also categorized the Project site as an SRA VHFHSZ; however, the local responsibility area (LRA) VHFHSZ designations increased northeast and northwest of the Project site (Figure 1A and 1B). Since the Project is in the SRA, California Code of Regulations Title 14, Fire Safe Regulations also applies.

The designations of Fire Hazards are based on topography, vegetation, and weather, amongst other factors with more hazardous sites, which include steep terrain, un-maintained fuels/vegetation, and WUI locations. As described in this FPP, the Project will meet all applicable fire and building code requirements for building in these higher fire hazard areas or meet the intent of the code through the application of Project site-specific fire protection measures. These codes have been developed through decades of after fire structure save and loss evaluations to determine what causes building damage or destruction during wildfires. The resulting fire codes now focus on mitigating former structural vulnerabilities through construction techniques and materials so that the buildings are resistant to ignitions from direct flames, heat, and embers, as indicated in Chapter 5 of the 2025 CWUIC.

1.2 Project Summary

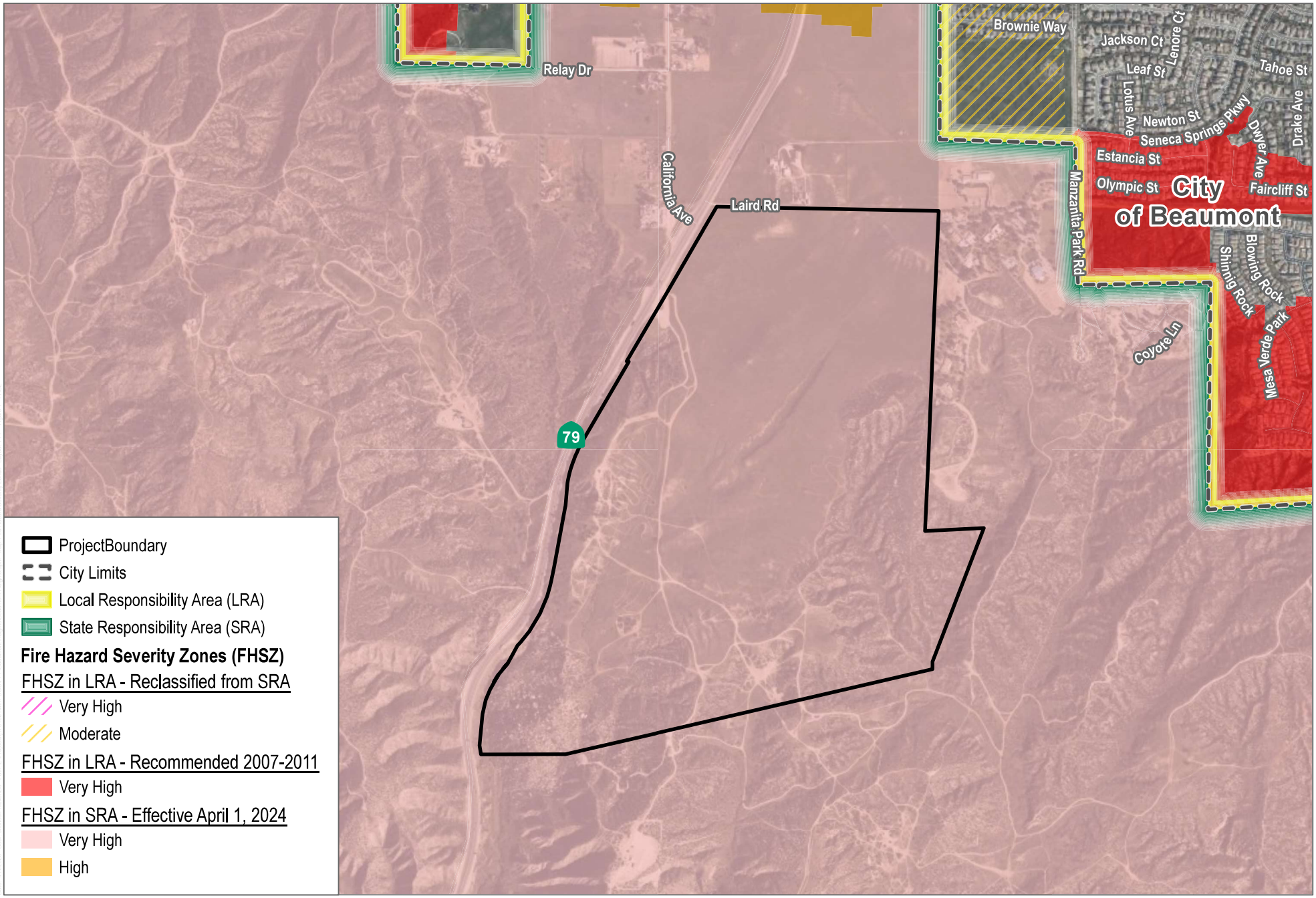
1.2.1 Project Overview

The Project proposes the construction of four industrial buildings with offices on approximately 385.99 acres of land and an additional 243.67 acres off site, for a total of 629.66 acres. (See Project Description, below).

1.2.2 Location

The approximately 629.66-acre Project site is currently in an unincorporated area within the City of Beaumont's Sphere of Influence in Riverside County (Figure 2, Project Location Map). The Project proposes to annex 567.74 acres of the Project site into the City of Beaumont's jurisdiction. More specifically, the Project site is located east of SR-79, south of Laird Road, north of Potrero Reserve, and northeast of the San Timoteo Badlands. The Project site is situated within Township 3 South, and Range 1 West, United States Geological Survey (USGS), 7.5-minute topographic map.

The onsite portion of the Beaumont Heights Business Centre Project site is located on the following Riverside County Assessors Parcels Numbers (APNs): 424-090-007, 424-090-008, 424-110-007, 424-110-008, 424-110-009, 424-110-010, 424-130-001, 424-130-002, 424-130-003, 424-140-001, and 428-020-001. The off site portion is located on the following APNs: 424-130-004, 424-130-005, 424-130-006, 424-130-007, 424-130-008, 424-130-009, 424-140-010, and portions of 428-010-019, 428-020-002, and 424-140-012.



SOURCE: CalFire 2024; Bing Maps 2023;

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FIGURE 1A

Previous Fire Hazard Severity Zones

Beaumont Heights Business Centre Fire Protection Plan

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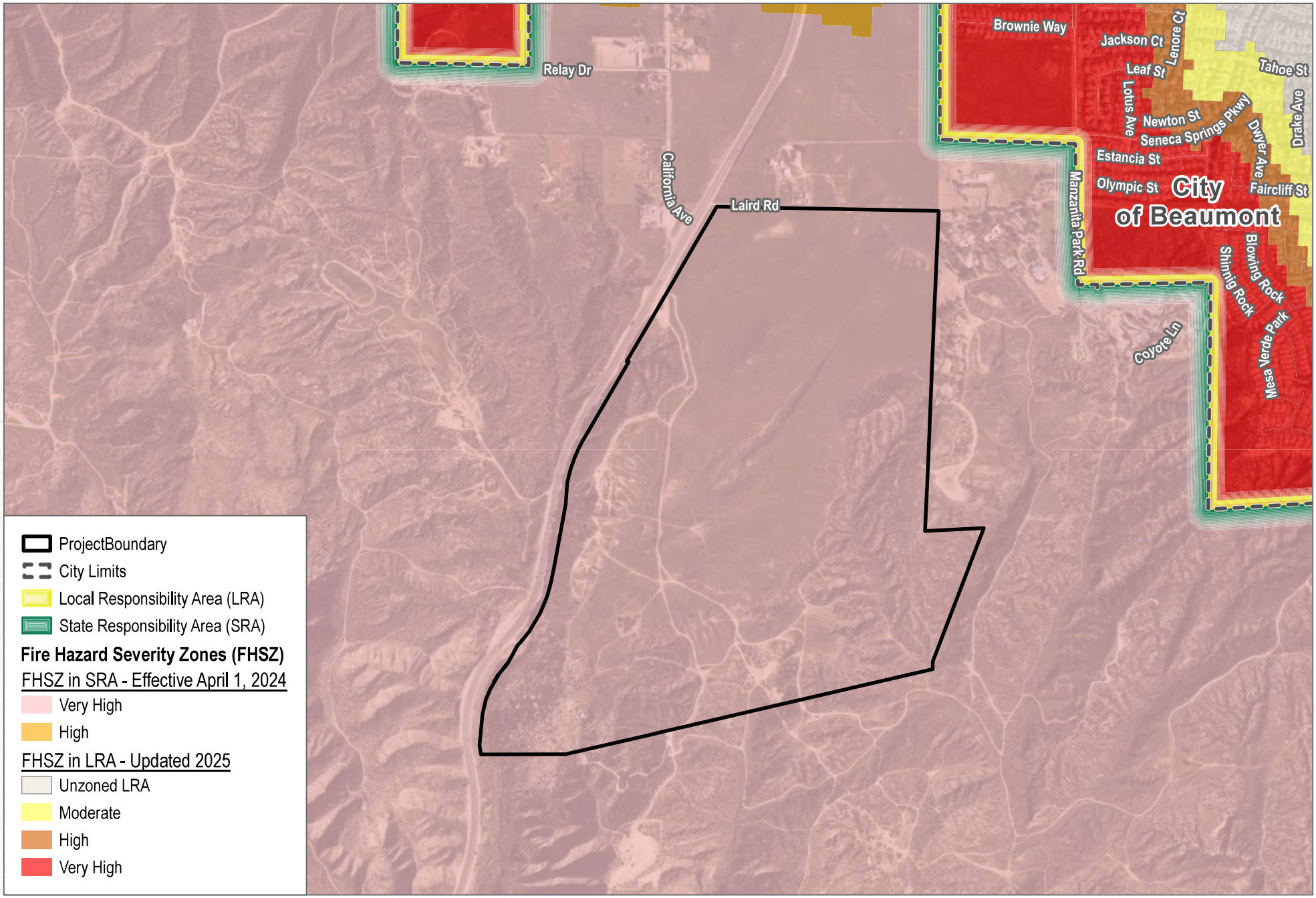

SOURCE: CalFire 2024; Bing Maps 2023;

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FIGURE 1B

Updated Fire Hazard Severity Zones

Beaumont Heights Business Centre Fire Protection Plan

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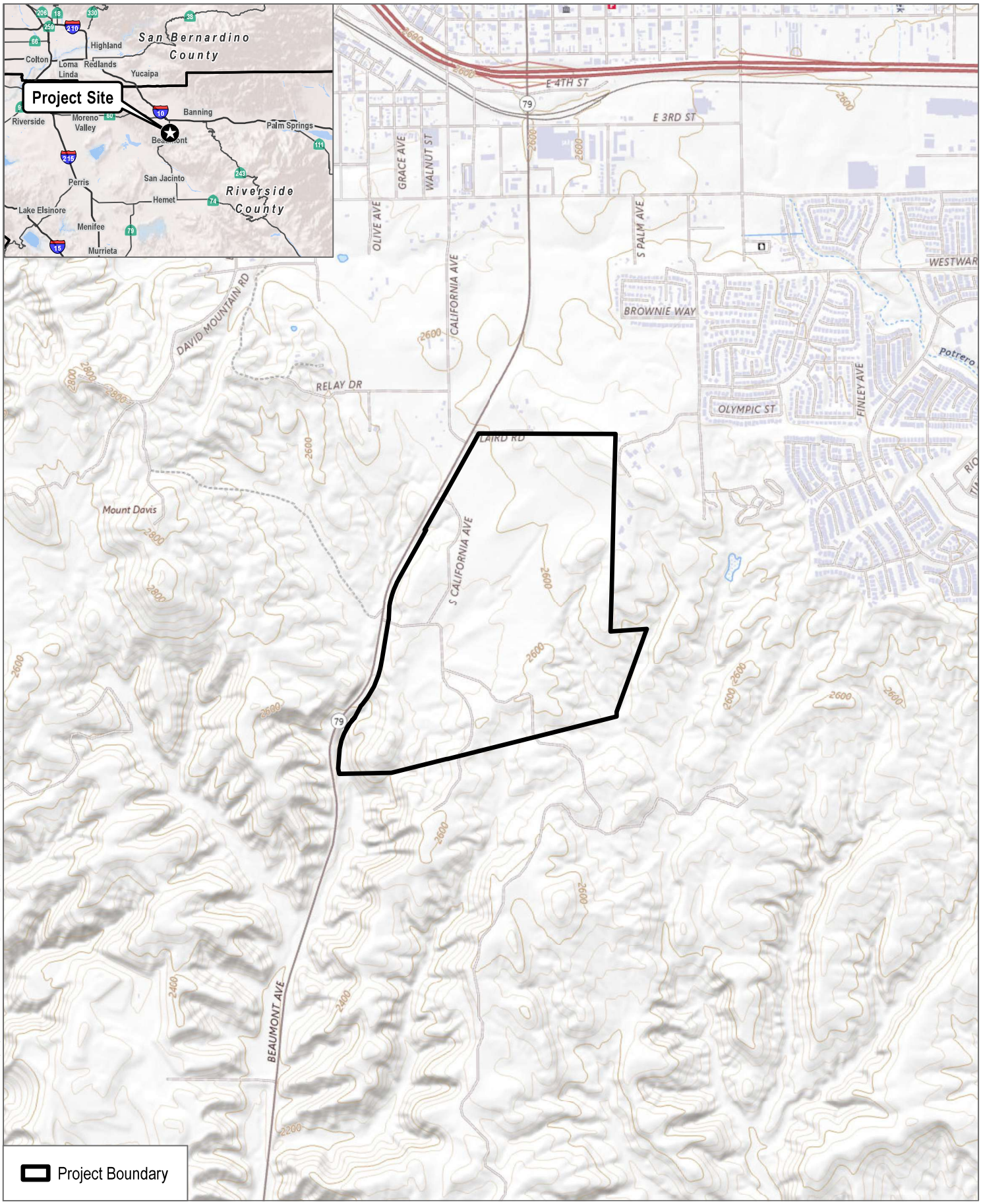

SOURCE: USGS National Map 2025

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FIGURE 2

Project Location

Beaumont Heights Business Centre Fire Protection Plan

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1.2.3 Existing Land Use

The Project site is currently undeveloped land that has been subject to disturbances from various sources including off-road vehicles and isolated trash dumping. The Project area is primarily vegetated with flat non-native grassland/ruderal vegetation in the northern portion of the Project site and chamise chaparral and southern mixed chaparral in the southern portion of the Project site. Numerous dirt roads and trails were observed throughout the Project site. The northern portion of the Project site is relatively flat, while the southern portion of the Project site is characterized by several ridgelines and valleys.

The Project site is adjacent to undeveloped vacant land and a single-family home to the north; institutional buildings (Harmony Haven Children and Youth Center), undeveloped vacant land, and residential neighborhoods to the east; undeveloped vacant land to the south; and the SR-79 Freeway to the west.

1.2.4 Project Description

The Beaumont Heights Business Centre Project proposes the development of four industrial buildings totaling approximately 5,178,206 square feet on 385.99 acres, a construction staging and earthwork balance area on 182.14 acres, water and recycled water utility improvements on 4.27 acres, and transportation improvements along SR-79 and utility installation along California Avenue on 57.26 acres for a total of 629.66 acres (refer to Figure 3- Land Use Plan and Figure 4 – Site Plan, for proposed land uses and building locations). It should be noted that the construction staging and earthwork balance area is temporary, as no permanent development has been proposed there. Additionally, the development site, which consists of the 385.99 acres where the industrial buildings will be located and the 182.14 acres of the construction staging and earthwork balance area, are proposed to be annexed into the City of Beaumont's jurisdiction. The four industrial buildings are anticipated to be high-cube fulfillment center warehouses and cold storage warehouses, where they primarily store manufactured goods prior to their distribution to retail stores or other warehouses.

Building 1 will include approximately 624,937 square feet of warehouse space, 6,000 square feet of office mezzanine space, and 6,000 square feet of office space for a total of 636,937 square feet. Building 1 will have 673 automobile parking stalls and 32 trailer parking stalls. Building 2 will include approximately 1,366,044 square feet of warehouse space, 10,000 square feet of office mezzanine space, and 10,000 square feet of office space for a total of 1,386,044 square feet. Building 2 will have 1,447 automobile parking stalls and no trailer parking stalls. Building 3 will include approximately 1,468,920 square feet of warehouse space, 10,000 square feet of office mezzanine space, and 10,000 square feet of office space for a total of 1,488,920 square feet. Building 3 will have 1,550 automobile parking stalls and 110 trailer parking stalls. Building 4 will include approximately 1,646,305 square feet of warehouse space, 10,000 square feet of office mezzanine space, and 10,000 square feet of offices space for a total of 1,666,305 square feet. Building 4 will have 1,727 automobile parking stalls and 205 trailer parking stalls.

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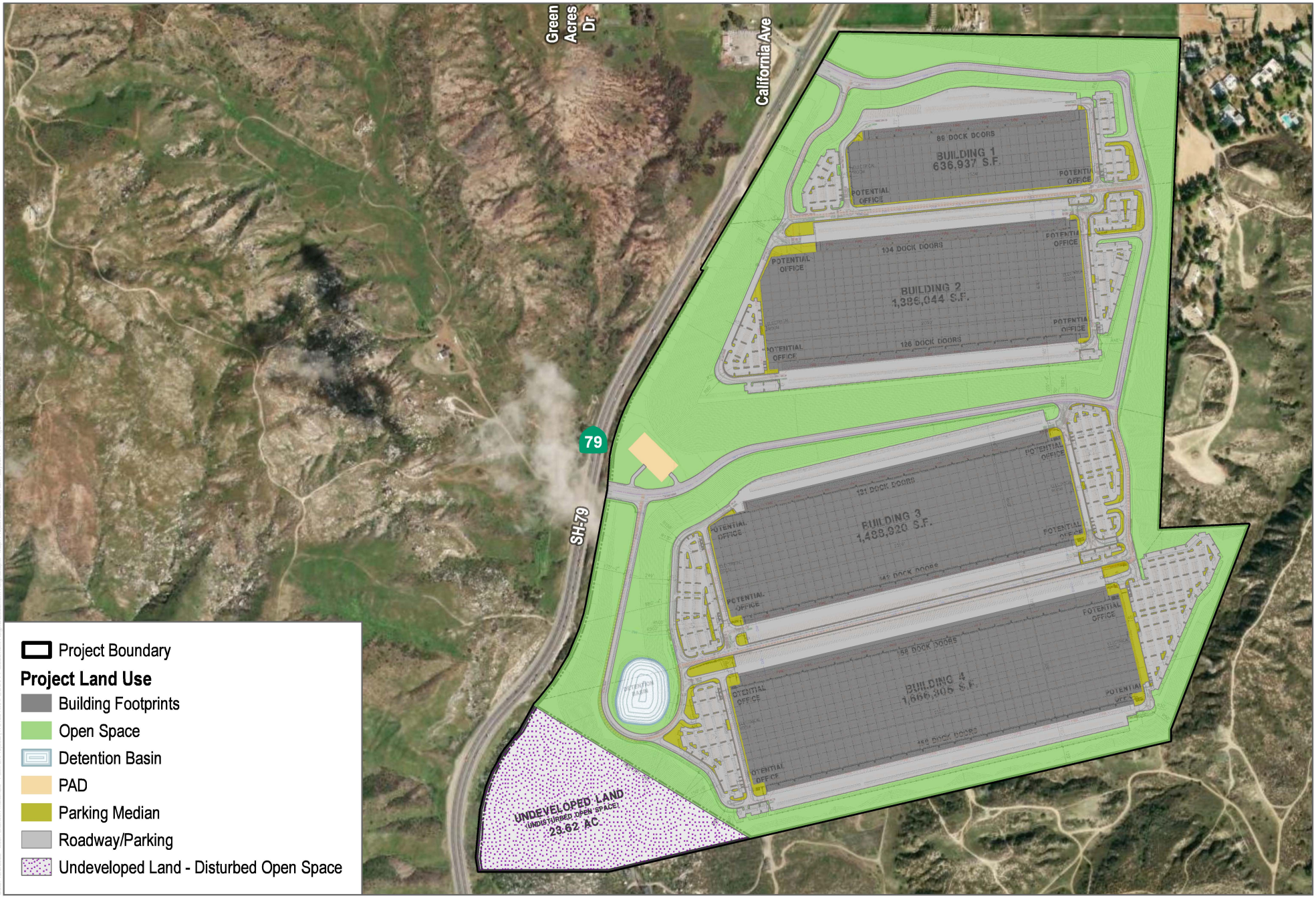

SOURCE:ESRI World Imagery 2025

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FIGURE 3

Project Land Use Plan

Beaumont Heights Fire Protection Plan

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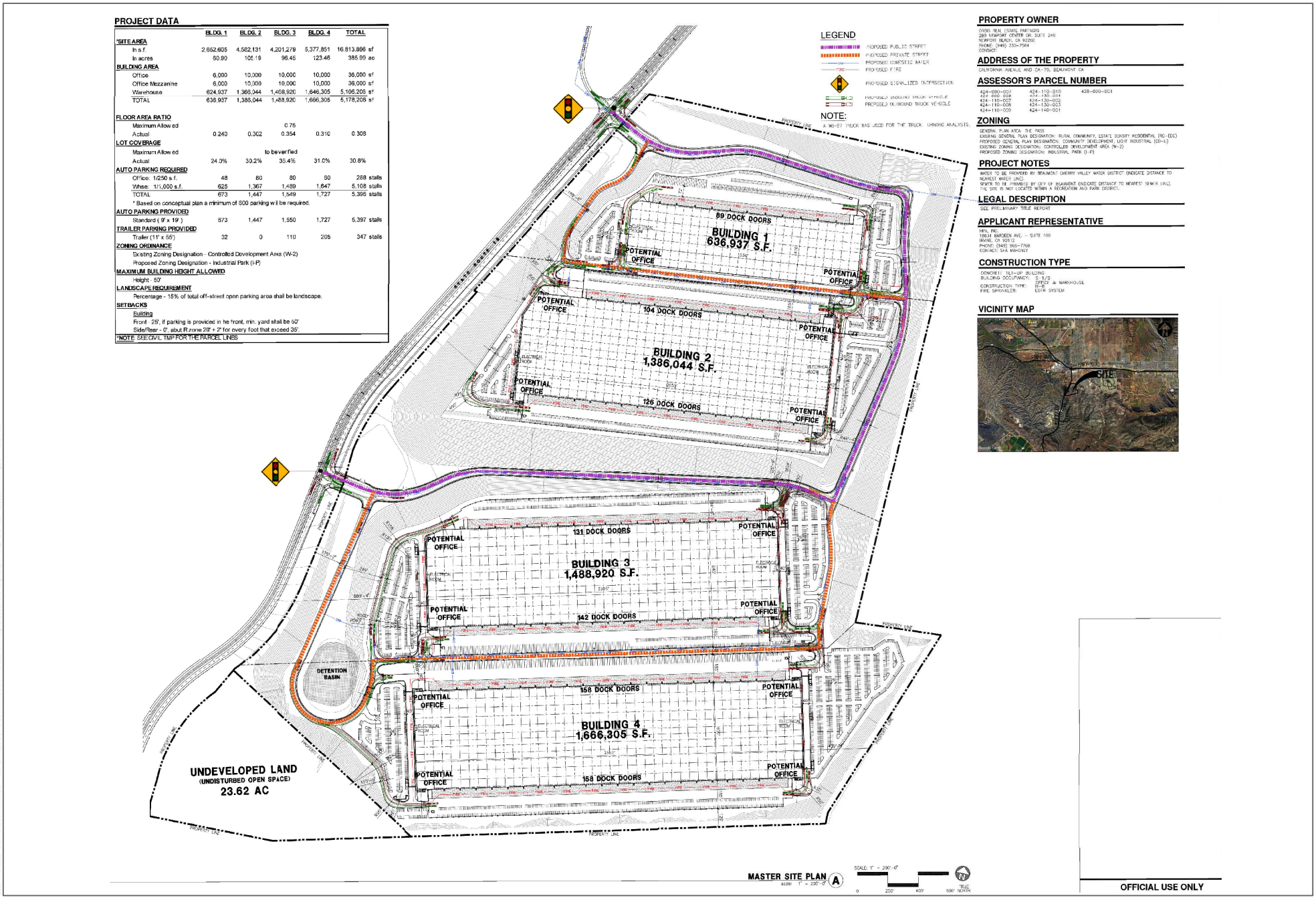

SOURCE: HPA 2025

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0 425 850 Feet

FIGURE 4

Site Plan

Beaumont Heights Fire Protection Plan

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2 Project Site Risk Analysis

2.1 Field Assessment

A field assessment of the Beaumont Heights Business Centre Project area was conducted on April 18, 2025 in order to confirm/acquire Project site information, document existing conditions, and to determine potential actions for addressing the protection of the Project's structures. While on the Project site, Dudek's Fire Protection Planner assessed the area's topography, natural vegetation and fuel loading, surrounding land use and general susceptibility to wildfire. Among the field tasks that were completed are:

- Vegetation estimates and mapping refinements
- Fuel load analysis
- Topographic features documentation
- Photograph documentation
- Confirmation/verification of hazard assumptions
- Ingress/egress documentation.
- Nearby Fire Station reconnaissance

Field observations were utilized to augment existing Project site data in generating the fire behavior models and formulating the recommendations detailed in this report.

2.2 Project Site Characteristics and Fire Environment

Fire environments are dynamic systems and include many types of environmental factors and Project site characteristics. Fires can occur in any environment where conditions are conducive to ignition and fire movement. Areas of naturally vegetated open space are typically comprised of conditions that may be favorable to wildfire spread. The three major components of fire environment are topography, climate, and vegetation (fuels). The state of each of these components and their interactions with each other determines the potential characteristics and behavior of a fire at any given moment. It is important to note that wildland fire may transition to urban fire if structures are receptive to ignition. Structure ignition depends on a variety of factors and can be prevented through a layered system of protective features including fire resistive landscapes directly adjacent to the structure(s), application of known ignition resistive materials and methods, and suitable infrastructure for firefighting purposes. Understanding the existing wildland vegetation and urban fuel conditions on and adjacent to the Project site is necessary to understand the potential for fire within and around the Project site.

The following sections discuss the Project site characteristics, local climate, and fire history within and surrounding the Project site. The Beaumont Heights Business Centre Project is similar concerning topography, vegetative cover, and proximity to adjacent residential areas, available access, and planned use. The following sections discuss the characteristics of the Project site at a regional scale. The intent of evaluating conditions at this macro-scale is providing a better understanding of the regional fire environment, which is not constrained by property boundary delineations.

2.2.1 Topography

Topography influences fire risk by affecting fire spread rates. Typically, steep terrain results in faster fire spread up-slope and slower fire spread down-slope in the absence of wind. Flat terrain tends to have little effect on fire spread, resulting in fires that are primarily influenced by wind. The Project site is characterized by being relatively flat in the northern portions of the Project site, while the southern portions of the Project site contain rugged steep ridges and valleys. The elevations on the Project site range from approximately 2,700 feet above mean sea level (amsl) in the northeastern corner of the Project site to approximately 2,300 feet amsl in the southwestern portion of the project site.

2.2.2 Climate

Throughout southern California, and specifically at the Project site, climate has a large influence on fire risk. The climate of Riverside County is typical of a Mediterranean area, with warm, dry summers and cold, wet winters. Temperatures average (average annual) around 61°F and reach up to 100°F. Precipitation has been averaging less than 16 inches and typically occurs between December and March. The prevailing wind is an on-shore flow between 7 and 11 mph from the Pacific Ocean.

Fires can be a significant issue during summer and fall, before the rainy period, especially during dry Santa Ana wind events. The seasonal Santa Ana winds can be particularly strong in the Project area as warm and dry air is channeled through the San Gorgonio Pass from the dry, desert land east of the Project site. Although Santa Ana events can occur anytime of the year, they generally occur from early fall to early spring and peak in December and January (Martin and Rafferty 2025). Santa Ana winds may gust up to 75 miles per hour (mph) or higher. This phenomenon markedly increases the wildfire danger and intensity in the Project area by drying out and preheating vegetation (fuel moisture of less than 5% for 1-hour fuels is possible) as well as accelerating oxygen supply, and thereby, making possible the burning of fuels that otherwise might not burn under cooler, moister conditions.

2.2.3 Vegetation

2.2.3.1 Fuels (Vegetation)

The Project property and surrounding areas primarily support non-native grasslands/ruderal vegetation, chamise chaparral, southern mixed chaparral, and disturbed habitat. Vegetation types were derived from an on-site field assessment of the Project site. The majority of the slopes adjacent to the Project site are vegetated with chaparral and grasses. The vegetation cover types were assigned corresponding fuel models for use during Project site fire behavior modeling. Section 3.0 describes the fire modeling conducted for the Project Area.

2.2.3.2 Vegetation Dynamics

The vegetation characteristics described above are used to model fire behavior, discussed in Section 3.0 of this FPP. Variations in vegetative cover type and species composition have a direct effect on fire behavior. Some plant communities and their associated plant species have increased flammability based on plant physiology (resin content), biological function (flowering, retention of dead plant material), physical structure (bark thickness, leaf size, branching patterns), and overall fuel loading. For example, non-native grass dominated plant communities become seasonally prone to ignition and produce lower intensity, higher spread rate fires. In comparison, sage

scrub can produce higher heat intensity and higher flame lengths under strong, dry wind patterns, but does not typically ignite or spread as quickly as light, flashy grass fuels.

As described, vegetation plays a significant role in fire behavior and is an important component to the fire behavior models discussed in this report. A critical factor to consider is the dynamic nature of vegetation communities. Fire presence and absence at varying cycles or regimes disrupts plant succession, setting plant communities to an earlier state where less fuel is present for a period of time as the plant community begins its succession again. In summary, high frequency fires tend to convert shrublands to grasslands or maintain grasslands, while fire exclusion tends to convert grasslands to shrublands, over time. In general, biomass and associated fuel loading will increase over time, assuming that disturbance (fire, grazing, or grading) or fuel reduction efforts are not diligently implemented.

It is possible to alter successional pathways for varying plant communities through manual alteration. This concept is a key component in the overall establishment and maintenance of the proposed fuel modification zones on-site. The fuel modification zones on the Project site will consist of parking lots, roadways, irrigated and maintained landscapes, and thinned native fuel zones that will be subject to regular "disturbance" in the form of maintenance and will not be allowed to accumulate excessive biomass (live or dead) over time, which results in reduced fire ignition, spread rates, and intensity. Conditions adjacent to the Project's footprint (outside the fuel modification zones), where the wildfire threat will exist post-development, are classified as low to heavy fuel loads due to the range of fuels including grass and heavy chapparal.

2.2.4 Fire History

Fire history is an important component of an FPP. Fire history data provides valuable information regarding fire spread, fire frequency, most vulnerable areas, and significant ignition sources, amongst others. In turn, this understanding of why fires occur in an area and how they typically spread can then be used for pre-planning and designing defensible communities.

Fire history represented in this FPP uses the Fire and Resource Assessment Program (FRAP) database. FRAP summarizes fire perimeter data dating to the late 1800s, but which is incomplete due to the fact that it only includes fires over 10 acres in size and has incomplete perimeter data, especially for the first half of the 20th century (Syphard and Keeley 2016). However, the data does provide a summary of recorded fires and can be used to show whether large fires have occurred in the Project area, which indicates whether they may be possible in the future.

Appendix B – Project Vicinity Fire History exhibit, presents a graphical view of the Project area's recorded fire history. As presented in the exhibit, there have been 97 fires recorded to have burned within five miles of the Project site since 1900 by CALFIRE in their FRAP database (FRAP 2024)[2]. Recorded wildfires within five miles range from approximately 10.5 acres to approximately 40,176.8 acres (2006 Esperanza Fire). Approximately 11 fires have burned onto a portion of the Project site including the recent Rabbit Fire that burned onto the site in July 2023. Based on an analysis of the CAL FIRE FRAP fire history data set, specifically the years in which the fires burned, the average interval between wildfires in the area (includes areas up to roughly 5 miles from the Project site) was calculated to be one year with intervals ranging between zero and fifteen years. It should be noted that the longer end of this interval is from the first half of the 20th century, where the database is incomplete. Based on this analysis, it is expected that wildfire(s) that could impact the Project may occur, if weather conditions coincide roughly every year with the realistic possibility of shorter or longer interval occurrences, as observed in the fire history records.

[2] Based on polygon GIS data from CAL FIRE's FRAP, which includes data from CAL FIRE, USDA Forest Service Region 5, BLM, NPS, Contract Counties and other agencies. The data set is a comprehensive fire perimeter GIS layer for public and private lands throughout the state and covers fires 10 acres and greater between 1878–2024.

2.3 Analysis of Wildfire Risk from Adding New Development

Humans (i.e., human related activities or human created features, services (i.e., powerlines and electrical equipment), or processes) are responsible for the majority of California wildfires (Syphard et al. 2007, 2008; Romero-Calcerrada et al. 2008). Certain human activities result in sparks, flames, or heat that may ignite vegetative fuels without proper prevention measures in place. These ignitions predominantly occur as accidents, but may also be purposeful, such as in the case of arson. Equipment and powerlines cause a significant number of fires in Riverside County. After that, roadways are a particularly high source for wildfire ignitions due to high usage and vehicle-caused fires (catalytic converter failure, overheated brakes, dragging chains, tossed cigarette, and others) (Romero-Calcerrada et al. 2008). In Southern California, the population living at, working in, or traveling through the wildland urban interface is vast and provides a significant opportunity for ignitions every day. However, it is a relatively rare event when a wildfire occurs, and an even rarer event when a wildfire escapes initial containment efforts. Approximately 90 to 95% of wildfires are controlled below 10 acres (CAL FIRE 2019; Santa Barbara County Fire Department 2019).

Syphard and Keeley (2015) summarize all wildfire ignitions included in the CAL FIRE Fire and Resource Assessment Program (FRAP) database dating back over 100 years. They found that equipment-caused fires were by far the most numerous – and these also accounted for most of the area burned – followed closely by the area burned by powerline fires. Ignitions classified as equipment caused frequently resulted from exhaust or sparks from power saws or other equipment with gas or electrical motors, such as lawn mowers, trimmers, or tractors. Customized, project-specific vegetation fuel modification zones (FMZs) are crucial as the strategic design and placement of fuels treatments can disrupt or slow fire spread, reduce fire intensity, and facilitate fire suppression within a landscape (Braziunas et al. 2021). This is true regardless of the direction a vegetation fire may be burning – whether toward a development or from within a development. The risk of a structure being destroyed is significantly lower when defensible space is implemented on both shallow and steep properties (Syphard et al. 2014). Shallow properties have a 0% to 9% slope with a mean of 8%, while steep properties have a 9% to 40% slope with a mean of 27%. At a minimum, managing defensible space can reduce risk across multiple scales by damping fire risk and reducing the impact of fire, which in turn reduces annual fire risk (Braziunas et al. 2021).

Further, the requirement that all structures include interior fire sprinklers significantly reduces the likelihood that a building fire spreads to the point of flashover, where a structure will burn beyond control and produce embers. Interior sprinklers are very efficient, keeping fires to the room of origin, or extinguishing the fire before the responding firefighters arrive. Similarly, the irrigated fuel modification zones are positioned throughout the Project site as well as on the perimeter of the structures. Irrigated zones include plants with high internal moisture and spacing between plants and plant groups that 1) make it difficult to ignite and 2) make it difficult for fire to spread plant to plant. Lastly, additional humans on the site result in fast detection of fires, a key in limiting the growth of fires beyond the incipient stage.

As discussed in detail throughout this FPP, the Project site is a planned ignition-resistant industrial development designed to include professionally managed and maintained fire protection components, modern fire code compliant safety features, and specific measures provided where ignitions are most likely to occur (such as roadways). Therefore, the development of the Project site would not be expected to materially increase the risk of vegetation ignitions.

2.4 Off-site Wildfire Impacts

It is a relatively rare event when a wildfire occurs, and an even rarer event when a wildfire escapes initial containment efforts. Approximately 90 to 95% of wildfires are controlled below 10 acres (CAL FIRE 2019). Studies (Keeley & Syphard 2018; Syphard et al. 2007; Syphard & Keeley 2015) show the ignition resistance and fire safety awareness of the Project and its population influences the likelihood of fire ignitions and the potential for fire to spread off-site into adjacent wildland fuels and negatively impact existing communities. As the research indicates, humans can drive wildfire ignition risk, but not discussed, they can also reduce it. When fire protection is implemented at the parcel level and leverages ignition resistant building materials, infrastructure improvements, and landscape design the wildfire risk can be significantly reduced in the surrounding environment (Newman et al., 2013). When wildfire is planned for and incorporated into the building design, such as with the Project, it can not only withstand wildfire, but prevent it. This prevention benefits the Project and the surrounding areas by reducing the landscape level fire risk. Further, given the Project's multi-scale approach to fire protection, it is unlikely that the Project would be a significant source of ignitions and result in increased off-site impacts related to wildfire, as discussed herein.

Common ignition sources in southern California are related to powerlines and vehicles (Keeley & Syphard, 2018). Powerline-based ignitions are a major concern with respect to off-site wildfire impacts. The remaining highest likelihood of vegetation ignitions in the Project area would be related to the existing SR-79 and other roads used by Project employees. However, the Project provides roadside fuel modification along all roads it creates, so that it will be free of flammable roadside fuel beds. Ongoing maintenance along SR-79 is provided and is expected to continue, if not increase in frequency as part of overall fire reduction efforts not within the control of the Project. These efforts reduce or minimize the ability for a vehicle related spark, catalytic converter failure, or other ignition source to ignite and spread fire from the roadsides into unmaintained fuels. The Project is not expected to significantly increase the already known fire risk associated with roads and in fact the Project- and road-adjacent fuel modification would aid in reducing the preexisting risk. Interior roadways are also not expected to result in significant vehicle ignitions. The on-site roadways would comply with all fire department access requirements and be adjacent to fuel modification. Therefore, even if ignition were to occur on the Project interior roadways it is highly unlikely it would spread beyond the Project site and due to the level of hardscape and the adjacent fuel modifications areas, would result in patchy and slow fire spread and reduced fire intensity.

Reducing WUI exposure can address protection of a wide range of highly valued resources and can offer protection to critical resources, habitat communities, and landscapes (Scott et al., 2016). Despite the potential for more frequent fire ignitions from developments, when developments are planned accordingly, such as the Project, the fuel availability and fuel continuity decrease, while the probability of fire suppression increases (Fox et al., 2018). This is a result of planned alterations to fuel, increased ignition resistant construction, enhanced fire protection features, higher wildfire risk awareness, and maintenance of fire protection features. The dual benefit of building a fire-hardened development, like the Project, is that the same features that protect the development from wildfire also play a significant role in protecting wildlands and surrounding areas from Project-related fires.

2.4.1 Vegetation management

A study in southern Italy found that the ignition potential of an area was significantly influenced by landcover types and human drivers were low or inconsistent (Elia et al., 2019). Urban interfaces with shrubland-dominated vegetation were found to be more fire-prone than those with grasslands or other natural spaces (Elia et al., 2019).

The Project area is a mixture of shrublands, grasslands, and disturbed habitats. All of the existing fuel on the site and within FMZ areas will be eliminated, displaced by the structures, or converted into hardscape/paving or landscaped areas that are modified to reduce fuel densities that are managed and maintained. The fuel conditions will be addressed through various vegetation management techniques, such as fuel modification zones (FMZs). The original intent of FMZs, also known as defensible space, was to protect natural resources from fires in developed areas and have since evolved to protect communities and structures. In an FMZ, combustible vegetation would be removed and/or modified and partially or totally replaced with more appropriately spaced drought-tolerant, fire-resistant plants. The goal is to provide a managed area where fire spread is not facilitated toward the Project or away from the Project into wildland areas. Fuel modification works by redistributing the fire risk in a landscape and altering the interaction between fire, fuels, and weather (Cochrane et al., 2012). FMZs typically target surface fires but can also reduce the likelihood of canopy fires, lower ember cast, and have a shadow effect on the untreated landscape by lowering the probability of burning and the potential fire size (Cochrane et al., 2012). As a result, the risk of a structure being destroyed, whether from a fire from within the development or outside the development, is significantly lower when defensible space is implemented.

However, long-term protection of the development and the surrounding area is dependent on the maintenance of fuel modification as even fire-safe designs can degrade over time. To alleviate this the Project will conduct regular assessments of the FMZs. During this maintenance, dead and dying material and undesirable plants will be removed. Thinning will also be conducted as necessary to maintain plant spacing and fuel densities. This will keep the FMZs and landscaped areas in a highly fire resistive condition free of accumulated flammable debris and plants.

Fuel treatments and defensible space do more than just protect structures. When they are a component of a place-based fire-hardened design, such as the Project, they can not only serve to protect structures from wildfire but act as a buffer for natural areas and surrounding communities. These features will further reduce the potential for wildfire in open space areas and potential impacts on surrounding communities.

2.4.2 Firefighter Response

As discussed in Section 4, the Project is not anticipated to have a negative impact on response capacity. Further, the on-site roads would be able to provide sufficient access for fire apparatus in a high-risk area. The Project also provides water supply and fire flow which are critical resources in firefighting. The Project defensible space areas will allow firefighters to safely position themselves at the development edge and begin tactical protection efforts (Warziniack et al., 2019). This allows firefighters to not only readily protect structures and reduce the likelihood of building ignition but also gives them a safe position to respond to off site wildfires. Using the Project's fire protection features firefighters would be able to use the Project as a tactical resource for protecting open space areas, whether it be from on-site or off-site fires. The Project would create additional access for fire apparatuses that were not previously existing. Enhancing firefighters' ability to respond to an incident increases their ability to suppress a fire whether both on-site and off-site. The presence of on-site fire resources increases response capacity and could be the difference between a small fire or a full conflagration.

2.4.3 Ignition Resistant/Noncombustible Construction

The WUI fire problem is structures lacking ignition resistant features (i.e., ember resistant vents, interior sprinklers); therefore, the best mitigation is to reduce the likelihood of building ignition occurring (Zhou, 2013). Structural characteristics play a large role in whether a building burns, which is important in WUI environments as structures also serve as fuel (Gorte, 2011). The benefit of structure-based mitigation is that it not only lowers the on-site risk

but also lowers the risk of wildfire across a landscape (Mockrin et al., 2020). In WUI areas, this is because structures are also fuels that can spread a fire into open space. With the incorporation of ignition-resistant construction, the likelihood of structural ignition occurring within the Project area is minimized. The Project buildings will be made from concrete tilt-up panels that are non-combustible from direct wildfire flames, heat, and embers. This lowers the threat of on-site fires impacting off-site areas as the structures themselves are very unlikely to act as fuel. While the Project includes vent coverings to prevent ember penetration the Project buildings will also include NFPA 13 commercial automatic sprinklers in every building. This is crucial in preventing off-site impacts as embers can also be generated by a structure fire and can be blown over the fuel modification into native fuels. Automatic sprinklers can isolate a fire to the point of origin, limit its ability to spread to the rest of the building, and even extinguish a fire before the responding firefighters arrive, thus damping the likelihood of ember production. Industrial sprinklers are structure protection level sprinklers that have an extremely high success rate of controlling or suppressing interior structure fires. This also reduces impacts on fire response capacity as the automatic sprinklers will allow firefighters to focus on reducing additional ignitions beyond the point of origin.

Structure design, such as the Project's, is crucial in protecting an area against wind-driven fires. The Project provides features that not only prevent fire intrusion but prevent structure fires from escaping into off-site areas. This allows the Project to not only protect the immediate area but the surrounding environment.

2.4.4 Shelter in Place Capability

Sheltering-in-place is the practice of going or remaining indoors during or following an emergency event. This procedure is recommended if there is little time for the public to react to an incident and it is safer for the public to stay indoors for a short time rather than travel outdoors. According to common Emergency Operations Plan language, shelter-in-place is an approach that has been used and is actively contemplated for emergencies, including wildfires. Shelter-in-place advises people to stay secure at their current location.

Consistent with the Project's approach, this tactic shall only be used if an evacuation will cause a higher potential for loss of life. Consideration should be given to assigning incident personnel to monitor the safety of citizens remaining in place. The concept of shelter-in-place is an available option in those instances where physical evacuation is impractical. This procedure is particularly effective for concrete industrial buildings. Sheltering-in-place provides a safe haven within the impacted area.

This Fire Protection Plan provides significant evaluation and conclusions regarding the shelter-in-place capability of the Project's buildings. Among other things, the Project has been designed to include ignition-resistant structures with the use of non-combustible construction materials (e.g., concrete), effective defensible space and fuel management zones, ember protection, and other redundant structures, infrastructure, building code, and water supply and flow requirements established as containing adequate protective features to act as temporary shelters during wildfires. All the on-site structures could be utilized for temporary refuge during a wildfire. In addition, there may be protected open-air areas that would be enhanced to serve as temporary sheltering sites as a contingency plan if evacuation is considered undesirable. These sites would be designated with input from RCFD and may include green spaces, leeside of buildings, or other protected areas.

Sheltering-in-place also has many advantages because it can be implemented immediately, allowing people to remain in their familiar surroundings, and providing individuals with everyday necessities such as telephone, radio, television, food, and clothing. However, the amount of time people can stay sheltered-in-place is dependent upon

availability of food, water, medical care, utilities, and access to accurate and reliable information. It is not anticipated that any wildfire-related shelter-in-place action would require longer than a few hours of on-site refuge.

The decision on whether to evacuate or shelter-in-place is carefully considered with the timing and nature of the incident. Sheltering-in-place is the preferred method of protection for people that are not directly impacted or in the direct path of a hazard. This will reduce congestion and transportation demand on the major transportation routes for those that have been directed to evacuate by police or fire personnel. Like with most new developments that incorporate ignition resistant construction, wide fuel modification zones, ember protection, and fire defensibility throughout, responding fire and law enforcement personnel will be able to direct people to temporarily refuge on-site in designated buildings in the rare situation where shelter-in-place is determined to be safer than evacuating.

Shelter-in-place at this location in the planned structures will also be an option available to emergency managers during a wildfire event. A shelter-in-place plan will be prepared and provided to all on-site personnel outlining the actions to take if a shelter in place notification is provided by emergency management sources.

The Project buildings will be constructed of concrete which is non-combustible and highly resistant to heat. Because of the concrete/ignition resistant construction, fuel modification zone setbacks and the type of lower fire intensity vegetative fuels in the vicinity of the site, sheltering in place is considered to be a safe option if a fast-moving wildfire precludes complete evacuation of the Project site. The heat flux produced by the nearest unmaintained vegetative fuels is not at a high enough temperature to ignite a concrete building even if it is directly next to the building. In this case, the heat would dissipate rapidly in the provided building setbacks that range between 305 and 1050 feet, and the concrete structures would be capable of absorbing any residual heated air that may intersect with the buildings. While there is potential for vehicles including 18-wheelers to be parked within this setback, embers unlikely to have sufficient thermal output to ignite the largely non-combustible vehicles under ordinary conditions and the lack of vegetative fuels in the setbacks eliminates the “ladder” that would otherwise allow embers to ignite fine combustible vegetation, which could then spread to thicker vegetation, and ultimately the vehicles. The primary concern is anticipated to be with smoke and air quality rather than exposure to flames and heated air. Measures to safely refuge persons within the buildings and minimize smoke and air quality issues would be enacted in this scenario. For example, when wildfire ignites, it is common for HVAC systems to be turned off and they can be fitted with sensors that turn them off automatically when smoke is detected. This minimizes the potential for drafting smoke through the ventilation system into the buildings.

Project Design Feature: The Project will include features to turn off the HVAC system when smoke is detected or will prepare an emergency response plan that directs this action to be taken if wildfire produces smoke that is impacting the Project site.

Most of the primary components of the Project’s layered fire protection system are required by Fire and Building codes, because they have been tested in the lab and in real-time wildfires and found to result in saved structures. They are worth listing because they have been proven effective for minimizing structural vulnerability to wildfire. They also make shelter-in-place possible as an evacuation contingency option when evacuation is not possible.

Even though current Building and Fire Codes require these measures, at one time, many of them were used as mitigation measures for buildings in fire hazard areas, because they were known to reduce structure vulnerability to wildfire. These measures were adopted into the 2007 California Building Code and have been retained and enhanced in code updates since then. The following Project features are required for new development in fire hazard areas and would form the basis of the system to provide adequate access by emergency responders and provide the protection necessary to minimize structural ignitions:

- Application of the latest adopted ignition-resistant building codes.
  - Non-flammable roofs, which would be Class "A" listed and fire-rated roof assembly, installed per manufacturer's instructions, to approval of the City. Roofs would be made tight with no gaps or openings on ends or in valleys, or elsewhere between roof covering and decking, in order to prevent intrusion of flames and embers. Any openings on ends of roof tiles would be enclosed to prevent intrusion of burning debris. When provided, roof valley flashings would not be less than 0.019 inch (No. 26 gage galvanized sheet) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of 72 pound ASTM 3909 cap sheet running the full length of the valley.
- Exterior wall coverings are to be non-combustible form in place concrete.
- Multipane glazing with a minimum of one tempered pane.
- Ember-resistant vents (recommend BrandGuard, O'Hagin, or similar vents).
- Interior, automatic fire sprinklers to code for occupancy type.
- No eaves or soffits.
- There would be no use of paper-faced insulation or combustible installation in attics or other ventilated areas.
- There would be no use of plastic, vinyl (with the exception of vinyl windows with metal reinforcement and welded corners), or light wood on the exterior.
  - Any vinyl frames to have welded corners and metal reinforcement in the interlock area to maintain integrity of the frame certified to ANSI/AAMA/NWWDA 101/I.S 2 97 requirements.
- Skylights to be tempered glass.
- Rain gutters and downspouts to be non-combustible. They would be designed to prevent the accumulation of leaf litter or debris, which can ignite roof edges.
- Doors to be of approved noncombustible construction or would be solid core wood having stiles and rails not less than 1 3/8 inches thick or have a 20-minute fire rating. Doors to comply with City Building Code.
- There would be no combustible awnings, canopies, or similar combustible overhangs.
- No combustible fences to be allowed within 5 feet of structures.
- All chimneys and other vents on heating appliances using solid or liquid fuel, including outdoor fireplaces and permanent barbeques and grills, to have spark arrestors that comply with the City Fire Code. The code requires that openings would not exceed 1/4-inch. Arrestors would be visible from the ground.
- Modern infrastructure, access roads, and water delivery system.
- Maintained FMZs.

Notably, interior fire sprinklers, which would be provided in all structures (required by code since 2010), have an extremely high reliability track record (NFPA 2021) of controlling fire in 96% of reported fires, and statistics indicate that fires in structures with sprinklers resulted in 82% lower property damage and 68% lower loss of life (Hall 2013). NFPA 13 fire sprinklers are designed for structure protection and life safety. For wildland fire defense, should embers succeed in entering a structure, sprinklers provide an additional layer of life safety and structure protection.

Sheltering In Place as an Active Emergency Option at Beaumont Heights Business Centre

Sheltering in place or providing temporary refuge when evacuation is considered undesirable is not a new idea. Sheltering in place has been a useful tool in the emergency management toolbox since the 1950's. In some wildfire scenarios, temporarily sheltering in a protected structure is safer than evacuating. Huntzinger (2010) states that:

"If sheltering in place can provide the community with the same level of protection from an emergency incident as mass evacuation, this will be the recommended practice to use." Many civilian deaths have occurred when the population evacuated late and was exposed to wildfire on unprotected roadways (Braun, 2002, CFA 2004). By contrast, fire hardened communities/projects that have implemented similar fire protection, setback, and building standards have fared well in fire events, making them suitable for temporary shelter. Developments constructed in accordance with modern fire-safe development standards also survived the 2003 Simi Fire, the 2008 Freeway Complex Fire, and the 2020 Silverado Fire without a single building lost. Nasiatka (2003) points out that another advantage to sheltering in place in an appropriately protected location is that there would be a substantial reduction in the number of evacuees that would need to be managed, allowing those evacuees at greater risk (i.e., in older, less protected communities) to more quickly evacuate.

2.4.5 Wildfire Risk Awareness Education

The Project includes an education awareness program that is a key piece in wildfire prevention in the area (Steffey et al., 2020). This program will provide wildfire information for the area and create greater risk awareness for occupants and their employees. The wildfire education program will be facilitated by the business owners of the Project and will disclose the potential wildfire risk and the requirements of the FPP. The educational program will also include information regarding the necessary landscape maintenance and structural-based fire protection features. Having ongoing education included in the Project creates a heightened level of wildfire risk awareness and fire protection measures. This benefits both the Project and the surrounding areas as people would be more aware of the wildfire risk and potential impacts. Further, it decreases the likelihood the Project occupants and users would cause an uncontrolled ignition, and they would be aware of what steps to take if they observe an ignition. As such the impact on off-site areas would be further lowered by reducing the probability of ignition.

As described above it is not as simple to say development in areas with high fire hazards will equate to increased wildfire risk. It is possible to develop in these areas when fire protection is incorporated into Project design and create a site that is not only hardened against fire but designed to prevent fires. The dual benefit of creating a development that can prevent fire is that it offers protection to the surrounding communities and the environment. The requirements and recommendations outlined in the FPP have been designed specifically for the proposed construction in the Project's location and can significantly reduce the potential threat to off-site areas.

3 Anticipated Fire Behavior

3.1 Fire Behavior Modeling

Following field data collection efforts and available data analysis, fire behavior modeling was conducted to document the type and intensity of fire that would be expected adjacent to the Project site given characteristic features such as topography, vegetation, and weather. Dudek utilized BehavePlus software package version 6 (Andrews, Bevins, and Seli 2008) to analyze potential fire behavior for the northern, eastern, and western edges of the Project site, with assumptions made for the pre- and post-Project slope and fuel conditions. Results are provided below and a more detailed presentation of the BehavePlus analysis, including fuel moisture and weather input variables, is provided in Appendix C, Fire Behavior Modeling Summary. BehavePlus modeling is described below followed by the fire spread modeling details.

3.2 Fire Behavior Modeling Analysis

An analysis was conducted to evaluate both pre- and post- Project vegetation fire behavior variables and to objectively predict flame lengths, intensities, and spread rates for four pre- proposed Project scenarios were evaluated, including two average summer weather conditions (southwest of the proposed Project site and west of the Project site) and two extreme weather offshore wind condition (north and east of the proposed Project site). Additionally, all of the scenarios were run for post-project conditions. These fire scenarios incorporated observed fuel types representing the dominant vegetation representative within and adjacent to the development site, in addition to slope gradients, wind, and fuel moisture values for both the 50th percentile weather (summer, on-shore and off-shore winds) and the 97th percentile weather (fall, off-shore winds). Modeling scenario locations were selected to better understand different fire behavior that may be experienced on or adjacent to the site.

To support the fire behavior modeling efforts conducted, a Dudek Fire Protection Planner analyzed the different vegetation types observed on and adjacent to the site and were classified into the aforementioned numeric fuel models. As is customary for this type of analysis, the terrain, and fuels directly adjacent to the site and proposed fuel modification zones (FMZ) are used for determining flame lengths and fire spread. Vegetation types, which were derived from the field assessment, were classified into fuel models. Fuel models are selected by their vegetation type, fuel stratum most likely to carry the fire, and depth and compactness of the fuels. Fire behavior modeling was conducted for vegetative types that are both on and adjacent to the proposed development. Fuel models were also assigned to illustrate post-Project fire behavior changes. Fuel models were selected from Standard Fire Behavior Fuel Models: a Comprehensive Set for Use with Rothermel's Surface Fire Spread Model (Scott and Burgan 2005). Fuel models were also assigned to the fuel FMZs to illustrate post-Project fire behavior changes. Based on the anticipated existing and post-Project vegetation conditions, five different fuel models were used in the fire behavior modeling effort presented herein. Fuel model attributes are summarized in Table 1.

Table 1. Fuel Model Characteristics

Fuel Model Assignment	Vegetation Description	Location	Fuel Bed Depth (Feet) [1]
Existing Fuel Model Characteristics			
GR1	Short, sparse dry climate grass	Represents the annual grasslands on and off the proposed Project site	0.4
GR2	Low load dry climate grass	Represents the annual grasslands on and off the proposed Project site	1
GS1	Low load dry climate grass-shrub	Represents the annual grass and scrub on and off the proposed Project site	0.9 ft
GS2	Moderate load dry climate grass-shrub	Represents the annual grass and scrub on and off the proposed Project site	1-3 ft
SH2	Moderate load dry climate shrub	Represents the California sage scrub on and off the Project site	1 ft
SH5	High Load, Dry Climate Shrub	Represents the dense chapparal on and off the Project site	4 ft – 5 ft
Post-Development Fuel Model Characteristics			
FM8	Compact Litter	Onsite Zone 1 and 2 fuel modification	0.2 ft.
GR2	Low load dry climate grass	Landscaped area surrounding the developed footprint within Project boundary	1
GS2	Moderate load dry climate grass-shrub	Off site grassland and shrubs adjacent to Project site	1-3 ft
SH2	Moderate load dry climate shrub	Off site California sage scrub fuels adjacent to Project site	1 ft
SH5	High load, dry climate shrub	Off site scrub and chapparal fuels adjacent to Project site	6 ft
NB	Non-burnable	Paved areas throughout the proposed Project site.	0 ft.

Note:

[1] Listed fuel bed depths are a reflection of the fuel models that best depict the vegetation in and around the Proposed Project site and not an exact measure of local vegetation (Anderson 1982; Scott & Burgan 2005).

A total of four existing conditions fire modeling scenarios were completed for the development area with the same conditions modeled for post Project scenarios as well. These sites were selected based on the possibility of a fire approaching from these directions during an average on-shore weather pattern (existing conditions Scenarios 1 & 2) and a Santa Ana wind-driven fire event (existing conditions Scenarios 3 & 4). Fuel modification includes the establishment of Zones 1 and 2 that progressively reduce fuels from the development boundary to the perimeter of structures, providing a minimum of 35 feet of fuel modification for all structures.

Table 2 summarizes the weather and wind input variables used in the BehavePlus modeling process.

Table 2. Variables Used for Fire Behavior Modeling

Model Variable	Summer Weather (50th Percentile)	Peak Weather (97th Percentile)
Fuel Models	GR1, GR2, GS1, SH2	GR1, GR2, GS1, GS2, SH2, SH5
1 h fuel moisture	4%	1%
10 h fuel moisture	5%	2%
100 h fuel moisture	8%	5%
Live herbaceous moisture	35%	30%
Live woody moisture	70%	60%
20 ft. wind speed	16 mph (sustained winds)	30 mph (sustained winds); wind gusts of 50 mph
Wind Directions from north (degrees)	260	75
Wind adjustment factor	0.4	0.4
Slope	4-8%	8-10%

3.3 Fire Behavior Modeling Results

The results presented in Tables 3 and 4 depict values based on inputs to the BehavePlus software and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis; rather, the models provide a worst-case wildfire behavior condition as part of a conservative approach. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location would be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

The results of fire behavior modeling analysis for pre- and post-Project conditions are presented in Tables 3 and 4, respectively. Identification of modeling run (fire scenarios) locations is presented graphically in Figure 5, BehavePlus Fire Behavior Analysis Map.

Fire Scenario Locations and Descriptions:

Pre-Project Conditions Onsite/Off site Scenarios

- **Scenario 1.** Fire flaming front approaching the proposed Project site from the open space to the south with average onshore summer winds (16 mph) being fueled on and off site by dry climate grass and some shrubs.
- **Scenario 2.** Fire flaming front approaching the proposed Project site from the open space to the east with average onshore summer winds (16 mph) as it burns through the same vegetation described in Scenario 1.
- **Scenario 3.** Fire flaming front approaching the proposed Project site from the open space to the north with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) being fueled off site by dry climate grass and some shrubs, and onsite by grasslands and scrub brush.
- **Scenario 4.** Fire flaming front approaching the proposed Project site from the open space to the west with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) as it burns through dry climate grasslands and scrub brush off and on-site.

Post Project Conditions Onsite/Off site Scenarios

- **Scenario 1.** Fire flaming front approaching the proposed Project site from the open space to the south with average onshore summer winds (16 mph) being fueled off site by low load dry climate grass and burning through irrigated managed vegetation onsite.
- **Scenario 2.** Fire flaming front approaching the proposed Project site from the open space to the east with average onshore summer winds (16 mph) as it burns through the same vegetation described in Scenario 1.
- **Scenario 3.** Fire flaming front approaching the proposed Project site from the open space to the north with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) being fueled off site by low load dry climate grass and burning through irrigated managed vegetation onsite.
- **Scenario 4.** Fire flaming front approaching the proposed Project site from the open space to the west with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) as it burns through moderate load dry climate scrub brush off site and burning through irrigated and managed vegetation on-site.

The results presented in Tables 3 and 4 depict values based on inputs to the BehavePlus software reflecting a "moment in time" and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis, but the models provide a worst-case wildfire behavior condition as part of a conservative approach. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location would be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

3.4 Fire Behavior Summary

3.4.1 Existing Conditions

The fire behavior models have been run considering pre-Project and post-Project conditions. The proposed Project site maintains similar slope and vegetation types on and off site. The fire behavior models have been run considering pre-Project and post-Project conditions. Under the summer weather conditions modeled in pre-Project Scenario 1, a fire burning uphill through the grasslands and chaparral vegetation would move at a high rate of speed (1.0 mph during sustained winds), produce moderate flame lengths (6.8 feet during sustained winds), and produce embers that could travel 0.3 miles during sustained winds. While the proposed Project would be within range of the embers being produced during this scenario, the Beaumont Heights development would include structures with ignition resistant construction methods and materials as well as an ember-resistant Zone 0 around all structures. The fire modeled in this area within Scenario 1 would produce similar results to a fire burning to the northwest of the Project site, with the same average summer weather conditions, in Scenario 2. Such a fire would burn through the grasslands and chaparral vegetation at a moderate rate of speed (1.0 mph during sustained winds), produce moderate flame lengths (6.8 feet during sustained winds), and produce embers that would travel 0.3 miles.

Under the extreme Santa Ana weather conditions modeled in pre-Project Scenario 3, a fire burning uphill through the grasslands and chaparral vegetation would move at a very high rate of speed (2.0 mph during sustained winds, 4.2 mph during gusts), produce very high flame lengths (14.6 feet during sustained winds, 20.5 mph during gusts), and produce embers that could travel 0.8 miles during sustained winds. While the proposed Project would be within range of the embers being produced during this scenario, the Beaumont Heights development would include

structures with ignition resistant construction methods and materials as well as an ember-resistant Zone 0 around all structures. The fire modeled in this area within Scenario 3 can be compared to a fire occurring to the east of the Project, under the same extreme Santa Ana weather conditions modeled in Scenario 4. Such a fire would burn through the grasslands and chaparral vegetation at a very high rate of speed (3.7 mph during sustained winds, 6.8 mph during gusts), produce very high flame lengths (34.0 feet during sustained winds, 44.8 feet during gusts), and produce embers that would travel 1.4 miles.

Table 3. RAWS BehavePlus Fire Behavior Model Results – Existing Conditions

Fire Scenarios	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/ second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Scenario 1 (Pre-Project): 16% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind south of the site				
Short, sparse grass (GR1)	2.2	33	0.3	0.1
Low load grass (GR2)	6.8	361	1.0	0.3
Low load grass-shrub (GS1)	5.0	188	0.4	0.2
Moderate load shrub (SH2)	6.5	332	0.2	0.3
Scenario 2 (Pre-Project): 3% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind west of the site				
Short, sparse grass (GR1)	2.2	33	0.3	0.1
Low load grass (GR2)	6.8	362	1.0	0.3
Low load grass-shrub (GS1)	5.0	189	0.4	0.2
Moderate load shrub (SH2)	6.5	333	0.2	0.3
Scenario 3 (Pre-Project): 10% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts north of the site (2)				
Short, sparse grass (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Low load grass (GR2)	14.7 (18.0)	1,961 (3,037)	4.0 (6.2)	0.8 (1.3)
Low load grass-shrub (GS2)	14.6 (20.5)	1,934 (4,042)	2.0 (4.2)	0.8 (1.4)
Scenario 4 (Pre-Project): 18% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts east of the site (2)				
Low load grass (GR2)	14.7 (18.0)	1,966 (3,037)	4.0 (6.2)	0.8 (1.3)
Low load grass-shrub (GS1)	10.1 (14.0)	869 (1,763)	1.5 (3.0)	0.6 (1.1)
Moderate load shrub (SH2)	11.6 (16.0)	1,167 (2,338)	0.5 (1.0)	0.7 (1.2)
High load shrub (SH5)	34.0 (44.8)	12,111 (22,049)	3.7 (6.8)	1.4 (2.4)

Notes:
1 Wind-driven surface fire.
2 Values in parentheses represent the respective output in the presence of 50 mph gusts.

3.4.2 Post-Project Condition

As previously mentioned, Dudek conducted modeling of the site for post-fuel modification zones. RCFD requires the establishment of a minimum 100-foot-wide fuel modification zones that includes irrigated zones and thinning zones; however, the project proposes project-specific on-site fuel modification zones (Zones 1 and 2) beginning at the structures and extending outward towards the property line. For modeling the post-FMZ treatment condition,

the fuel model assignment for non-native grass-shrub lands was re-classified according to the specific fuels management (e.g., irrigated, fire resistive landscaping) treatment.

Based on the BehavePlus analysis, after completion of the proposed Project, fire behavior on site would be reduced. There would no longer be the large, dispersed shrubs that could produce large flame lengths. Fire behavior through the on-site irrigated landscapes would be low with very low rates of spread during both average and extreme weather conditions. Fire behavior in fuel modification zones 1 and 2 would be similar to the mowed areas in the existing condition scenarios, and the off site Project adjacent fuels would remain similar to the moderate-shrub areas in the existing condition scenarios. Post-Project conditions in these areas would result in a reduction of up to 31 feet in flame lengths and up to 3.5 mph in spread rates. As a result of the proposed fuel modification, the fire hazard presented by the site would be reduced compared to its current state. This means reduced fire risk for project occupants. Further, the anticipated surface fire would not be anticipated to transition to any proposed structures due to their planned ignition resistance and the proposed integration of the ember-resistant Zone 0.

If any of the fires modeled in pre-Project Scenarios 1 or 2 were to spread onto the proposed Project site following development of the Project, the resulting fire would be described by post-proposed Project Scenarios 1 and 2. Post-proposed Project Scenario 1 describes a fire igniting to the southwest of the Project burning onsite during Project conditions and the adjacent off site fuels during average summer weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In onsite fuel modification zone areas that have been irrigated, mowed and maintained, there would be low flame lengths (1.5 feet during sustained winds), a low rate of spread (0.0 mph during sustained winds) and embers could travel 0.1 miles during sustained winds. Off site areas adjacent to the Project site that have not been maintained would continue to produce high flame lengths (6.5 feet during sustained winds) and move at a moderate rate of speed (0.2 mph during sustained winds) and produce embers that could travel 0.3 miles under sustained winds.

Post-proposed Project Scenario 2 describes a fire igniting to the west of the Project site burning onsite during Project conditions and the adjacent off site fuels during average summer weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In fuel modification zones and areas that have been irrigated, mowed and maintained, the fire behavior would remain the same as in Scenario 1. Off site areas adjacent to the Project site that have not been maintained would continue to produce moderate flame lengths (6.5 feet during sustained winds) and move at a low rate of speed (0.2 mph during sustained winds) and produce embers that could travel 0.3 miles under sustained winds.

If any of the fires modeled in pre-Project Scenarios 3 or 4 were to spread onto the proposed Project site following development of the Project, the resulting fire would be described by post-proposed Project Scenarios 3 and 4. Post-proposed Project Scenario 3 describes a fire igniting to the north of the Project burning onsite during Project conditions and the adjacent off site fuels during extreme Santa Ana weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In onsite fuel modification zone areas that have been irrigated, mowed and maintained, there would be low flame lengths (2.8 feet during sustained winds, 3.0 feet during gusts), a low rate of spread (0.1 mph during sustained winds, 0.2 mph during gusts) and embers could travel 0.3 miles during sustained winds. Off site areas adjacent to the Project site that have not been maintained would continue to produce moderate flame lengths (14.6 feet during sustained winds, 20.5 feet during gusts) and move at a moderate rate of speed (2.0 mph during sustained winds 4.2 mph during gusts) and produce embers that could travel 0.8 miles under sustained winds.

Post-proposed Project Scenario 4 describes a fire igniting to the east of the Project site burning onsite during Project conditions and the adjacent off site fuels during extreme Santa Ana weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In fuel modification zones and areas that have been irrigated, mowed and maintained, there would be low flame lengths (2.8 feet during sustained winds, 3.0 feet during gusts), a low rate of spread (0.1 mph during sustained winds, 0.2 mph during gusts) and embers could travel 0.1 miles during sustained winds. Off site areas adjacent to the Project site that have not been maintained would continue to produce high flame lengths (34.0 feet during sustained winds, 44.8 feet during gusts) and move at a moderate rate of speed (3.7 mph during sustained winds, 6.8 mph during gusts) and produce embers that could travel 0.4 miles under sustained winds.

Table 4. RAWS BehavePlus Fire Behavior Model Results – Post Proposed Project Conditions

Fire Scenarios	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/ second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Scenario 1 (post-Project): 16% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind south of the site				
Irrigated Area (FM8)	1.5	13	0.0	0.1
Landscaped Area (GR1)	2.2	33	0.3	0.1
Off site Project Adjacent Fuel (SH2)	6.5	332	0.2	0.3
Non-burnable	N/A	N/A	N/A	N/A
Scenario 2 (post-Project): 3% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind west of the site				
Irrigated Landscapes (FM8)	1.5	13	0.0	0.1
Landscaped Area (GR1)	2.2	33	0.3	0.1
Off site Project Adjacent Fuel (SH2)	6.5	333	0.2	0.3
Non-burnable	N/A	N/A	N/A	N/A
Scenario 3 (post-Project): 10% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts north of the site (2)				
Irrigated Landscapes (FM8)	2.8 (3.0)	55 (63)	0.1 (0.2)	0.3 (0.4)
Landscaped Area (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Off site Project Adjacent Fuel (GS2)	14.6 (20.5)	1,934 (4,042)	2.0 (4.2)	0.8 (1.4)
Non-burnable	N/A	N/A	N/A	N/A
Scenario 4 (post-Project): 18% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts east of the site (2)				
Irrigated Landscapes (FM8)	2.8 (3.0)	55 (63)	0.1 (0.2)	0.1
Landscaped Area (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Off site Project Adjacent Fuel (SH5)	34.0 (44.8)	12,111 (22,049)	3.7 (6.8)	0.4
Non-burnable	N/A	N/A	N/A	N/A

Note:
1 Wind-driven surface fire.
2 Values in parentheses represent the respective output in the presence of 50 mph gusts.

The following describes the fire behavior variables (Heisch and Andrews 2010) as presented in Tables 3 and 4:

Surface Fire:

Flame Length (feet): The flame length of a spreading surface fire within the flaming front is measured from midway in the active flaming combustion zone to the average tip of the flames.

Fireline Intensity (Btu/ft/s): Fireline intensity is the heat energy release per unit time from a one-foot-wide section of the fuel bed extending from the front to the rear of the flaming zone. Fireline intensity is a function of rate of spread and heat per unit area and is related to flame length. Fireline intensity and the flame length are related to the heat felt by a person standing next to the flames.

Surface Rate of Spread (mph): Surface rate of spread is the "speed" the fire travels through the surface fuels. Surface fuels include the litter, grass, brush, and other dead and live vegetation within about 6 feet of the ground.

The information in Table 5 presents an interpretation of the outputs for five fire behavior variables as related to fire suppression efforts. The results of fire behavior modeling efforts are presented in Tables 3 and 4. Identification of modeling run locations is presented graphically in Figure 5 of this FPP.

Table 5. Fire Suppression Interpretation

Flame Length (ft)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 to 8 feet	100-500 BTU/ft/s	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 to 11 feet	500-1000 BTU/ft/s	Fires may present serious control problems – torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

3.5 Project Area Fire Risk Assessment

Wildland fires are a common natural hazard in most of southern California with a long and extensive history. Southern California landscapes include a diverse range of plant communities, including vast tracts of grasslands and shrublands, like those found adjacent to the Project site. Wildfire in this Mediterranean-type ecosystem ultimately affects the structure and functions of vegetation communities (Keeley 1984) and will continue to have a substantial and recurring role (Keeley and Fotheringham 2003). Supporting this are the facts that 1) native landscapes, from forest to grasslands, become highly flammable each fall and 2) the climate of southern California has been characterized by fire climatologists as the worst fire climate in the United States (Keeley 2004) with high winds (Santa Ana) occurring during autumn after a six-month drought period each year. Based on this research, the anticipated growing population of Riverside County WUI areas, and the region's fire history, it can be anticipated that periodic wildfires may start on, burn onto, or spot into the Project site. The most common type of fire anticipated

in the vicinity of the Project area is a wind-driven fire from the north moving through the chaparral and sage scrub vegetation on the adjacent lands.

With the conversion of the landscape to ignition-resistant development, wildfires may still encroach upon and drop embers on the site but would not be expected to burn through the site or produce sustainable spot fires due to the lack of available fuels. Studies indicate that even with older developments that lacked the fire protections provided in the Project, wildfires declined steadily over time (Syphard, et. al., 2007 and 2013) and further, the acreage burned remained relatively constant, even though the number of ignitions temporarily increased. This is due to the conversion of landscapes to ignition resistant, maintained areas, more humans monitoring areas resulting in early fire detection and discouragement of arson, and fast response from the fire suppression resources that are located within these developing areas.

Therefore, it will be critical that the latest fire protection technologies, developed through intensive research and real-world wildfire observations and findings by fire professionals, for both ignition resistant construction and for creating defensible space in the ever-expanding WUI areas, are implemented, and enforced. The Project, once developed, would not facilitate wildfire spread and would reduce projected flame lengths to levels that would be manageable by firefighting resources for protecting the Project site's structures, especially given the ignition resistance of the structures and the planned ongoing maintenance of the entire Project site landscape.

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Figure 5 BehavePlus Analysis Map

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4 Emergency Response and Service

4.1 Emergency Response

The Project site is located within the RCFD response area, which includes Beaumont's corporate limits and the County areas within the City's sphere of influence. The City of Beaumont contracts with RCFD for emergency and administrative services. Table 6, Closest Responding RCFD Fire Stations Summary, presents a summary of the location, equipment, and staffing levels for the three closest, existing RCFD stations responding to the Project.

Table 6. Closest Responding RCFD Fire Stations Summary

Station No.	Location	Equipment*	Staffing*
66	628 Maple Avenue Beaumont, California 92223	(1) Type 1 Engine (1) Squad	5 personnel
20	1550 E. 6th Street Beaumont, California 92223	(1) Type 1 Engine (2) Type 3 Engines	9 personnel**
106	2000 Western Knolls Avenue Beaumont, California 92223	(1) Type 1 Engine	3 personnel

Notes:
* Staffing levels and equipment from Riverside County Fire Department, phone conversation with staff from Station 66, April 15, 2025.
** RCFD Station 20 staffing is 9 during the fire season but is reduced outside of fire season.

RCFD Beaumont Station 66 would currently provide an initial response to the Project site and is located at 628 Maple Avenue. Station 66 has one staffed Type 1 Engine and one staffed Squad. Secondary response would be provided from RCFD Beaumont Station 20, which is located at 1550 E. 6th Street. Beaumont Station 20 has one staffed Type 1 Engine and two staffed Type 3 Engines during the fire season. Station 20's staffing is reduced outside of the fire season. RCFD Beaumont Station 106 (the "West Side Fire Station") is located at 2000 Western Knolls Avenue. Beaumont Station 106 has one staffed Type 1 Engine. This station decreases the response times for the City's west side communities, including Olivewood, Tournament Hills, Tukwet, and the logistics centers located off of SR-60[3].

Within the area's emergency services system, fire and emergency medical services are also provided by other RCFD Fire Stations. Generally, each agency is responsible for structural fire protection and wildland fire protection within their area of responsibility. However, mutual aid agreements enable non-lead fire agencies to respond to fire emergencies outside their district boundaries. In the Project area, fire agencies cooperate under a statewide master mutual aid agreement for wildland fires. There are also mutual aid agreements in place with neighboring fire agencies and typically include interdependencies that exist among the region's fire protection agencies for structural and medical responses but are primarily associated with the peripheral "edges" of each agency's boundary.

In an effort to understand fire department response capabilities, Dudek conducted an analysis of the travel-time response coverage from the closest responding fire stations. The response time analysis was conducted using travel distances that were derived from Google road data. Travel times were calculated by applying the distance at speed

[3] INITIAL STUDY/MITIGATED NEGATIVE DECLARATION FOR THE WEST SIDE FIRE STATION PROJECT BEAUMONT, CALIFORNIA January 2022

limit formula (T=(D/S) * 60, where T=time, D=distance in miles, and S=speed in MPH) as well as the nationally recognized Insurance Services Office (ISO) Public Protection Classification Program's Response Time Standard formula (T=0.65 + 1.7 D, where T= time and D = distance) for comparison. The ISO response travel time formula discounts speed for intersections, vehicle deceleration and acceleration, and does not include turnout time. Tables 7 and 8 present tabular results of the emergency response time analysis using the distance at speed formula and the ISO formula, respectively.

Table 7. Project Emergency Response Analysis using Speed Limit Formula

RCFD Station No.	Travel Distance to Project Site	Travel Time to Project Site*	Total Response Time**
66	1.6 miles	2 minutes 44 seconds	4 minutes 44 seconds
20	2.9 miles	4 minutes 58 seconds	6 minutes 58 seconds
106	3.8 miles	6 minutes 31 seconds	8 minutes 31 seconds

Notes:

* Assumes travel distance and time to the Project site entrance for the respective fire station. Also assumes application of the distance at speed limit formula (T=(D/S) * 60, where T=time, D=distance in miles, and S=speed in MPH), a 35-mph travel speed, and does not include turnout time.

** Assumes travel distance and time to the Project site entrance for the respective fire station, and application of the distance at speed limit formula (T=(D/S) * 60, where T=time, D=distance in miles, and S=speed in MPH), a 35 mph travel speed along with dispatch and turnout time, which can add an additional two minutes to travel time.

Table 8. Project Emergency Response Analysis using ISO Formula

RCFD Station No.	Travel Distance to Project Site	Travel Time to Project Site*	Total Response Time**
66	1.6 miles	3 minutes 22 seconds	5 minutes 22 seconds
20	2.9 miles	5 minutes 35 seconds	7 minutes 35 seconds
106	3.8 miles	7 minutes 7 seconds	9 minutes 7 seconds

Notes:

* Assumes travel distance and time to the Project site into the development for the respective fire station. Also assumes application of the ISO formula, T=0.65+1.7(Distance), a 35-mph travel speed, and does not include turnout time.

** Assumes travel distance and time to the Project site into the development for the respective fire station. Also assumes application of the ISO formula, T=0.65+1.7(Distance), a 35-mph travel speed, and dispatch and turnout time, which can add an additional two minutes to travel time.

Emergency response time target thresholds include travel time along with dispatch and turnout time, which can add two minutes to travel time. The closest fire station, Station 66, could provide an initial response to the Project site within 4 minutes and 44 seconds (Speed Limit Formula) or 5 minutes and 22 seconds (ISO Formula) after departing the station. Station 20 could respond to the Project site within 6 minutes and 58 seconds (Speed Limit Formula) or 7 minutes and 35 seconds (ISO Formula) after departing the station. Station 106 could respond to the Project site within 8 minutes and 31 seconds (Speed Limit Formula) or 9 minutes and 7 seconds (ISO Formula) after departing the station. All response calculations are based on an average response speed of 35 mph and are consistent with NFPA 1710.

On March 7, 2017, the Riverside County Board of Supervisors (Board) received and filed RCFD's "Alternative Staffing Model Recommendation." The Alternative Staffing Model Recommendation was fiscally driven and developed by RCFD due to funding difficulties to retain 3-person engine companies. The RCFD FY 17-18 Service Alternatives report, dated March 7, 2017, recommends the following response times based on four Board Approved Land Use Classifications as described in Table 9:

Table 9. Land Use Classification Information with Staffing/Time Response Standards

Land Classification	Population Density	Fire Staffing Characteristics	Response Time
HEAVY URBAN	>700 per square mile	Land use includes large commercial and industrial complexes, large business parks, high-rise and wide rise community centers and high-density residential dwelling units of 10 to 20 units per acre.	5:00 minutes, 90% of the time
URBAN	>500 per square mile	Land use includes large commercial and industrial complexes, large business parks, high-rise and wide rise community centers and high-density residential dwelling units of 8 to 20 units per acre.	6:30 minutes, 90% of the time
RURAL	100 to 500 per square mile	Light industrial zones, small community centers and residential dwelling unit density of 2 to 8 units per acre.	10:30 minutes, 90% of the time
OUTLYING	<100 per square mile	Areas of rural mountain and desert, agricultural uses, small scale commercial, industrial and manufacturing, service commercial, medium industrial and low density residential dwelling units; 1 dwelling unit per acre to 1 dwelling unit per 5 acres.	17:30 minutes, 90% of the time

Source: Riverside County Fire Department FY 17-18 Service Alternatives. March 7, 2017.

Based on the Project area's inclusion of large commercial and industrial complexes, it is assumed that the Project is be classified as "Heavy Urban," with a 5.0-minute first-in fire engine response time. As previously mentioned, response to the Project site from the second closest existing Fire Station (Station 20) would achieve a 5-minute travel time to the entrance of the Project and the closest fire station, Station 66, would achieve a travel time to the Project entrance in 2 minutes and 44 seconds. Total response time would include the addition of dispatch and turnout time, which is often considered approximately 2 minutes, resulting in a total response time of 4 minutes and 44 seconds for Station 66 to the Project's entrance. By meeting the 5-minute response time, the Project will not adversely impact the overall goal achievement due to the low number of calls (discussed below) that are projected.

According to the RCFD 2016 TriData Report, units should travel to calls within the defined response time goal for the appropriate population density classification 80% of the time. As noted in the report, Station 66 was in compliance of meeting the defined response time 81.4% of the time and Station 20 was in compliance 83.9% of the time. Additionally, areas that have fewer units available or are farther from neighboring stations are more impacted than others by an increase in emergency calls. They have greater workload sensitivity–as the workload

increases, their ability to meet the demand decreases. Station 66 is considered to have a low sensitivity workload, and Station 20 is considered to have moderate sensitivity, both with the capacity for more workload[4].

4.2 Estimated Calls and Demand for Service from the Project

The following estimated annual emergency call volume generated by the Project (Industrial buildings) is based upon per capita data for 2022 from RCFD calls within their jurisdiction[5].

- Total population served: 53,036 (as of 2020 Beaumont Population, US Census Bureau)
- Total annual calls: 5,023. Per capita call generation: 0.095
- Total annual fire calls, including Structure Fire, Wildland Fire, and Other Fire calls (2.07% of total calls): 104. Per capita call generation: 0.002
- Total annual Emergency Medical Services (74.80% of total calls): 3,757. Per capita call generation: 0.071
- Total other calls, including False Alarm, Traffic Collisions, Hazardous Materials, Other Miscellaneous (23.13% of total calls): 1,162. Per capita call generation: 0.022

Using the data above, the estimated annual emergency call volume for the Project site was calculated (Table 9). In order to provide this conceptual estimate, Dudek made assumptions regarding industrial populations within the Beaumont Heights Business Centre Project. The Project's VMT analysis (Urban Crossroads, Inc 2025) estimates the total number of employees to be up to approximately 6,114 with the buildings operating up to 24 hours a day, 7 days a week. The number on-site at any given time may vary by time of day, due to employee shift work, estimated transient population and operating hours of individual businesses. Based on this information, the total maximum estimated population (which includes employees and transient use) of the Project site at any given time, is projected to be 6,114 persons, however with three shifts per day the estimate would be 2,038. Based on this population estimate, the calculated call volumes by type of call are provided in Table 10 below.

Table 10. Conceptual Calculated Call Volume

Type of Call	Per Capita Call Generation Factor	Number of Estimated Annual Calls (2,038 persons)
Total Other Calls	0.022	45
Total Fires	0.002	4
Total EMS Calls	0.071	145
Total Calls	0.095	194

As mentioned, the new industrial development will increase the call volume at a rate of a conservatively calculated 194 calls per year (4 calls per week or 16 calls per month). Fire Stations 66 and 20 combined emergency responses in 2021 totaled 7163 calls per year (2,607 and 4,556 respectively[6]), or 7.1 and 12.5 calls per day per station respectively. The level of service demand for the Project barely raises the overall call volume for the area. For perspective, five calls per day are typical in an urban or suburban area. A busy fire station company would be one with 10 to 15 or more calls per day. The expected number of potential calls per week

4 Sensitivity analysis based on RCFD 2016 TriData Report
5 2022 Riverside County Fire Department Annual Report, City of Beaumont Incidents for fiscal year 2022
6 Riverside County Fire Department Annual Report 2021

generated by the Project at full build out will be 4 calls, although the number will likely be lower than that based on the conservative nature of the population and calls per capita data used in this estimate. With additional assistance from Fire Station 106, Fire Stations 66 and 20 should not have a significant increase in call volume from the Project.

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5 Fire Safety Requirements- Infrastructure, Building Ignition Resistance, and Defensible Space

This FPP demonstrates that the Project development would comply with applicable portions of RCFD Technical Policies and Fire Prevention Standards and applicable portions of the Riverside County Municipal Code, Ordinances No. 460 and No. 787-11 and Title 8, Chapter 8.32 – Fire Code, which adopts the 2025 edition of the CFC, California Code of Regulations, Title 24, Part 9, with amendments. Furthermore, the Project will be consistent with applicable portions of Title 15, Chapter 15.04 – Building Regulations, which adopts the 2025 edition of the CBC based on the 2024 edition of the IFC as adopted and amended by RCFD, which governs the building, infrastructure, and defensible space requirements detailed in this FPP. The Project would also be subject to the provisions of section 4291 of the PRC regarding brush clearance standards around structures, the RCFD Defensible Space guidelines, and RCFD guidelines for Fuel Modification Plans. Being that the Project is in the SRA, California Code of Regulations Title 14, Fire Safe Regulations also applies. The Project will meet or exceed applicable codes or will provide alternative materials and/or methods. While these standards will provide a high level of protection to structures within the development, there are no guarantees that compliance with these standards will prevent damage or destruction of structures by fire in all cases. The following summaries highlight important fire protection features.

Prior to bringing combustible materials onto the Project site, utilities shall be in place, fire hydrants operational, an approved all-weather roadway, or an approved road surface alternative in place, and interim fuel modification zones established and approved.

A response map update, including roads and fire hydrant locations, in a format compatible with current RCFD mapping shall be provided to RCFD.

5.1 Roads

5.1.1 Access

Primary access to the Project site will be provided by Beaumont Avenue (SR-79). There will be two points of access off SR-79 onto the project site, one aligning with California Avenue in the northern portion of the Project site and the other located next to Building 3 in the southern portion of the Project site. There will be 30- to 40-foot-wide fire access roads around the perimeter of each warehouse. Roadways will provide access to within 150 feet of all portions of the structures served (2025 CFC, Section 503.1.1).

Project site access, including road widths and connectivity, will comply with the requirements of the Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A[7], which includes:

- Fire apparatus access roads, commonly referred to as fire lanes, shall be provided for every facility or building when any portion of an exterior wall of the first story is located more than 150 feet from an approved access roadway, as measured along an approved route.

[7] https://www.rvcfire.org/pdf/fire-marshal/guideline-ofm/FD%20Access%20%202023%20Guideline%20OFM-01A%20%20FINAL%201-31-2024.pdf?v=4149

- Fire apparatus access roads serving commercial or residential development shall be designed, constructed, and maintained to support the imposed loads of RVC fire apparatus with a total weight of 80,000 pounds. Apparatus weight is distributed as 55,000 pounds on tandem rear axles and 25,000 pounds on the front axle. The surface shall be designed, constructed, and maintained to provide all-weather driving capabilities.
- One road is required if any portion of an exterior wall of the first story of a building is located more than 150 feet from a fire access road. More than one road may be required when the project contains an industrial building exceeding 50,000 square feet.
- To protect fire apparatus, personnel, and equipment from damage and injury from falling debris, buildings taller than or equal to 40 feet in height require the edge of fire apparatus access roads to be located no closer than 20 to 40 feet from the building, the actual distance being a function of overall building height with consideration given to building construction, presence of openings, and other potential hazards.
- To ensure that fire apparatus mobility on properties with buildings taller than or equal to 30 feet in height is maintained at all times, Fire Truck Deployment Areas shall be provided along the road to permit fire apparatus to pass fire trucks that have outriggers extended. Consideration shall be given to the length of the road, roof and building design, obstructions to laddering, and other operational factors in determining the number, location, and configuration of Fire Truck Deployment Areas. Fire Truck Deployment Areas are typically required on at least two sides of the building. Road widths adjacent to Fire Truck Deployment Area shall be a minimum of 34 feet.
- All access roads shall comply with access road standards of a minimum clear width of 24 feet and an unobstructed vertical clearance of not less than 13 feet 6 inches. If trees are located adjacent to the fire access road, place a note on the plans stating that all vegetation overhanging the fire access road shall be maintained to provide a clear height of 13 feet, 6 inches.
- Access walkways must be a minimum of five feet in width and must be provided to all required egress doors from a building, all firefighter access doorways in buildings with high-piled storage, and the area beneath each rescue window in “R” occupancies, at a minimum. Access walkways will typically be required around the entire perimeter of a structure to facilitate control of a fire through any other available openings.
- Access walkways shall consist of a surface that lends itself to safe use during building evacuation, firefighting, and rescue efforts. Solid surface walkways such as concrete or asphalt are preferable, though alternative surfaces such as decomposed granite (DG), gravel, or grass may also be permissible. Ground covers and shrubs that prevent or impede laddering of structures are not permitted to be planted within access walkways. Where the grade itself presents a slip or fall hazard, an access walkway with a slip-resistant surface and/or stairway must be provided.

5.1.2 Surface and Grade

Fire access roads must be able to support fully loaded fire engines and be of a subtle enough grade to facilitate their travel. The surface and grade of all fire apparatus access roads associated with the Project comply with the requirements of the Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A, which includes:

- Fire apparatus access roads serving commercial or residential development shall be designed, constructed, and maintained to support the imposed loads of RVC fire apparatus with a total weight of 80,000 pounds. Apparatus weight is distributed as 55,000 pounds on tandem rear axles and 25,000 pounds on the front axle. The surface shall be designed, constructed, and maintained to provide all-weather driving capabilities.

- For fire apparatus access roads, a maximum of 6% (4 degrees) grade change is allowed for the initial 25 feet of approach or departure.
- The grade for access roads shall not exceed 14% (8 degrees). Cross-slope shall not be greater than 2.5% (1.43 degrees) for paved access roads.

5.1.3 Road Width and Clearance

Fire apparatus access roads must be of an appropriate width and clearance to facilitate the ingress and egress of engines. The width and clearance of fire access roads associated with the Project comply with the requirements of the Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A and Title 14 Minimum Fire Safe Regulations, which include:

- The minimum clear width of a fire apparatus access road is 24 feet.
- Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches. If trees are located adjacent to the fire access road, place a note on the plans stating that all vegetation overhanging the fire access road shall be maintained to provide a clear height of 13 feet, 6 inches.
- No road or road structure shall have a horizontal inside radius of curvature of less than fifty (50) feet. An additional surface width of four (4) feet shall be added to curves of 50-100 feet radius; two (2) feet to those from 100-200 feet
- No parking or other obstruction (e.g.: trash receptacles) are permitted on roads that are narrower than 32 feet in width. Parking on one side is permitted on a road that is at least 32 feet but less than 40 feet in width. Parking on two sides is permitted on a road 40 feet or more in width.

5.1.4 Aerial Fire Apparatus Access Road

Aerial fire apparatus access roads meeting the 2025 CFC requirements below exist around the perimeter of the four industrial buildings:

- Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet, approved aerial fire apparatus access roads shall be provided (CFC Section D105.1).
  - Exceptions to this requirement include buildings of Type IA, Type IB or Type IIA construction equipped throughout with an automatic sprinkler system in accordance with CFC Section 903.3.1.1 and having fire fighter access through an enclosed stairway with a Class I standpipe from the lowest level of fire department vehicle access to all roof surfaces, but must be approved by an RCFD official.
- Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet, exclusive of shoulders, in the immediate vicinity of the building or portion thereof (CFC Section D105.2).
- One or more of the required aerial fire apparatus access routes shall be located not less than 15 feet and not greater than 30 feet from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the fire code official (CFC Section D105.3). Overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the fire code official (CFC Section D105.4).

5.1.5 Fire Lane Marking

Fire lane identification will be required when it is necessary to restrict parking of vehicles to maintain the required width of fire access roads for emergency vehicle use. Fire lane markings associated with the Project will be in compliance with the Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A, which includes:

- Specific areas designated by RVC as fire lanes shall be marked with red curbs. In addition, all entrances from public streets into the area marked with fire lanes shall be posted with approved fire lane entrance signs. Other uniquely shaped spaces may be required to be designated as a FIRE LANE to prevent obstruction. This may be accomplished by outlining the FIRE LANE portion of the area with red paint and adding additional diagonal red markings within the designated area.
- "Fire Lane—No Parking" signs shall be posted immediately adjacent to each designated fire lane and at intervals not to exceed 75 feet. In addition, all entrances from public streets into the area marked with fire lanes shall be posted with fire lane entrance signs. Alternative signs must be approved through RVC – OFM.

5.1.6 Gates

Gates on private roads are permitted, but subject to the adopted Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A and Title 14 Minimum Fire Safe Regulations, which include:

- Proposed gates crossing fire apparatus access roads must be shown on the plans. Information such as the location, type of gate (e.g., swinging, sliding), dimensions, and method of operation (manual, electric) must also be provided. Typical gate designs may include sliding gates, swinging gates or arms, or guard posts with a chain traversing the opening.
- Security gates shall not be installed without approval. Where security gates are installed, they shall have an approved means of emergency operation. Approval shall be by the local authority having jurisdiction. The security gates and the emergency operation shall be maintained operational at all times.
- Gated entries located for egress and ingress of vehicles shall not be less than 24 feet clear width on not less than one side of a center median. The vertical clearance shall not be less than 13 feet 6 inches, including landscaping and/or trees or other obstructions. Roads leading up to and beyond the guard house or gate shall meet standard fire lane width requirements. Additional vehicle access gates located elsewhere on commercial property shall be a minimum of 24 feet in width.
- Gates and barriers shall be located a minimum of 46 feet from any major street. If existing conditions prevent installation of the minimum setback, documentation supporting an acceptable alternative shall be provided. The alternative solution must facilitate emergency ingress without endangering emergency response personnel, emergency apparatus, and the general public. The alternative shall be subject to review and approval.
- For gates and barriers that are not used on a frequent basis or those that are located such that they have a reasonable likelihood of being blocked by vehicles, vegetation, furniture, or other obstructions (e.g., secondary fire department vehicle ingress/egress points, gates accessed from plazas), permanent signage constructed of 18-gauge steel or equivalent shall be attached on each face of the gate or barrier that reads "FIRE LANE—NO PARKING."

- Manually operated gates and barriers shall have Knox padlocks, or weather-resistant Knox key boxes. The key box shall be placed four to five feet above the road surface at the right side of the access gate in a conspicuous location that is readily visible and accessible. The key box must be clearly labeled "FIRE DEPT." (CFC 506)

Electronically Operated Gates

- Electric gate openers shall comply with UL 325. In the event of loss of normal power to the gate operating mechanism, it shall be automatically transferred to a fail-safe mode allowing the gate to be pushed open by a single firefighter without any other actions, knowledge, or manipulation of the operating mechanism being necessary and without the use of battery back-up power; this shall be noted on the plan. The manufacturer's specification sheet demonstrating compliance with this method of operation during power loss shall be provided or scanned directly onto the plan. Should the gate be too large or heavy for a single firefighter to open manually, a secondary source of power by means of an emergency generator or a capacitor with enough reserve to automatically and immediately open the gate upon loss of primary power shall be provided.
- The gate control for electronic gates shall be operable by a Knox emergency override key switch (with dust cover). The key switch shall be placed between 42" and 48" above the road surface at the right side of the access gate within two feet of the edge of the road. The key switch shall be readily visible and unobstructed from the fire lane leading to the gate. The key switch shall be clearly labeled "FIRE DEPT."
- Upon activation of the key switch, the gate shall open and remain open until returned to normal operation by means of the key switch. Where a gate consists of two leaves, the key switch shall open both simultaneously if operation of a single leaf on the ingress side does not provide for the width, turning radii, or setbacks necessary for fire apparatus to navigate the vehicle entry point. Note this requirement on the plan.
- The key switch shall be labeled with a permanent red sign with not less than ½" contrasting letters reading "FIRE DEPT" or with a "Knox" decal. Note this requirement on the plan.
- New motorized gates shall also be equipped with optical receivers to allow emergency response personnel to remotely open the gate when the emergency vehicle approaches the gate. The receiver shall be located to maximize signal reception from an approaching RVC apparatus. Devices shall be compatible with RVC preemption devices.
- Gate or barrier locks shall be reviewed and approved prior to their installation on any new and/or existing access gate.

5.1.7 Key Boxes

All new structures will comply with RCFD Technical Policy 06-003[8] and Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A as follows:

- Knox devices shall be provided where necessary to ensure that immediate access for firefighting, rescue, and other emergency purposes is possible. Knox equipment locations shall be shown on access plans. At a minimum, Knox devices shall be provided for the following locations:
  - Gates along the paths of firefighter travel from the fire lane to all points along the perimeter of the structure.

8 https://rvcfire.org/pdf/fire-marshal/technical-policies/TP06-003-EmergencyAccessKeyBoxes-01072020.pdf?v=180

  - Exterior doors to buildings, rooms containing main fire alarm panels, annunciators, and/ or fire suppression systems.
  - Doors and gates to other areas identified by RVC-OFM.
- Knox boxes or switches shall be located adjacent to and clearly visible from the gate or door served. They shall be securely mounted to a wall or fence at a height of 6 feet above grade in a location that is easily accessible to firefighters.
- The key used to unlock the gate or door shall be kept in the key box. When the key unlocks more than the individual adjacent gate or door, a label or tag shall be attached to the key identifying the gates or doors it operates. Where multiple gates or doors are served by a single box, two or more copies of the key(s) are recommended so that a copy will be available to each engine/ truck company responding to the site. All keys must have an address tag attached.
- When a Knox cabinet is specified, it shall contain floor plans, chemical inventories, SDS and other materials used to facilitate a response.
- Electromagnetically or electromechanically locked pedestrian gates and doors shall be equipped either with a Knox box containing a key to open the lock or, if the door lock cannot be operated with a key from the exterior, a Knox key switch shall be provided adjacent to the door. Where key switches are provided, the door or gate lock shall remain disengaged until the key switch is returned to the "normal" closed or locked position.

5.1.8 Premises Identification

Identification of roads and structures will comply with Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A and Title 14 Minimum Fire Safe Regulations, which include:

- Approved numbers or addresses shall be placed on the front elevation of all new or existing buildings in such a position that is plainly visible and legible from the street or road on which the property is addressed. Addresses shall not be located where they have the potential of being obstructed by signs, awnings, vegetation, or other building/site elements. An address monument at the vehicle entrance or other location clearly visible and legible from the public road may be provided in lieu of an address on the structure where only a single building with a single street address is present and no other structures are accessible from the fire apparatus access road serving that structure (CBC 501.2, CFC 505.1).
- The numbers/ letters shall contrast with their background. Address numbers must be a minimum of 24 inches when the building exceeds 25 feet, and the numbers shall have a minimum 1/2-inch stroke. When a building contains multiple addresses, an address range may be posted on the structure.
- Buildings that are set back from the primary roads more than 150 feet or otherwise not visible from the public road, shall have a monument provided as approved by RVC-OFM.
- Numbers for new buildings shall be internally or externally illuminated, to be visible at night. This requirement also applies to monuments.
- Where it is unclear as to which street a building is addressed to (e.g., a building is accessed only from a street other than the one it is addressed to; multiple main entrances to the site or building itself front different streets), the name of the street shall also be identified as part of the posted address.
- Approved numbers or addresses shall be placed on the front elevation(s) of all buildings that form the cluster. If all building addresses are not clearly visible or legible from the public road serving the structures,

an address monument shall also be provided at the entry point(s) to the site indicating the range of addresses accessible from that entrance.

- In all cases, the address shall be posted at the beginning of construction and shall be maintained thereafter.
- Newly constructed or approved roads must be identified by a name or number through a consistent system that provides for sequenced or patterned numbering and/or non-duplicative naming within each local jurisdiction. Road signs shall be visible and legible from both directions of vehicle travel for a distance of at least one hundred (100) feet. Signs required by this article identifying intersecting roads shall be placed at the intersection of those roads. The size of letters, numbers, and symbols for road signs shall be a minimum four (4) inch letter height, half inch (.5) inch stroke, reflectorized, contrasting with the background color of the sign. Road signs required by this article shall be posted at the beginning of construction and shall be maintained thereafter.

5.1.9 Ongoing Infrastructure Maintenance

Project Owner/Property Management Company shall be responsible for long-term funding and maintenance of fuel modification zones; however, this responsibility may be transferred to the tenant by an appropriate lease agreement.

5.1.10 Pre-Construction Requirements

Prior to bringing lumber or combustible materials onto the Project site, improvements within the active development area shall be in place, including utilities, operable fire hydrants, an approved, temporary roadway surface, and construction phase fuel modification zones established. These features will be approved by the fire department or their designee prior to combustibles being brought on-site.

A preconstruction meeting with the Riverside County Fire Prevention Unit assigned to Beaumont is advised, prior to the start of underground installation.

5.2 Ignition Resistant Construction and Fire Protection Systems

All new structures within the Project site will be constructed to Fire Code standards. Each of the proposed buildings will comply with the enhanced ignition-resistant construction standards of the 2025 CWUIC (Chapter 5). These requirements address roofs, eaves, exterior walls, vents, appendages, windows, and doors and result in hardened structures that have been proven to perform at high levels (resist ignition) during the typically short duration of exposure to burning vegetation from wildfires. Appendix D provides a summary of the requirements for ignition resistant construction.

While these standards will provide a high level of protection to structures in this development, there is no guarantee that compliance with these standards will prevent damage or destruction of structures by fire in all cases.

5.3 Fire Protection Systems

5.3.1 Water Supply

Water service for the Beaumont Heights Business Centre Project site will be provided by Beaumont Cherry Valley Water District. The Project site is within the District's Sphere of Influence and will be annexed into the District's water supply system boundary

The Project will be consistent with County requirements for fire flow and fire hydrant requirements within a VHFHSZ. All water storage and hydrant locations, mains, and water pressures would be designed to fully comply with Riverside County Fire Code Fire Flow Requirements. As detailed in the County Fire Code Section 8.32.050 and California Fire Code Section 903.2, all structures within the development are required to have an NFPA 13 consistent automatic fire sprinkler systems based on the latest adopted Building and Fire Codes for occupancy types. An RCFD official will be notified prior to a water supply test or provided with approved documentation before approval of the water supply system (CFC Section 507.4).

5.3.2 Hydrants

Fire hydrants will be located along fire access roadways and adjacent to each structure, as determined by the RCFD Fire Marshal and current fire code requirements to meet operational needs. Fire hydrants will be consistent with applicable codes and Riverside County Fire Department Water Supply and Fire Hydrant Requirements for Commercial & Residential Development Guideline OFM-01B[9]. More specifically:

- Hydrants shall be located at street intersections for both public and private streets. Hydrants must be located no more than three feet from the edge of a fire apparatus access road and cannot be located in areas where they will be visually or operationally obstructed (behind fences or walls, in bushes, behind parking spaces, etc.). Clearance shall be provided to a distance no less than three feet from the perimeter of the hydrant.
- The hydrant outlets must face the fire apparatus access road. Where all of the outlets cannot face the fire access road (e.g., the hydrant is located in a landscape peninsula or island in a parking lot; the hydrant has three outlets), the 4" outlet(s) shall take precedence.
- Hydrants shall be located at least 40 feet from the building(s) it serves. Where it is impractical to locate hydrants 40 feet from adjacent structures, hydrant spacing shall be reduced by 50% to provide alternative hydrants for use by fire department personnel responding to an emergency.
- The hydrant or fire valve shall be eighteen (18) inches above the finished surface. Its location in relation to the road or driveway and to the building(s) or structure(s) it serves shall comply with California Fire Code, California Code of Regulations title 24, part 9, Chapter 5, and Appendix C.
- The hydrant head shall be a two and half (2 1/2) inch National Hose male thread with cap for pressure and gravity flow systems and four and a half (4 1/2) inch for draft systems.
- Hydrants with a primary function of connection to a Fire Engine for the purpose of pumping an FDC shall be located so that a hose line running between the hydrant, fire engine, and the fire department connection(s) (FDCs) does not exceed 100 feet.

[9] https://rvcfire.org/pdf/fire-marshal/guideline-ofm/FD%20Water%20Supply%20and%20Fire%20Hydrant%202023%20Guideline%20OFM-01B%20FINAL%201-30-2024%202024.pdf?v=5434

- Hydrants and fire department connections shall not be located behind parking stalls or in other locations where they are likely to be blocked by vehicles or other objects.
- Hydrants and fire department connections should not be located where apparatus staged at these appurtenances would then encroach on minimum fire apparatus turning radii unless alternative routes are available.
- If vehicles can approach the hydrant from more than one direction, the hydrant shall be protected by four bollards of concrete-filled pipe four inches in diameter and mounted in concrete in a square around the hydrant. The bollards need to be spaced a minimum of three feet from the perimeter of the hydrant. Two bollards may protect hydrants that can be approached from only one side. Hydrants may not require protection by bollards if they are located such that the potential for collision is minimal or if they are sufficiently protected by a standard concrete curb at least six inches in height.
- Blue reflective pavement markers ("blue dots") shall be used to identify fire hydrant locations. On two-way streets and roads, markers shall be placed six inches from the edge of the painted centerline or from the approximate center of streets without a painted centerline on the side nearest the hydrant.
- Public hydrants shall be painted Chrome Yellow, or any color (other than red) as specified by the local water purveyor or City Ordinance.

5.3.3 Fire Sprinklers

All structures, of any occupancy type, will be protected by an automatic, internal fire sprinkler system. Fire sprinklers systems will be in accordance with RCFD, and National Fire Protection Association (NFPA) Standard 13 (Per CFC Section 903.2). Fire sprinkler plans for each structure will be submitted and reviewed by RCFD for compliance with the applicable fire and life safety regulations, codes, and ordinances as well as compliance with RCFD Technical Policy 14-001[10], included below. Actual system design is subject to final building design and the occupancy types in the structure.

- Automatic fire sprinkler system risers shall not be obstructed in any manner. If a system riser is to be concealed by means of a wall, soffit, column, or other building construction, it shall be provided with eighteen (18) inch clearance to each side and to the front of the system riser. Access shall be provided by means of a door with the minimum dimensions two (2) feet six (6) inches in width by six (6) feet eight (8) inches in height from the exterior of the building directly to the riser as approved by the fire code official.

5.4 Defensible Space and Vegetation Management

5.4.1 Defensible Space

WUI fire protection requires a systems approach, which includes the components of infrastructure and water, structural safeguards (addressed in the FPP), and adequate defensible space setbacks. This section provides defensible space details for the Project.

10 https://rvcfire.org/pdf/fire-marshal/technical-policies/TP14-001-NewSprinklerRiserAccessibility-01072020.pdf?v=6433

5.4.2 Fuel Modification Zone Requirements

A fuel modification zone (FMZ) is a strip of land between a structure and open space acting as a buffer where combustible vegetation has been removed and/or modified and partially or totally replaced with more appropriately spaced, drought-tolerant, fire resistant plants in order to provide a reasonable level of protection to structures from wildland fire. A typical landscape/fuel modification installation requires a 100-foot-wide fuel modification zone from the structure outwards towards undeveloped areas. This 100-foot-wide fuel modification zone is required to provide defensible space which is defined as managed and maintained areas adjacent to structures that enable fire suppression activities through the removal of flammable fuels and maintenance of landscapes that would not readily transmit wildfire. Defensible space enables firefighters to safely position themselves at the development edge and begin tactical protection efforts. For the Project, the first 100 feet around each of the proposed structures is primarily paved parking, with only some landscaped areas within the 100-foot FMZ. The paved areas provide total fuel modification as all fuels will be removed and replaced with noncombustible concrete. The landscaped areas interspersed within the 100-foot strip will comply with FMZ requirements (refer to section 5.4.2.2). In some places, the paved parking lots extend 300 feet from the buildings, far exceeding the 100-foot requirement (further tract specific detail below).

As wildfire approaches the paved and landscaped areas of the FMZ, fire behavior is affected substantially reducing flame lengths, spread rates and intensity, thus causing wildfires to weaken as they struggle to find available fuels. Fuel modification zones (FMZs) or “brush management” was initially made part of the Public Resources Code 4290 and 4291 to protect natural resources from fires originating in neighboring developed areas and have since become focused on protecting communities and structures. However, FMZs, or fuel maintenance zones, as will be used for the Project, continue to have the same benefit of buffering preserved open space areas from accidental ignitions within developments. Positioning the low plant density, irrigated zone directly adjacent to the structure provides a significant buffer between the structure and other landscape fire and native vegetation. The same way that fuel modification will set back a wildland fire from a structure, the fuel modification will set back a structure fire from the more burnable native plants. Embers can be generated by a structure fire and can be blown over the fuel modification into native fuels, but the inclusion of automatic sprinklers in every building combined with the presence of staffed fire stations with fast response significantly reduces the potential for a structure fire to reach a size that would produce significant impacts. The highest likelihood of vegetation ignitions would be related to the usage of roadways. Further, as depicted in the fire behavior modeling for existing and post-Project conditions, the Project at buildout would reduce the overall risk of wildfire spreading off site with implementation of the fire safety requirements, defensible space, and vegetation management outlined in this FPP.

Cohen (1995) performed structure ignition fire research studies that suggest, as a rule-of-thumb, larger flame lengths and widths require wider fuel modification zones to reduce structure ignition. For example, valid Structure Ignition Assessment Modeling results indicate that a 20-foot-high flame has minimal radiant heat to ignite a structure (bare wood) beyond 33 feet (horizontal distance). Whereas a 70-foot-high flame requires about 130 feet of clearance to prevent structure ignitions from radiant heat (Cohen and Butler 1996). For this fire study example, bare wood was used, which is more combustible than the fire rated concrete tilt-up exterior walls that will be used in the Project.

Based on the conceptual Project site plan, the project has more than adequate on-site defensible space which consists of concrete roadways, parking stalls, and irrigated landscaping.

Industrial Building 1- In the conceptual plan, the first industrial building is located in the northern portion of the project site. It is set back from the property line by between approximately 425 and 745 feet; in between the building and property line there are concrete paved roadways, automobile and trailer parking stalls, and irrigated landscaping. Along the entire eastern and western perimeters of Building 1 are 40-foot wide fire apparatus access roads, in addition to 30-foot wide fire apparatus access roads along the northern and southern perimeters of the industrial building. Beaumont Avenue (SR-79) marks the western boundary of the Project site.

Industrial Building 2- In the conceptual plan, the second industrial building is located south of Building 1. It is set back from the property line between approximately 400 and 810 feet; in between the building and property line there are concrete paved roadways, parking stalls, and irrigated landscaping. Along the entire eastern and western perimeters of Building 2 are 40-foot wide fire apparatus access roads, in addition to 30-foot wide fire apparatus access roads along the northern and southern perimeters. Beaumont Avenue (SR-79) marks the western boundary of the Project site.

Industrial Building 3- In the conceptual plan, the third industrial building is located south of building 2. It is set back from the property line between approximately 510 and 980 feet; in between the building and property line there are concrete paved roadways, parking stalls, and irrigated landscaping. Along the entire eastern and western perimeters of Building 3 are 40-foot wide fire apparatus access roads, in addition to 30-foot wide fire apparatus access roads along the northern and southern perimeters. Beaumont Avenue (SR-79) marks the western boundary of the Project site.

Industrial Building 4- In the conceptual plan, the fourth industrial building is the southernmost building on the Project site. It is set back from the property line between approximately 305 and 1050 feet; in between the building and property line there are concrete paved roadways, automobile and trailer parking stalls, and irrigated landscaping. Along the entire eastern and western perimeters of Building 4 are 40-foot wide fire apparatus access roads, in addition to 30-foot wide fire apparatus access roads along the northern and southern perimeters.

Appendix E, Conceptual Site Fuel Modification Plan shows the locations where the fuel modification area is to be located.

Vegetation management will also be implemented as an interim fuel management area throughout the construction phases for each structure. Since construction is estimated to take seven years, there may be a period where developing phases are exposed on multiple sides to wildland fuels. The FMZs will be implemented according to the following requirements for the entire Project.

5.4.2.1 Fuel Modification Zone 0 – Ember Resistant Zone

The Ember-Resistant Zone is applicable site-wide and is measured from the exterior wall of the structures outward to 5-feet (horizontal). The ember-resistant zone is designed to keep fire or embers from igniting materials that can spread the fire to the structure. This zone shall be constructed of continuous hardscape or non-combustible materials acceptable to the FAHJ. The Project's property owner is responsible for the removal of combustible materials surrounding exterior wall areas and maintaining areas free of combustible materials. The use of mulch and other combustible materials shall be prohibited.

The Ember-Resistant Zone includes the following key components:

- The use of hardscaping like gravel, pavers, concrete, and other non-combustible materials. No combustible bark or mulch.
- Remove all dead and dying weeds, grass, plants, shrubs, trees, branches, and vegetative debris (leaves, needles, cones, bark, etc.).
- Remove and/or maintain all tree branches within 10 feet of the roof or side of the building.
- Limit plants in this area to low growing, nonwoody, properly watered and maintained plants.
- Relocate pallets, firewood, and lumber to be a minimum 30 feet or more from the structure.
- Replace combustible fencing, gates, and other structures within this zone to non-combustible materials.
- Vegetation shall be limited to heights not exceeding 18 inches.
- Vegetation shall be irrigated.
- Relocate garbage and recycling containers outside this zone when possible.
- Relocate vehicles outside this zone when possible.

5.4.2.2 Fuel Modification Zone 1 – Lean, Clean, and Green Zone

The FMZ occurs around the perimeter of the Project's wildland exposure at Project build out (Appendix E). Zone 1 extends 30 feet from buildings and structures or to the property line, whichever is closer. All highly flammable native vegetation, especially found on the Prohibited Plant List (Appendix F) shall be removed except for species approved by the fire marshal. This area will largely be paved with some irrigated landscaping. The Project's plant palette will be approved by the fire department. A permanent, automatic irrigation system will be installed throughout the Project to maintain hydrated plants. Zone 1 includes the following key components:

- All trees shall be planted and maintained at a minimum of 10 feet from the tree's drip line to any combustible structure.
- Tree spacing of a minimum 10 feet between canopies.
- Mature trees shall be limbed to six feet or three times the height of understory plants to prevent ladder fuels, whichever is greater.
- No tree limb encroachment within 10 feet of a structure.
- Tree maintenance includes limbing-up (canopy raising) six feet or one-third the height of the tree.
- Maintenance including ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying plantings, maintenance of the programming and functionality of the irrigation system, regular trimming to prevent ladder fuels.
- Trees and tree form shrub species that naturally grow to heights that exceed two feet shall be vertically pruned to prevent ladder fuels.
- Grasses shall be cut to four inches in height. Native grasses can be cut after going to seed.
- Ground covers within the first three feet from structure restricted to non-flammable materials, including stone, rock, concrete, bare soil, or other.
- Requires regular maintenance such as thinning or removal of plants focusing on removal of dead annual grasses.
- Fuel continuity should be interrupted so that groupings of shrubs are separated from adjacent groupings.

- Maintenance including ongoing removal and thinning of dead/dying planting, and regular trimming to prevent ladder fuels.
- Trees and tree-form shrub species that naturally grow to heights that exceed four feet shall be vertically pruned up 1/3 of their height or six feet above the ground, whichever is less, to prevent ladder fuels.
- No vegetation found on the Prohibited Plant List (Appendix F) shall remain in the fuel maintenance zone.

5.4.2.3 Fuel Modification Zone 2 – Reduce Fuel Zone

Zone 2 extends from 31 feet to 100 feet out from buildings and structures or to the property line, whichever is closer. Zone 2 includes the following key components:

- Trim annual grass to a maximum height of four inches.
- Space out shrubs and trees horizontally.
- Ensure vertical spacing between grass, shrubs, and trees.
- Remove fallen leaves, needles, and small branches, but can leave up to three inches.
- Keep exposed wood piles at least 10 feet clear from surroundings, down to the soil.
- Ensure outbuildings and LPG tanks have 10 feet of clear space to bare soil and no flammable vegetation within an additional 10 feet around them.

5.4.3 Vegetation Management Maintenance

Vegetation management, i.e., assessment of the fuel modification zones' condition and removal of dead and dying and undesirable species; as well as thinning as necessary to maintain specified plant spacing and fuel densities, shall be completed annually by May 1 of each year, and more often as needed for fire safety, as determined by the RCFD. The vegetation management will be funded by the Project and shall be conducted by their contractor(s). The Project shall be responsible for all vegetation management throughout the development, in compliance with the Project FPP that is consistent with requirements.

The permanent fuel maintenance zone required for the Project will be maintained by the applicant during construction and by the owner or a Property Management Company/Association which will be responsible for vegetation management once the Project is built out. The Owner or Property Manager will be responsible for streetscape and vegetation management in perpetuity.

On-going/as-needed fuel modification maintenance during the interim period while the Project is built out will include necessary measures for consistency with the FPP, including:

- Regular maintenance of undisturbed open space on project site in accordance with weed abatement regulations.
- Removal or thinning of undesirable combustible vegetation and replacement of dead or dying landscaping.
- Maintaining ground cover at a height not to exceed 18 inches. Annual grasses and weeds shall be maintained at a height not to exceed three inches.
- Removing accumulated plant litter and dead wood. Debris and trimmings produced by thinning and pruning should be removed from the Project site or chipped and evenly dispersed in the same area to a maximum depth of four inches.

- Maintaining manual and automatic irrigation systems for operational integrity and programming. Effectiveness should be regularly evaluated to avoid over or underwatering.
- Complying with these FPP requirements on a year-round basis. Annual inspections are conducted following the natural drying of grass and fine fuels, between the months of May and June, depending on precipitation during the winter and spring months.

5.4.4 Environmentally Sensitive Areas/Open Space

There should not be a need to modify the fuel maintenance zone as it is planned to meet the fuel management needs of the Project site and comply with the fire code. However, if unforeseen circumstances were to arise that require hazard reduction within an area considered environmentally sensitive or part of the Multispecies Conservation Plan, it may require approval from the County and the appropriate resource agencies (California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers) prior to any vegetation management activities occurring within those areas.

5.4.5 Prohibited Plants

Certain plants are considered prohibited in the landscape due to characteristics that make them highly flammable. These characteristics can be physical (structure promotes ignition or combustion) or chemical (volatile chemicals increase flammability or combustion characteristics). The plants included in the Prohibited Plant List (Appendix F) are unacceptable from a fire safety standpoint and will not be planted on the Project site or allowed to establish opportunistically within fuel modification zones or landscaped areas.

5.4.6 Construction Phase Vegetation Management

Vegetation management requirements shall be implemented at Project commencement and throughout the construction phase for each planning area. Vegetation management will be performed pursuant to the FAHJ on all building locations prior to the start of work and prior to any import of combustible construction materials. Adequate fuel breaks will be created around all grading, site work, and other construction activities in areas where there is flammable vegetation.

6 Wildfire Education Program

The business owners of the Beaumont Heights Business Centre Project will be provided with a proactive educational component disclosing the potential wildfire risk and this report's requirements. This educational information must include maintaining the landscape and structural components according to the appropriate standards and embracing a "Ready, Set, Go!" stance on evacuation. Additionally, management of on-site entities occupying the site's structures will be required to register for emergency alerts via the Alert RivCo messaging system (https://rivcoready.org/alert-rivco). Personnel and employees will be strongly encouraged to also register to receive emergency alerts.

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7 Evacuation Analysis

A wildfire evacuation study is being prepared by Dudek. Please refer to that separate technical report for details regarding evacuation planning, timing available and time needed to evacuate the site, and discussion of other available contingency options that may be employed by emergency managers.

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8 Conclusion

This FPP for the Beaumont Heights Business Centre Project provides guidance for vegetation maintenance for the proposed fuel maintenance zones and landscaped areas on the Project site. As described, vegetation maintenance measures will be provided on all sides of the proposed development. The requirements and recommendations provided in this FPP have been designed specifically for the Project. This analysis and its fire protection justifications are supported by fire science research, results from previous wildfire incidents, and fire agencies that have approved these concepts. The Project design features, including concrete paved roads and parking stalls, and a fully irrigated landscape, provide over a 100-foot wide FMZ. The Project is considered to represent a low wildfire risk to its occupants based on its fire protection design features and its ability to provide for evacuations and contingency on-site shelter in place.

Ultimately, it is the intent of this FPP to guide the fire protection efforts for the Project in a comprehensive manner. Implementation of the measures detailed in this FPP will reduce the risk of wildfire spreading from the Project site into surrounding areas and will improve the ability of firefighters to fight fires on the Project site and neighboring properties and resources, irrespective of the cause or location of ignition.

It must be noted that during extreme fire conditions, there are no guarantees that a given structure will not be exposed to wildfire or embers. Precautions and minimizing actions identified in this report are designed to reduce the likelihood that fire will impinge upon the Project's assets or threaten its visitors. Additionally, there are no guarantees that fire will not occur in the area or that fire will not damage property or cause harm to persons or their property. Implementation of the required enhanced construction features provided by the applicable codes and the fuel modification requirements provided in this FPP will reduce the Project site's vulnerability to wildfire and help to limit the spread of fire from the Project site to surrounding areas. It will also help accomplish the goal of this FPP to assist firefighters in their efforts to defend structures.

It is recommended that the Beaumont Heights Business Centre maintains a conservative approach to fire safety. This approach must include maintaining the landscape and structural design components according to the appropriate standards and embracing a "Ready, Set, Go!" stance on evacuation. The Project is not to be considered a shelter-in-place development. However, fire agencies and/or law enforcement officials may, during an emergency, as they would for any new development providing the layers of fire protection as the Project, determine that it is safer to temporarily refuge employees or visitors on the Project site. When an evacuation is ordered, it will occur according to pre-established evacuation decision points or as soon as notice to evacuate is received, which may vary depending on many environmental and other factors. Fire is a dynamic and somewhat unpredictable occurrence, and it is important for anyone working in the WUI to educate themselves on practices that will improve safety.

Any person or entity furnished with this report and/or who reviews it agrees that the advance written consent of Dudek be sought and furnished to such person or entity prior to the review, reliance or authorization as to any matters that are the subject of the reports by any person or entity (whether through act or omission as set forth in the report), other than Dudek's direct client. In such case, obtaining Dudek's consent shall not be subject to any fee or charge (other than reasonable copy costs, where applicable).

Dudek expressly disavows, does not assume any responsibility for, nor will be liable for any claims, losses, or damages associated with any matters that are the subject of this or other reports it prepares or contributes to

respecting this project, however characterized (including without limitation as sounding in tort, breach of contract, misrepresentation by act or omission, failure to adhere to applicable standards of professionalism, statutory liability, etc.), whether in law or equity, whether known or unknown, and whether actual or contingent, excepting only Dudek's direct client, as to which the limitation of liability provisions in the contract between Dudek and its client shall govern.

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Appendix A

Representative Project Site Photographs

Appendix B

Beaumont Heights Business Centre
Project Vicinity Fire History Map

Appendix C

BehavePlus Fire Behavior Analysis

Appendix D

Ignition-Resistant Construction Requirements

Appendix E
Project Fuel Modification Plan

Appendix F
Prohibited Plant List

- Application of the latest adopted ignition-resistant building codes.
  - Non-flammable roofs, which would be Class "A" listed and fire-rated roof assembly, installed per manufacturer's instructions, to approval of the City. Roofs would be made tight with no gaps or openings on ends or in valleys, or elsewhere between roof covering and decking, in order to prevent intrusion of flames and embers. Any openings on ends of roof tiles would be enclosed to prevent intrusion of burning debris. When provided, roof valley flashings would not be less than 0.019 inch (No. 26 gage galvanized sheet) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of 72 pound ASTM 3909 cap sheet running the full length of the valley.
- Exterior wall coverings are to be non-combustible form in place concrete.
- Multipane glazing with a minimum of one tempered pane.
- Ember-resistant vents (recommend BrandGuard, O'Hagin, or similar vents).
- Interior, automatic fire sprinklers to code for occupancy type.
- No eaves or soffits.
- There would be no use of paper-faced insulation or combustible installation in attics or other ventilated areas.
- There would be no use of plastic, vinyl (with the exception of vinyl windows with metal reinforcement and welded corners), or light wood on the exterior.
  - Any vinyl frames to have welded corners and metal reinforcement in the interlock area to maintain integrity of the frame certified to ANSI/AAMA/NWWDA 101/I.S 2 97 requirements.
- Skylights to be tempered glass.
- Rain gutters and downspouts to be non-combustible. They would be designed to prevent the accumulation of leaf litter or debris, which can ignite roof edges.
- Doors to be of approved noncombustible construction or would be solid core wood having stiles and rails not less than 1 3/8 inches thick or have a 20-minute fire rating. Doors to comply with City Building Code.
- There would be no combustible awnings, canopies, or similar combustible overhangs.
- No combustible fences to be allowed within 5 feet of structures.
- All chimneys and other vents on heating appliances using solid or liquid fuel, including outdoor fireplaces and permanent barbeques and grills, to have spark arrestors that comply with the City Fire Code. The code requires that openings would not exceed 1/4-inch. Arrestors would be visible from the ground.
- Modern infrastructure, access roads, and water delivery system.
- Maintained FMZs.

Notably, interior fire sprinklers, which would be provided in all structures (required by code since 2010), have an extremely high reliability track record (NFPA 2021) of controlling fire in 96% of reported fires, and statistics indicate that fires in structures with sprinklers resulted in 82% lower property damage and 68% lower loss of life (Hall 2013). NFPA 13 fire sprinklers are designed for structure protection and life safety. For wildland fire defense, should embers succeed in entering a structure, sprinklers provide an additional layer of life safety and structure protection.

Sheltering In Place as an Active Emergency Option at Beaumont Heights Business Centre

Sheltering in place or providing temporary refuge when evacuation is considered undesirable is not a new idea. Sheltering in place has been a useful tool in the emergency management toolbox since the 1950's. In some wildfire scenarios, temporarily sheltering in a protected structure is safer than evacuating. Huntzinger (2010) states that:

"If sheltering in place can provide the community with the same level of protection from an emergency incident as mass evacuation, this will be the recommended practice to use." Many civilian deaths have occurred when the population evacuated late and was exposed to wildfire on unprotected roadways (Braun, 2002, CFA 2004). By contrast, fire hardened communities/projects that have implemented similar fire protection, setback, and building standards have fared well in fire events, making them suitable for temporary shelter. Developments constructed in accordance with modern fire-safe development standards also survived the 2003 Simi Fire, the 2008 Freeway Complex Fire, and the 2020 Silverado Fire without a single building lost. Nasiatka (2003) points out that another advantage to sheltering in place in an appropriately protected location is that there would be a substantial reduction in the number of evacuees that would need to be managed, allowing those evacuees at greater risk (i.e., in older, less protected communities) to more quickly evacuate.

2.4.5 Wildfire Risk Awareness Education

The Project includes an education awareness program that is a key piece in wildfire prevention in the area (Steffey et al., 2020). This program will provide wildfire information for the area and create greater risk awareness for occupants and their employees. The wildfire education program will be facilitated by the business owners of the Project and will disclose the potential wildfire risk and the requirements of the FPP. The educational program will also include information regarding the necessary landscape maintenance and structural-based fire protection features. Having ongoing education included in the Project creates a heightened level of wildfire risk awareness and fire protection measures. This benefits both the Project and the surrounding areas as people would be more aware of the wildfire risk and potential impacts. Further, it decreases the likelihood the Project occupants and users would cause an uncontrolled ignition, and they would be aware of what steps to take if they observe an ignition. As such the impact on off-site areas would be further lowered by reducing the probability of ignition.

As described above it is not as simple to say development in areas with high fire hazards will equate to increased wildfire risk. It is possible to develop in these areas when fire protection is incorporated into Project design and create a site that is not only hardened against fire but designed to prevent fires. The dual benefit of creating a development that can prevent fire is that it offers protection to the surrounding communities and the environment. The requirements and recommendations outlined in the FPP have been designed specifically for the proposed construction in the Project's location and can significantly reduce the potential threat to off-site areas.

3 Anticipated Fire Behavior

3.1 Fire Behavior Modeling

Following field data collection efforts and available data analysis, fire behavior modeling was conducted to document the type and intensity of fire that would be expected adjacent to the Project site given characteristic features such as topography, vegetation, and weather. Dudek utilized BehavePlus software package version 6 (Andrews, Bevins, and Seli 2008) to analyze potential fire behavior for the northern, eastern, and western edges of the Project site, with assumptions made for the pre- and post-Project slope and fuel conditions. Results are provided below and a more detailed presentation of the BehavePlus analysis, including fuel moisture and weather input variables, is provided in Appendix C, Fire Behavior Modeling Summary. BehavePlus modeling is described below followed by the fire spread modeling details.

3.2 Fire Behavior Modeling Analysis

An analysis was conducted to evaluate both pre- and post- Project vegetation fire behavior variables and to objectively predict flame lengths, intensities, and spread rates for four pre- proposed Project scenarios were evaluated, including two average summer weather conditions (southwest of the proposed Project site and west of the Project site) and two extreme weather offshore wind condition (north and east of the proposed Project site). Additionally, all of the scenarios were run for post-project conditions. These fire scenarios incorporated observed fuel types representing the dominant vegetation representative within and adjacent to the development site, in addition to slope gradients, wind, and fuel moisture values for both the 50th percentile weather (summer, on-shore and off-shore winds) and the 97th percentile weather (fall, off-shore winds). Modeling scenario locations were selected to better understand different fire behavior that may be experienced on or adjacent to the site.

To support the fire behavior modeling efforts conducted, a Dudek Fire Protection Planner analyzed the different vegetation types observed on and adjacent to the site and were classified into the aforementioned numeric fuel models. As is customary for this type of analysis, the terrain, and fuels directly adjacent to the site and proposed fuel modification zones (FMZ) are used for determining flame lengths and fire spread. Vegetation types, which were derived from the field assessment, were classified into fuel models. Fuel models are selected by their vegetation type, fuel stratum most likely to carry the fire, and depth and compactness of the fuels. Fire behavior modeling was conducted for vegetative types that are both on and adjacent to the proposed development. Fuel models were also assigned to illustrate post-Project fire behavior changes. Fuel models were selected from Standard Fire Behavior Fuel Models: a Comprehensive Set for Use with Rothermel's Surface Fire Spread Model (Scott and Burgan 2005). Fuel models were also assigned to the fuel FMZs to illustrate post-Project fire behavior changes. Based on the anticipated existing and post-Project vegetation conditions, five different fuel models were used in the fire behavior modeling effort presented herein. Fuel model attributes are summarized in Table 1.

Table 1. Fuel Model Characteristics

Fuel Model Assignment	Vegetation Description	Location	Fuel Bed Depth (Feet) [1]
Existing Fuel Model Characteristics			
GR1	Short, sparse dry climate grass	Represents the annual grasslands on and off the proposed Project site	0.4
GR2	Low load dry climate grass	Represents the annual grasslands on and off the proposed Project site	1
GS1	Low load dry climate grass-shrub	Represents the annual grass and scrub on and off the proposed Project site	0.9 ft
GS2	Moderate load dry climate grass-shrub	Represents the annual grass and scrub on and off the proposed Project site	1-3 ft
SH2	Moderate load dry climate shrub	Represents the California sage scrub on and off the Project site	1 ft
SH5	High Load, Dry Climate Shrub	Represents the dense chapparal on and off the Project site	4 ft – 5 ft
Post-Development Fuel Model Characteristics			
FM8	Compact Litter	Onsite Zone 1 and 2 fuel modification	0.2 ft.
GR2	Low load dry climate grass	Landscaped area surrounding the developed footprint within Project boundary	1
GS2	Moderate load dry climate grass-shrub	Off site grassland and shrubs adjacent to Project site	1-3 ft
SH2	Moderate load dry climate shrub	Off site California sage scrub fuels adjacent to Project site	1 ft
SH5	High load, dry climate shrub	Off site scrub and chapparal fuels adjacent to Project site	6 ft
NB	Non-burnable	Paved areas throughout the proposed Project site.	0 ft.

Note:

[1] Listed fuel bed depths are a reflection of the fuel models that best depict the vegetation in and around the Proposed Project site and not an exact measure of local vegetation (Anderson 1982; Scott & Burgan 2005).

A total of four existing conditions fire modeling scenarios were completed for the development area with the same conditions modeled for post Project scenarios as well. These sites were selected based on the possibility of a fire approaching from these directions during an average on-shore weather pattern (existing conditions Scenarios 1 & 2) and a Santa Ana wind-driven fire event (existing conditions Scenarios 3 & 4). Fuel modification includes the establishment of Zones 1 and 2 that progressively reduce fuels from the development boundary to the perimeter of structures, providing a minimum of 35 feet of fuel modification for all structures.

Table 2 summarizes the weather and wind input variables used in the BehavePlus modeling process.

Table 2. Variables Used for Fire Behavior Modeling

Model Variable	Summer Weather (50th Percentile)	Peak Weather (97th Percentile)
Fuel Models	GR1, GR2, GS1, SH2	GR1, GR2, GS1, GS2, SH2, SH5
1 h fuel moisture	4%	1%
10 h fuel moisture	5%	2%
100 h fuel moisture	8%	5%
Live herbaceous moisture	35%	30%
Live woody moisture	70%	60%
20 ft. wind speed	16 mph (sustained winds)	30 mph (sustained winds); wind gusts of 50 mph
Wind Directions from north (degrees)	260	75
Wind adjustment factor	0.4	0.4
Slope	4-8%	8-10%

3.3 Fire Behavior Modeling Results

The results presented in Tables 3 and 4 depict values based on inputs to the BehavePlus software and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis; rather, the models provide a worst-case wildfire behavior condition as part of a conservative approach. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location would be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

The results of fire behavior modeling analysis for pre- and post-Project conditions are presented in Tables 3 and 4, respectively. Identification of modeling run (fire scenarios) locations is presented graphically in Figure 5, BehavePlus Fire Behavior Analysis Map.

Fire Scenario Locations and Descriptions:

Pre-Project Conditions Onsite/Off site Scenarios

- **Scenario 1.** Fire flaming front approaching the proposed Project site from the open space to the south with average onshore summer winds (16 mph) being fueled on and off site by dry climate grass and some shrubs.
- **Scenario 2.** Fire flaming front approaching the proposed Project site from the open space to the east with average onshore summer winds (16 mph) as it burns through the same vegetation described in Scenario 1.
- **Scenario 3.** Fire flaming front approaching the proposed Project site from the open space to the north with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) being fueled off site by dry climate grass and some shrubs, and onsite by grasslands and scrub brush.
- **Scenario 4.** Fire flaming front approaching the proposed Project site from the open space to the west with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) as it burns through dry climate grasslands and scrub brush off and on-site.

Post Project Conditions Onsite/Off site Scenarios

- **Scenario 1.** Fire flaming front approaching the proposed Project site from the open space to the south with average onshore summer winds (16 mph) being fueled off site by low load dry climate grass and burning through irrigated managed vegetation onsite.
- **Scenario 2.** Fire flaming front approaching the proposed Project site from the open space to the east with average onshore summer winds (16 mph) as it burns through the same vegetation described in Scenario 1.
- **Scenario 3.** Fire flaming front approaching the proposed Project site from the open space to the north with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) being fueled off site by low load dry climate grass and burning through irrigated managed vegetation onsite.
- **Scenario 4.** Fire flaming front approaching the proposed Project site from the open space to the west with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) as it burns through moderate load dry climate scrub brush off site and burning through irrigated and managed vegetation on-site.

The results presented in Tables 3 and 4 depict values based on inputs to the BehavePlus software reflecting a "moment in time" and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis, but the models provide a worst-case wildfire behavior condition as part of a conservative approach. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location would be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

3.4 Fire Behavior Summary

3.4.1 Existing Conditions

The fire behavior models have been run considering pre-Project and post-Project conditions. The proposed Project site maintains similar slope and vegetation types on and off site. The fire behavior models have been run considering pre-Project and post-Project conditions. Under the summer weather conditions modeled in pre-Project Scenario 1, a fire burning uphill through the grasslands and chaparral vegetation would move at a high rate of speed (1.0 mph during sustained winds), produce moderate flame lengths (6.8 feet during sustained winds), and produce embers that could travel 0.3 miles during sustained winds. While the proposed Project would be within range of the embers being produced during this scenario, the Beaumont Heights development would include structures with ignition resistant construction methods and materials as well as an ember-resistant Zone 0 around all structures. The fire modeled in this area within Scenario 1 would produce similar results to a fire burning to the northwest of the Project site, with the same average summer weather conditions, in Scenario 2. Such a fire would burn through the grasslands and chaparral vegetation at a moderate rate of speed (1.0 mph during sustained winds), produce moderate flame lengths (6.8 feet during sustained winds), and produce embers that would travel 0.3 miles.

Under the extreme Santa Ana weather conditions modeled in pre-Project Scenario 3, a fire burning uphill through the grasslands and chaparral vegetation would move at a very high rate of speed (2.0 mph during sustained winds, 4.2 mph during gusts), produce very high flame lengths (14.6 feet during sustained winds, 20.5 mph during gusts), and produce embers that could travel 0.8 miles during sustained winds. While the proposed Project would be within range of the embers being produced during this scenario, the Beaumont Heights development would include

structures with ignition resistant construction methods and materials as well as an ember-resistant Zone 0 around all structures. The fire modeled in this area within Scenario 3 can be compared to a fire occurring to the east of the Project, under the same extreme Santa Ana weather conditions modeled in Scenario 4. Such a fire would burn through the grasslands and chaparral vegetation at a very high rate of speed (3.7 mph during sustained winds, 6.8 mph during gusts), produce very high flame lengths (34.0 feet during sustained winds, 44.8 feet during gusts), and produce embers that would travel 1.4 miles.

Table 3. RAWS BehavePlus Fire Behavior Model Results – Existing Conditions

Fire Scenarios	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/ second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Scenario 1 (Pre-Project): 16% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind south of the site				
Short, sparse grass (GR1)	2.2	33	0.3	0.1
Low load grass (GR2)	6.8	361	1.0	0.3
Low load grass-shrub (GS1)	5.0	188	0.4	0.2
Moderate load shrub (SH2)	6.5	332	0.2	0.3
Scenario 2 (Pre-Project): 3% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind west of the site				
Short, sparse grass (GR1)	2.2	33	0.3	0.1
Low load grass (GR2)	6.8	362	1.0	0.3
Low load grass-shrub (GS1)	5.0	189	0.4	0.2
Moderate load shrub (SH2)	6.5	333	0.2	0.3
Scenario 3 (Pre-Project): 10% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts north of the site (2)				
Short, sparse grass (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Low load grass (GR2)	14.7 (18.0)	1,961 (3,037)	4.0 (6.2)	0.8 (1.3)
Low load grass-shrub (GS2)	14.6 (20.5)	1,934 (4,042)	2.0 (4.2)	0.8 (1.4)
Scenario 4 (Pre-Project): 18% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts east of the site (2)				
Low load grass (GR2)	14.7 (18.0)	1,966 (3,037)	4.0 (6.2)	0.8 (1.3)
Low load grass-shrub (GS1)	10.1 (14.0)	869 (1,763)	1.5 (3.0)	0.6 (1.1)
Moderate load shrub (SH2)	11.6 (16.0)	1,167 (2,338)	0.5 (1.0)	0.7 (1.2)
High load shrub (SH5)	34.0 (44.8)	12,111 (22,049)	3.7 (6.8)	1.4 (2.4)

Notes:
1 Wind-driven surface fire.
2 Values in parentheses represent the respective output in the presence of 50 mph gusts.

3.4.2 Post-Project Condition

As previously mentioned, Dudek conducted modeling of the site for post-fuel modification zones. RCFD requires the establishment of a minimum 100-foot-wide fuel modification zones that includes irrigated zones and thinning zones; however, the project proposes project-specific on-site fuel modification zones (Zones 1 and 2) beginning at the structures and extending outward towards the property line. For modeling the post-FMZ treatment condition,

the fuel model assignment for non-native grass-shrub lands was re-classified according to the specific fuels management (e.g., irrigated, fire resistive landscaping) treatment.

Based on the BehavePlus analysis, after completion of the proposed Project, fire behavior on site would be reduced. There would no longer be the large, dispersed shrubs that could produce large flame lengths. Fire behavior through the on-site irrigated landscapes would be low with very low rates of spread during both average and extreme weather conditions. Fire behavior in fuel modification zones 1 and 2 would be similar to the mowed areas in the existing condition scenarios, and the off site Project adjacent fuels would remain similar to the moderate-shrub areas in the existing condition scenarios. Post-Project conditions in these areas would result in a reduction of up to 31 feet in flame lengths and up to 3.5 mph in spread rates. As a result of the proposed fuel modification, the fire hazard presented by the site would be reduced compared to its current state. This means reduced fire risk for project occupants. Further, the anticipated surface fire would not be anticipated to transition to any proposed structures due to their planned ignition resistance and the proposed integration of the ember-resistant Zone 0.

If any of the fires modeled in pre-Project Scenarios 1 or 2 were to spread onto the proposed Project site following development of the Project, the resulting fire would be described by post-proposed Project Scenarios 1 and 2. Post-proposed Project Scenario 1 describes a fire igniting to the southwest of the Project burning onsite during Project conditions and the adjacent off site fuels during average summer weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In onsite fuel modification zone areas that have been irrigated, mowed and maintained, there would be low flame lengths (1.5 feet during sustained winds), a low rate of spread (0.0 mph during sustained winds) and embers could travel 0.1 miles during sustained winds. Off site areas adjacent to the Project site that have not been maintained would continue to produce high flame lengths (6.5 feet during sustained winds) and move at a moderate rate of speed (0.2 mph during sustained winds) and produce embers that could travel 0.3 miles under sustained winds.

Post-proposed Project Scenario 2 describes a fire igniting to the west of the Project site burning onsite during Project conditions and the adjacent off site fuels during average summer weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In fuel modification zones and areas that have been irrigated, mowed and maintained, the fire behavior would remain the same as in Scenario 1. Off site areas adjacent to the Project site that have not been maintained would continue to produce moderate flame lengths (6.5 feet during sustained winds) and move at a low rate of speed (0.2 mph during sustained winds) and produce embers that could travel 0.3 miles under sustained winds.

If any of the fires modeled in pre-Project Scenarios 3 or 4 were to spread onto the proposed Project site following development of the Project, the resulting fire would be described by post-proposed Project Scenarios 3 and 4. Post-proposed Project Scenario 3 describes a fire igniting to the north of the Project burning onsite during Project conditions and the adjacent off site fuels during extreme Santa Ana weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In onsite fuel modification zone areas that have been irrigated, mowed and maintained, there would be low flame lengths (2.8 feet during sustained winds, 3.0 feet during gusts), a low rate of spread (0.1 mph during sustained winds, 0.2 mph during gusts) and embers could travel 0.3 miles during sustained winds. Off site areas adjacent to the Project site that have not been maintained would continue to produce moderate flame lengths (14.6 feet during sustained winds, 20.5 feet during gusts) and move at a moderate rate of speed (2.0 mph during sustained winds 4.2 mph during gusts) and produce embers that could travel 0.8 miles under sustained winds.

Post-proposed Project Scenario 4 describes a fire igniting to the east of the Project site burning onsite during Project conditions and the adjacent off site fuels during extreme Santa Ana weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In fuel modification zones and areas that have been irrigated, mowed and maintained, there would be low flame lengths (2.8 feet during sustained winds, 3.0 feet during gusts), a low rate of spread (0.1 mph during sustained winds, 0.2 mph during gusts) and embers could travel 0.1 miles during sustained winds. Off site areas adjacent to the Project site that have not been maintained would continue to produce high flame lengths (34.0 feet during sustained winds, 44.8 feet during gusts) and move at a moderate rate of speed (3.7 mph during sustained winds, 6.8 mph during gusts) and produce embers that could travel 0.4 miles under sustained winds.

Table 4. RAWS BehavePlus Fire Behavior Model Results – Post Proposed Project Conditions

Fire Scenarios	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/ second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Scenario 1 (post-Project): 16% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind south of the site				
Irrigated Area (FM8)	1.5	13	0.0	0.1
Landscaped Area (GR1)	2.2	33	0.3	0.1
Off site Project Adjacent Fuel (SH2)	6.5	332	0.2	0.3
Non-burnable	N/A	N/A	N/A	N/A
Scenario 2 (post-Project): 3% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind west of the site				
Irrigated Landscapes (FM8)	1.5	13	0.0	0.1
Landscaped Area (GR1)	2.2	33	0.3	0.1
Off site Project Adjacent Fuel (SH2)	6.5	333	0.2	0.3
Non-burnable	N/A	N/A	N/A	N/A
Scenario 3 (post-Project): 10% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts north of the site (2)				
Irrigated Landscapes (FM8)	2.8 (3.0)	55 (63)	0.1 (0.2)	0.3 (0.4)
Landscaped Area (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Off site Project Adjacent Fuel (GS2)	14.6 (20.5)	1,934 (4,042)	2.0 (4.2)	0.8 (1.4)
Non-burnable	N/A	N/A	N/A	N/A
Scenario 4 (post-Project): 18% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts east of the site (2)				
Irrigated Landscapes (FM8)	2.8 (3.0)	55 (63)	0.1 (0.2)	0.1
Landscaped Area (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Off site Project Adjacent Fuel (SH5)	34.0 (44.8)	12,111 (22,049)	3.7 (6.8)	0.4
Non-burnable	N/A	N/A	N/A	N/A

Note:
1 Wind-driven surface fire.
2 Values in parentheses represent the respective output in the presence of 50 mph gusts.

The following describes the fire behavior variables (Heisch and Andrews 2010) as presented in Tables 3 and 4:

Surface Fire:

Flame Length (feet): The flame length of a spreading surface fire within the flaming front is measured from midway in the active flaming combustion zone to the average tip of the flames.

Fireline Intensity (Btu/ft/s): Fireline intensity is the heat energy release per unit time from a one-foot-wide section of the fuel bed extending from the front to the rear of the flaming zone. Fireline intensity is a function of rate of spread and heat per unit area and is related to flame length. Fireline intensity and the flame length are related to the heat felt by a person standing next to the flames.

Surface Rate of Spread (mph): Surface rate of spread is the "speed" the fire travels through the surface fuels. Surface fuels include the litter, grass, brush, and other dead and live vegetation within about 6 feet of the ground.

The information in Table 5 presents an interpretation of the outputs for five fire behavior variables as related to fire suppression efforts. The results of fire behavior modeling efforts are presented in Tables 3 and 4. Identification of modeling run locations is presented graphically in Figure 5 of this FPP.

Table 5. Fire Suppression Interpretation

Flame Length (ft)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 to 8 feet	100-500 BTU/ft/s	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 to 11 feet	500-1000 BTU/ft/s	Fires may present serious control problems -- torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

3.5 Project Area Fire Risk Assessment

Wildland fires are a common natural hazard in most of southern California with a long and extensive history. Southern California landscapes include a diverse range of plant communities, including vast tracts of grasslands and shrublands, like those found adjacent to the Project site. Wildfire in this Mediterranean-type ecosystem ultimately affects the structure and functions of vegetation communities (Keeley 1984) and will continue to have a substantial and recurring role (Keeley and Fotheringham 2003). Supporting this are the facts that 1) native landscapes, from forest to grasslands, become highly flammable each fall and 2) the climate of southern California has been characterized by fire climatologists as the worst fire climate in the United States (Keeley 2004) with high winds (Santa Ana) occurring during autumn after a six-month drought period each year. Based on this research, the anticipated growing population of Riverside County WUI areas, and the region's fire history, it can be anticipated that periodic wildfires may start on, burn onto, or spot into the Project site. The most common type of fire anticipated

in the vicinity of the Project area is a wind-driven fire from the north moving through the chaparral and sage scrub vegetation on the adjacent lands.

With the conversion of the landscape to ignition-resistant development, wildfires may still encroach upon and drop embers on the site but would not be expected to burn through the site or produce sustainable spot fires due to the lack of available fuels. Studies indicate that even with older developments that lacked the fire protections provided in the Project, wildfires declined steadily over time (Syphard, et. al., 2007 and 2013) and further, the acreage burned remained relatively constant, even though the number of ignitions temporarily increased. This is due to the conversion of landscapes to ignition resistant, maintained areas, more humans monitoring areas resulting in early fire detection and discouragement of arson, and fast response from the fire suppression resources that are located within these developing areas.

Therefore, it will be critical that the latest fire protection technologies, developed through intensive research and real-world wildfire observations and findings by fire professionals, for both ignition resistant construction and for creating defensible space in the ever-expanding WUI areas, are implemented, and enforced. The Project, once developed, would not facilitate wildfire spread and would reduce projected flame lengths to levels that would be manageable by firefighting resources for protecting the Project site's structures, especially given the ignition resistance of the structures and the planned ongoing maintenance of the entire Project site landscape.

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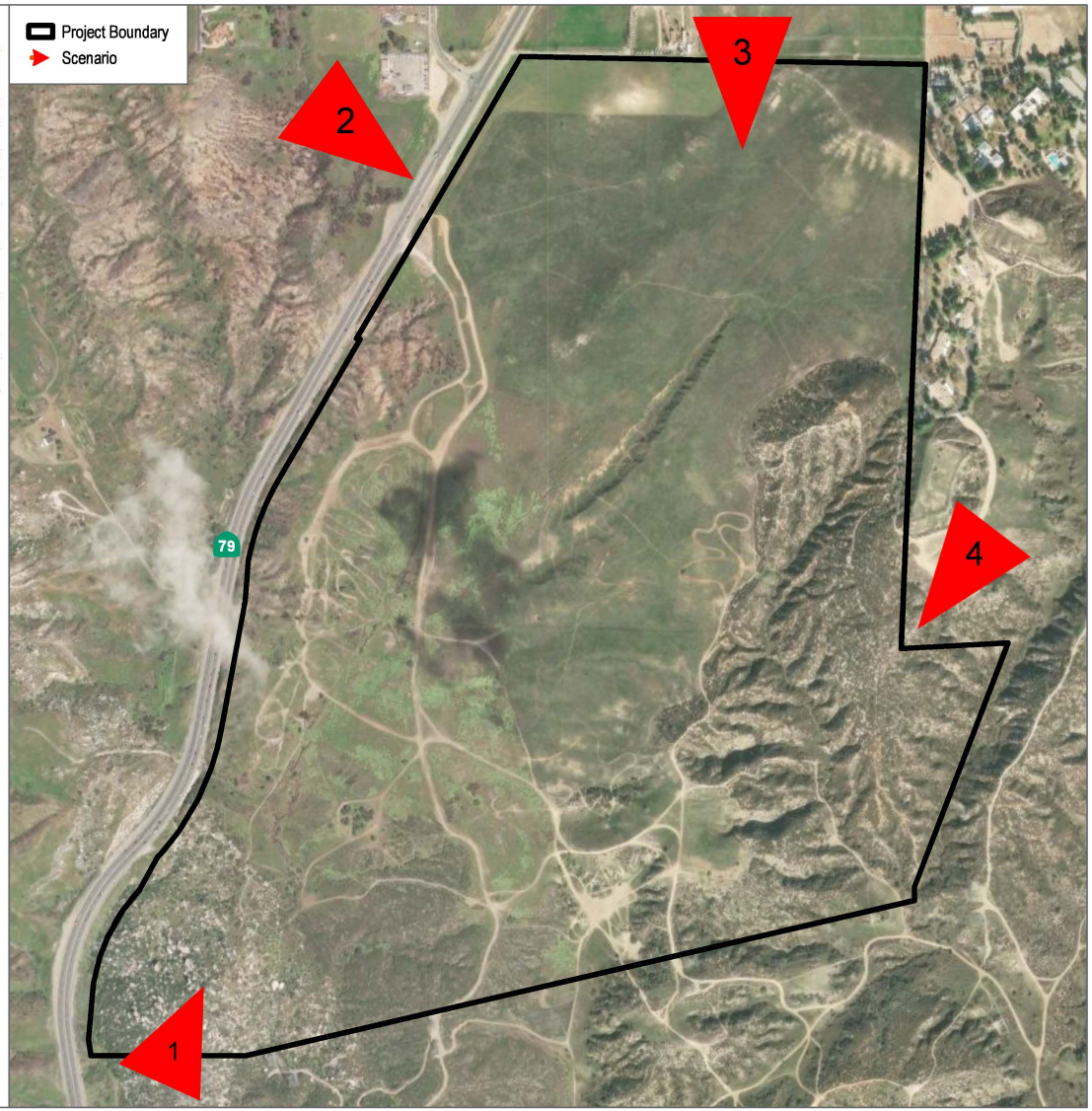
Table 3. Wind and Weather Input Variables

Model Variable	Summer Weather (50th Percentile) On and Offshore Wind	Peak Weather (97th Percentile) Offshore Wind
Fuel Models	GR1, GR2, GS1, SH2	GR1, GR2, GS1, GS2, SH2, SH5
1 h fuel moisture	4%	1%
10 h fuel moisture	5%	2%
100 h fuel moisture	8%	5%
Live herbaceous moisture	35%	30%
Live woody moisture	70%	60%
20 ft. wind speed	16 mph (sustained winds)	30 mph (sustained winds); wind gusts of 50 mph
Wind Directions from north (degrees)	260	75
Wind adjustment factor	0.4	0.4
Slope	4-8%	8-10%

Table 5. RAWS BehavePlus Fire Behavior Model Results – Post Proposed Project Conditions

Fire Scenarios	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Scenario 1 (post-Project): 16% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind south of the site				
Irrigated Area (FM8)	1.5	13	0.0	0.1
Landscaped Area (GR1)	2.2	33	0.3	0.1
Offsite Project Adjacent Fuel (SH2)	6.5	332	0.2	0.3
Non-burnable	N/A	N/A	N/A	N/A
Scenario 2 (post-Project): 3% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind west of the site				
Irrigated Landscapes (FM8)	1.5	13	0.0	0.1
Landscaped Area (GR1)	2.2	33	0.3	0.1
Offsite Project Adjacent Fuel (SH2)	6.5	333	0.2	0.3
Non-burnable	N/A	N/A	N/A	N/A
Scenario 3 (post-Project): 10% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts north of the site [2]				
Irrigated Landscapes (FM8)	2.8 (3.0)	55 (63)	0.1 (0.2)	0.3 (0.4)
Landscaped Area (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Offsite Project Adjacent Fuel (GS2)	14.6 (20.5)	1,934 (4,042)	2.0 (4.2)	0.8 (1.4)
Non-burnable	N/A	N/A	N/A	N/A
Scenario 4 (post-Project): 18% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts east of the site [2]				
Irrigated Landscapes (FM8)	2.8 (3.0)	55 (63)	0.1 (0.2)	0.1
Landscaped Area (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Offsite Project Adjacent Fuel (SH5)	34.0 (44.8)	12,111 (22,049)	3.7 (6.8)	0.4
Non-burnable	N/A	N/A	N/A	N/A

Note:
1 Wind-driven surface fire.
2 Values in parentheses represent the respective output in the presence of 50 mph gusts.



SOURCE: ESRI Aerial Imagery (accessed 2025);

DUDEK

0 310 620 Feet

FIGURE 5
Fire Behavior Analysis
Beaumont Heights Business Centre Fire Protection Plan

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4 Emergency Response and Service

4.1 Emergency Response

The Project site is located within the RCFD response area, which includes Beaumont's corporate limits and the County areas within the City's sphere of influence. The City of Beaumont contracts with RCFD for emergency and administrative services. Table 6, Closest Responding RCFD Fire Stations Summary, presents a summary of the location, equipment, and staffing levels for the three closest, existing RCFD stations responding to the Project.

Table 6. Closest Responding RCFD Fire Stations Summary

Station No.	Location	Equipment*	Staffing*
66	628 Maple Avenue Beaumont, California 92223	(1) Type 1 Engine (1) Squad	5 personnel
20	1550 E. 6th Street Beaumont, California 92223	(1) Type 1 Engine (2) Type 3 Engines	9 personnel**
106	2000 Western Knolls Avenue Beaumont, California 92223	(1) Type 1 Engine	3 personnel

Notes:
* Staffing levels and equipment from Riverside County Fire Department, phone conversation with staff from Station 66, April 15, 2025.
** RCFD Station 20 staffing is 9 during the fire season but is reduced outside of fire season.

RCFD Beaumont Station 66 would currently provide an initial response to the Project site and is located at 628 Maple Avenue. Station 66 has one staffed Type 1 Engine and one staffed Squad. Secondary response would be provided from RCFD Beaumont Station 20, which is located at 1550 E. 6th Street. Beaumont Station 20 has one staffed Type 1 Engine and two staffed Type 3 Engines during the fire season. Station 20's staffing is reduced outside of the fire season. RCFD Beaumont Station 106 (the "West Side Fire Station") is located at 2000 Western Knolls Avenue. Beaumont Station 106 has one staffed Type 1 Engine. This station decreases the response times for the City's west side communities, including Olivewood, Tournament Hills, Tukwet, and the logistics centers located off of SR-60[3].

Within the area's emergency services system, fire and emergency medical services are also provided by other RCFD Fire Stations. Generally, each agency is responsible for structural fire protection and wildland fire protection within their area of responsibility. However, mutual aid agreements enable non-lead fire agencies to respond to fire emergencies outside their district boundaries. In the Project area, fire agencies cooperate under a statewide master mutual aid agreement for wildland fires. There are also mutual aid agreements in place with neighboring fire agencies and typically include interdependencies that exist among the region's fire protection agencies for structural and medical responses but are primarily associated with the peripheral "edges" of each agency's boundary.

In an effort to understand fire department response capabilities, Dudek conducted an analysis of the travel-time response coverage from the closest responding fire stations. The response time analysis was conducted using travel distances that were derived from Google road data. Travel times were calculated by applying the distance at speed

[3] INITIAL STUDY/MITIGATED NEGATIVE DECLARATION FOR THE WEST SIDE FIRE STATION PROJECT BEAUMONT, CALIFORNIA January 2022

limit formula (T=(D/S) * 60, where T=time, D=distance in miles, and S=speed in MPH) as well as the nationally recognized Insurance Services Office (ISO) Public Protection Classification Program's Response Time Standard formula (T=0.65 + 1.7 D, where T= time and D = distance) for comparison. The ISO response travel time formula discounts speed for intersections, vehicle deceleration and acceleration, and does not include turnout time. Tables 7 and 8 present tabular results of the emergency response time analysis using the distance at speed formula and the ISO formula, respectively.

Table 7. Project Emergency Response Analysis using Speed Limit Formula

RCFD Station No.	Travel Distance to Project Site	Travel Time to Project Site*	Total Response Time**
66	1.6 miles	2 minutes 44 seconds	4 minutes 44 seconds
20	2.9 miles	4 minutes 58 seconds	6 minutes 58 seconds
106	3.8 miles	6 minutes 31 seconds	8 minutes 31 seconds

Notes:

* Assumes travel distance and time to the Project site entrance for the respective fire station. Also assumes application of the distance at speed limit formula (T=(D/S) * 60, where T=time, D=distance in miles, and S=speed in MPH), a 35-mph travel speed, and does not include turnout time.

** Assumes travel distance and time to the Project site entrance for the respective fire station, and application of the distance at speed limit formula (T=(D/S) * 60, where T=time, D=distance in miles, and S=speed in MPH), a 35 mph travel speed along with dispatch and turnout time, which can add an additional two minutes to travel time.

Table 8. Project Emergency Response Analysis using ISO Formula

RCFD Station No.	Travel Distance to Project Site	Travel Time to Project Site*	Total Response Time**
66	1.6 miles	3 minutes 22 seconds	5 minutes 22 seconds
20	2.9 miles	5 minutes 35 seconds	7 minutes 35 seconds
106	3.8 miles	7 minutes 7 seconds	9 minutes 7 seconds

Notes:

* Assumes travel distance and time to the Project site into the development for the respective fire station. Also assumes application of the ISO formula, T=0.65+1.7(Distance), a 35-mph travel speed, and does not include turnout time.

** Assumes travel distance and time to the Project site into the development for the respective fire station. Also assumes application of the ISO formula, T=0.65+1.7(Distance), a 35-mph travel speed, and dispatch and turnout time, which can add an additional two minutes to travel time.

Emergency response time target thresholds include travel time along with dispatch and turnout time, which can add two minutes to travel time. The closest fire station, Station 66, could provide an initial response to the Project site within 4 minutes and 44 seconds (Speed Limit Formula) or 5 minutes and 22 seconds (ISO Formula) after departing the station. Station 20 could respond to the Project site within 6 minutes and 58 seconds (Speed Limit Formula) or 7 minutes and 35 seconds (ISO Formula) after departing the station. Station 106 could respond to the Project site within 8 minutes and 31 seconds (Speed Limit Formula) or 9 minutes and 7 seconds (ISO Formula) after departing the station. All response calculations are based on an average response speed of 35 mph and are consistent with NFPA 1710.

On March 7, 2017, the Riverside County Board of Supervisors (Board) received and filed RCFD's "Alternative Staffing Model Recommendation." The Alternative Staffing Model Recommendation was fiscally driven and developed by RCFD due to funding difficulties to retain 3-person engine companies. The RCFD FY 17-18 Service Alternatives report, dated March 7, 2017, recommends the following response times based on four Board Approved Land Use Classifications as described in Table 9:

Table 9. Land Use Classification Information with Staffing/Time Response Standards

Land Classification	Population Density	Fire Staffing Characteristics	Response Time
HEAVY URBAN	>700 per square mile	Land use includes large commercial and industrial complexes, large business parks, high-rise and wide rise community centers and high-density residential dwelling units of 10 to 20 units per acre.	5:00 minutes, 90% of the time
URBAN	>500 per square mile	Land use includes large commercial and industrial complexes, large business parks, high-rise and wide rise community centers and high-density residential dwelling units of 8 to 20 units per acre.	6:30 minutes, 90% of the time
RURAL	100 to 500 per square mile	Light industrial zones, small community centers and residential dwelling unit density of 2 to 8 units per acre.	10:30 minutes, 90% of the time
OUTLYING	<100 per square mile	Areas of rural mountain and desert, agricultural uses, small scale commercial, industrial and manufacturing, service commercial, medium industrial and low density residential dwelling units; 1 dwelling unit per acre to 1 dwelling unit per 5 acres.	17:30 minutes, 90% of the time

Source: Riverside County Fire Department FY 17-18 Service Alternatives. March 7, 2017.

Based on the Project area's inclusion of large commercial and industrial complexes, it is assumed that the Project is be classified as "Heavy Urban," with a 5.0-minute first-in fire engine response time. As previously mentioned, response to the Project site from the second closest existing Fire Station (Station 20) would achieve a 5-minute travel time to the entrance of the Project and the closest fire station, Station 66, would achieve a travel time to the Project entrance in 2 minutes and 44 seconds. Total response time would include the addition of dispatch and turnout time, which is often considered approximately 2 minutes, resulting in a total response time of 4 minutes and 44 seconds for Station 66 to the Project's entrance. By meeting the 5-minute response time, the Project will not adversely impact the overall goal achievement due to the low number of calls (discussed below) that are projected.

According to the RCFD 2016 TriData Report, units should travel to calls within the defined response time goal for the appropriate population density classification 80% of the time. As noted in the report, Station 66 was in compliance of meeting the defined response time 81.4% of the time and Station 20 was in compliance 83.9% of the time. Additionally, areas that have fewer units available or are farther from neighboring stations are more impacted than others by an increase in emergency calls. They have greater workload sensitivity–as the workload

increases, their ability to meet the demand decreases. Station 66 is considered to have a low sensitivity workload, and Station 20 is considered to have moderate sensitivity, both with the capacity for more workload[4].

4.2 Estimated Calls and Demand for Service from the Project

The following estimated annual emergency call volume generated by the Project (Industrial buildings) is based upon per capita data for 2022 from RCFD calls within their jurisdiction[5].

- Total population served: 53,036 (as of 2020 Beaumont Population, US Census Bureau)
- Total annual calls: 5,023. Per capita call generation: 0.095
- Total annual fire calls, including Structure Fire, Wildland Fire, and Other Fire calls (2.07% of total calls): 104. Per capita call generation: 0.002
- Total annual Emergency Medical Services (74.80% of total calls): 3,757. Per capita call generation: 0.071
- Total other calls, including False Alarm, Traffic Collisions, Hazardous Materials, Other Miscellaneous (23.13% of total calls): 1,162. Per capita call generation: 0.022

Using the data above, the estimated annual emergency call volume for the Project site was calculated (Table 9). In order to provide this conceptual estimate, Dudek made assumptions regarding industrial populations within the Beaumont Heights Business Centre Project. The Project's VMT analysis (Urban Crossroads, Inc 2025) estimates the total number of employees to be up to approximately 6,114 with the buildings operating up to 24 hours a day, 7 days a week. The number on-site at any given time may vary by time of day, due to employee shift work, estimated transient population and operating hours of individual businesses. Based on this information, the total maximum estimated population (which includes employees and transient use) of the Project site at any given time, is projected to be 6,114 persons, however with three shifts per day the estimate would be 2,038. Based on this population estimate, the calculated call volumes by type of call are provided in Table 10 below.

Table 10. Conceptual Calculated Call Volume

Type of Call	Per Capita Call Generation Factor	Number of Estimated Annual Calls (2,038 persons)
Total Other Calls	0.022	45
Total Fires	0.002	4
Total EMS Calls	0.071	145
Total Calls	0.095	194

As mentioned, the new industrial development will increase the call volume at a rate of a conservatively calculated 194 calls per year (4 calls per week or 16 calls per month). Fire Stations 66 and 20 combined emergency responses in 2021 totaled 7163 calls per year (2,607 and 4,556 respectively[6]), or 7.1 and 12.5 calls per day per station respectively. The level of service demand for the Project barely raises the overall call volume for the area. For perspective, five calls per day are typical in an urban or suburban area. A busy fire station company would be one with 10 to 15 or more calls per day. The expected number of potential calls per week

4 Sensitivity analysis based on RCFD 2016 TriData Report
5 2022 Riverside County Fire Department Annual Report, City of Beaumont Incidents for fiscal year 2022
6 Riverside County Fire Department Annual Report 2021

generated by the Project at full build out will be 4 calls, although the number will likely be lower than that based on the conservative nature of the population and calls per capita data used in this estimate. With additional assistance from Fire Station 106, Fire Stations 66 and 20 should not have a significant increase in call volume from the Project.

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5 Fire Safety Requirements- Infrastructure, Building Ignition Resistance, and Defensible Space

This FPP demonstrates that the Project development would comply with applicable portions of RCFD Technical Policies and Fire Prevention Standards and applicable portions of the Riverside County Municipal Code, Ordinances No. 460 and No. 787-11 and Title 8, Chapter 8.32 – Fire Code, which adopts the 2025 edition of the CFC, California Code of Regulations, Title 24, Part 9, with amendments. Furthermore, the Project will be consistent with applicable portions of Title 15, Chapter 15.04 – Building Regulations, which adopts the 2025 edition of the CBC based on the 2024 edition of the IFC as adopted and amended by RCFD, which governs the building, infrastructure, and defensible space requirements detailed in this FPP. The Project would also be subject to the provisions of section 4291 of the PRC regarding brush clearance standards around structures, the RCFD Defensible Space guidelines, and RCFD guidelines for Fuel Modification Plans. Being that the Project is in the SRA, California Code of Regulations Title 14, Fire Safe Regulations also applies. The Project will meet or exceed applicable codes or will provide alternative materials and/or methods. While these standards will provide a high level of protection to structures within the development, there are no guarantees that compliance with these standards will prevent damage or destruction of structures by fire in all cases. The following summaries highlight important fire protection features.

Prior to bringing combustible materials onto the Project site, utilities shall be in place, fire hydrants operational, an approved all-weather roadway, or an approved road surface alternative in place, and interim fuel modification zones established and approved.

A response map update, including roads and fire hydrant locations, in a format compatible with current RCFD mapping shall be provided to RCFD.

5.1 Roads

5.1.1 Access

Primary access to the Project site will be provided by Beaumont Avenue (SR-79). There will be two points of access off SR-79 onto the project site, one aligning with California Avenue in the northern portion of the Project site and the other located next to Building 3 in the southern portion of the Project site. There will be 30- to 40-foot-wide fire access roads around the perimeter of each warehouse. Roadways will provide access to within 150 feet of all portions of the structures served (2025 CFC, Section 503.1.1).

Project site access, including road widths and connectivity, will comply with the requirements of the Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A[7], which includes:

- Fire apparatus access roads, commonly referred to as fire lanes, shall be provided for every facility or building when any portion of an exterior wall of the first story is located more than 150 feet from an approved access roadway, as measured along an approved route.

[7] https://www.rvcfire.org/pdf/fire-marshal/guideline-ofm/FD%20Access%20%202023%20Guideline%20OFM-01A%20%20FINAL%201-31-2024.pdf?v=4149

- Fire apparatus access roads serving commercial or residential development shall be designed, constructed, and maintained to support the imposed loads of RVC fire apparatus with a total weight of 80,000 pounds. Apparatus weight is distributed as 55,000 pounds on tandem rear axles and 25,000 pounds on the front axle. The surface shall be designed, constructed, and maintained to provide all-weather driving capabilities.
- One road is required if any portion of an exterior wall of the first story of a building is located more than 150 feet from a fire access road. More than one road may be required when the project contains an industrial building exceeding 50,000 square feet.
- To protect fire apparatus, personnel, and equipment from damage and injury from falling debris, buildings taller than or equal to 40 feet in height require the edge of fire apparatus access roads to be located no closer than 20 to 40 feet from the building, the actual distance being a function of overall building height with consideration given to building construction, presence of openings, and other potential hazards.
- To ensure that fire apparatus mobility on properties with buildings taller than or equal to 30 feet in height is maintained at all times, Fire Truck Deployment Areas shall be provided along the road to permit fire apparatus to pass fire trucks that have outriggers extended. Consideration shall be given to the length of the road, roof and building design, obstructions to laddering, and other operational factors in determining the number, location, and configuration of Fire Truck Deployment Areas. Fire Truck Deployment Areas are typically required on at least two sides of the building. Road widths adjacent to Fire Truck Deployment Area shall be a minimum of 34 feet.
- All access roads shall comply with access road standards of a minimum clear width of 24 feet and an unobstructed vertical clearance of not less than 13 feet 6 inches. If trees are located adjacent to the fire access road, place a note on the plans stating that all vegetation overhanging the fire access road shall be maintained to provide a clear height of 13 feet, 6 inches.
- Access walkways must be a minimum of five feet in width and must be provided to all required egress doors from a building, all firefighter access doorways in buildings with high-piled storage, and the area beneath each rescue window in “R” occupancies, at a minimum. Access walkways will typically be required around the entire perimeter of a structure to facilitate control of a fire through any other available openings.
- Access walkways shall consist of a surface that lends itself to safe use during building evacuation, firefighting, and rescue efforts. Solid surface walkways such as concrete or asphalt are preferable, though alternative surfaces such as decomposed granite (DG), gravel, or grass may also be permissible. Ground covers and shrubs that prevent or impede laddering of structures are not permitted to be planted within access walkways. Where the grade itself presents a slip or fall hazard, an access walkway with a slip-resistant surface and/or stairway must be provided.

5.1.2 Surface and Grade

Fire access roads must be able to support fully loaded fire engines and be of a subtle enough grade to facilitate their travel. The surface and grade of all fire apparatus access roads associated with the Project comply with the requirements of the Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A, which includes:

- Fire apparatus access roads serving commercial or residential development shall be designed, constructed, and maintained to support the imposed loads of RVC fire apparatus with a total weight of 80,000 pounds. Apparatus weight is distributed as 55,000 pounds on tandem rear axles and 25,000 pounds on the front axle. The surface shall be designed, constructed, and maintained to provide all-weather driving capabilities.

- For fire apparatus access roads, a maximum of 6% (4 degrees) grade change is allowed for the initial 25 feet of approach or departure.
- The grade for access roads shall not exceed 14% (8 degrees). Cross-slope shall not be greater than 2.5% (1.43 degrees) for paved access roads.

5.1.3 Road Width and Clearance

Fire apparatus access roads must be of an appropriate width and clearance to facilitate the ingress and egress of engines. The width and clearance of fire access roads associated with the Project comply with the requirements of the Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A and Title 14 Minimum Fire Safe Regulations, which include:

- The minimum clear width of a fire apparatus access road is 24 feet.
- Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches. If trees are located adjacent to the fire access road, place a note on the plans stating that all vegetation overhanging the fire access road shall be maintained to provide a clear height of 13 feet, 6 inches.
- No road or road structure shall have a horizontal inside radius of curvature of less than fifty (50) feet. An additional surface width of four (4) feet shall be added to curves of 50-100 feet radius; two (2) feet to those from 100-200 feet
- No parking or other obstruction (e.g.: trash receptacles) are permitted on roads that are narrower than 32 feet in width. Parking on one side is permitted on a road that is at least 32 feet but less than 40 feet in width. Parking on two sides is permitted on a road 40 feet or more in width.

5.1.4 Aerial Fire Apparatus Access Road

Aerial fire apparatus access roads meeting the 2025 CFC requirements below exist around the perimeter of the four industrial buildings:

- Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet, approved aerial fire apparatus access roads shall be provided (CFC Section D105.1).
  - Exceptions to this requirement include buildings of Type IA, Type IB or Type IIA construction equipped throughout with an automatic sprinkler system in accordance with CFC Section 903.3.1.1 and having fire fighter access through an enclosed stairway with a Class I standpipe from the lowest level of fire department vehicle access to all roof surfaces, but must be approved by an RCFD official.
- Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet, exclusive of shoulders, in the immediate vicinity of the building or portion thereof (CFC Section D105.2).
- One or more of the required aerial fire apparatus access routes shall be located not less than 15 feet and not greater than 30 feet from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the fire code official (CFC Section D105.3). Overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the fire code official (CFC Section D105.4).

5.1.5 Fire Lane Marking

Fire lane identification will be required when it is necessary to restrict parking of vehicles to maintain the required width of fire access roads for emergency vehicle use. Fire lane markings associated with the Project will be in compliance with the Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A, which includes:

- Specific areas designated by RVC as fire lanes shall be marked with red curbs. In addition, all entrances from public streets into the area marked with fire lanes shall be posted with approved fire lane entrance signs. Other uniquely shaped spaces may be required to be designated as a FIRE LANE to prevent obstruction. This may be accomplished by outlining the FIRE LANE portion of the area with red paint and adding additional diagonal red markings within the designated area.
- "Fire Lane—No Parking" signs shall be posted immediately adjacent to each designated fire lane and at intervals not to exceed 75 feet. In addition, all entrances from public streets into the area marked with fire lanes shall be posted with fire lane entrance signs. Alternative signs must be approved through RVC – OFM.

5.1.6 Gates

Gates on private roads are permitted, but subject to the adopted Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A and Title 14 Minimum Fire Safe Regulations, which include:

- Proposed gates crossing fire apparatus access roads must be shown on the plans. Information such as the location, type of gate (e.g., swinging, sliding), dimensions, and method of operation (manual, electric) must also be provided. Typical gate designs may include sliding gates, swinging gates or arms, or guard posts with a chain traversing the opening.
- Security gates shall not be installed without approval. Where security gates are installed, they shall have an approved means of emergency operation. Approval shall be by the local authority having jurisdiction. The security gates and the emergency operation shall be maintained operational at all times.
- Gated entries located for egress and ingress of vehicles shall not be less than 24 feet clear width on not less than one side of a center median. The vertical clearance shall not be less than 13 feet 6 inches, including landscaping and/or trees or other obstructions. Roads leading up to and beyond the guard house or gate shall meet standard fire lane width requirements. Additional vehicle access gates located elsewhere on commercial property shall be a minimum of 24 feet in width.
- Gates and barriers shall be located a minimum of 46 feet from any major street. If existing conditions prevent installation of the minimum setback, documentation supporting an acceptable alternative shall be provided. The alternative solution must facilitate emergency ingress without endangering emergency response personnel, emergency apparatus, and the general public. The alternative shall be subject to review and approval.
- For gates and barriers that are not used on a frequent basis or those that are located such that they have a reasonable likelihood of being blocked by vehicles, vegetation, furniture, or other obstructions (e.g., secondary fire department vehicle ingress/egress points, gates accessed from plazas), permanent signage constructed of 18-gauge steel or equivalent shall be attached on each face of the gate or barrier that reads "FIRE LANE—NO PARKING."

- Manually operated gates and barriers shall have Knox padlocks, or weather-resistant Knox key boxes. The key box shall be placed four to five feet above the road surface at the right side of the access gate in a conspicuous location that is readily visible and accessible. The key box must be clearly labeled "FIRE DEPT." (CFC 506)

Electronically Operated Gates

- Electric gate openers shall comply with UL 325. In the event of loss of normal power to the gate operating mechanism, it shall be automatically transferred to a fail-safe mode allowing the gate to be pushed open by a single firefighter without any other actions, knowledge, or manipulation of the operating mechanism being necessary and without the use of battery back-up power; this shall be noted on the plan. The manufacturer's specification sheet demonstrating compliance with this method of operation during power loss shall be provided or scanned directly onto the plan. Should the gate be too large or heavy for a single firefighter to open manually, a secondary source of power by means of an emergency generator or a capacitor with enough reserve to automatically and immediately open the gate upon loss of primary power shall be provided.
- The gate control for electronic gates shall be operable by a Knox emergency override key switch (with dust cover). The key switch shall be placed between 42" and 48" above the road surface at the right side of the access gate within two feet of the edge of the road. The key switch shall be readily visible and unobstructed from the fire lane leading to the gate. The key switch shall be clearly labeled "FIRE DEPT."
- Upon activation of the key switch, the gate shall open and remain open until returned to normal operation by means of the key switch. Where a gate consists of two leaves, the key switch shall open both simultaneously if operation of a single leaf on the ingress side does not provide for the width, turning radii, or setbacks necessary for fire apparatus to navigate the vehicle entry point. Note this requirement on the plan.
- The key switch shall be labeled with a permanent red sign with not less than ½" contrasting letters reading "FIRE DEPT" or with a "Knox" decal. Note this requirement on the plan.
- New motorized gates shall also be equipped with optical receivers to allow emergency response personnel to remotely open the gate when the emergency vehicle approaches the gate. The receiver shall be located to maximize signal reception from an approaching RVC apparatus. Devices shall be compatible with RVC preemption devices.
- Gate or barrier locks shall be reviewed and approved prior to their installation on any new and/or existing access gate.

5.1.7 Key Boxes

All new structures will comply with RCFD Technical Policy 06-003[8] and Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A as follows:

- Knox devices shall be provided where necessary to ensure that immediate access for firefighting, rescue, and other emergency purposes is possible. Knox equipment locations shall be shown on access plans. At a minimum, Knox devices shall be provided for the following locations:
  - Gates along the paths of firefighter travel from the fire lane to all points along the perimeter of the structure.

8 https://rvcfire.org/pdf/fire-marshal/technical-policies/TP06-003-EmergencyAccessKeyBoxes-01072020.pdf?v=180

  - Exterior doors to buildings, rooms containing main fire alarm panels, annunciators, and/ or fire suppression systems.
  - Doors and gates to other areas identified by RVC-OFM.
- Knox boxes or switches shall be located adjacent to and clearly visible from the gate or door served. They shall be securely mounted to a wall or fence at a height of 6 feet above grade in a location that is easily accessible to firefighters.
- The key used to unlock the gate or door shall be kept in the key box. When the key unlocks more than the individual adjacent gate or door, a label or tag shall be attached to the key identifying the gates or doors it operates. Where multiple gates or doors are served by a single box, two or more copies of the key(s) are recommended so that a copy will be available to each engine/ truck company responding to the site. All keys must have an address tag attached.
- When a Knox cabinet is specified, it shall contain floor plans, chemical inventories, SDS and other materials used to facilitate a response.
- Electromagnetically or electromechanically locked pedestrian gates and doors shall be equipped either with a Knox box containing a key to open the lock or, if the door lock cannot be operated with a key from the exterior, a Knox key switch shall be provided adjacent to the door. Where key switches are provided, the door or gate lock shall remain disengaged until the key switch is returned to the "normal" closed or locked position.

5.1.8 Premises Identification

Identification of roads and structures will comply with Riverside County Fire Department Access Requirements for Commercial & Residential Development Guideline OFM-01A and Title 14 Minimum Fire Safe Regulations, which include:

- Approved numbers or addresses shall be placed on the front elevation of all new or existing buildings in such a position that is plainly visible and legible from the street or road on which the property is addressed. Addresses shall not be located where they have the potential of being obstructed by signs, awnings, vegetation, or other building/site elements. An address monument at the vehicle entrance or other location clearly visible and legible from the public road may be provided in lieu of an address on the structure where only a single building with a single street address is present and no other structures are accessible from the fire apparatus access road serving that structure (CBC 501.2, CFC 505.1).
- The numbers/ letters shall contrast with their background. Address numbers must be a minimum of 24 inches when the building exceeds 25 feet, and the numbers shall have a minimum 1/2-inch stroke. When a building contains multiple addresses, an address range may be posted on the structure.
- Buildings that are set back from the primary roads more than 150 feet or otherwise not visible from the public road, shall have a monument provided as approved by RVC-OFM.
- Numbers for new buildings shall be internally or externally illuminated, to be visible at night. This requirement also applies to monuments.
- Where it is unclear as to which street a building is addressed to (e.g., a building is accessed only from a street other than the one it is addressed to; multiple main entrances to the site or building itself front different streets), the name of the street shall also be identified as part of the posted address.
- Approved numbers or addresses shall be placed on the front elevation(s) of all buildings that form the cluster. If all building addresses are not clearly visible or legible from the public road serving the structures,

an address monument shall also be provided at the entry point(s) to the site indicating the range of addresses accessible from that entrance.

- In all cases, the address shall be posted at the beginning of construction and shall be maintained thereafter.
- Newly constructed or approved roads must be identified by a name or number through a consistent system that provides for sequenced or patterned numbering and/or non-duplicative naming within each local jurisdiction. Road signs shall be visible and legible from both directions of vehicle travel for a distance of at least one hundred (100) feet. Signs required by this article identifying intersecting roads shall be placed at the intersection of those roads. The size of letters, numbers, and symbols for road signs shall be a minimum four (4) inch letter height, half inch (.5) inch stroke, reflectorized, contrasting with the background color of the sign. Road signs required by this article shall be posted at the beginning of construction and shall be maintained thereafter.

5.1.9 Ongoing Infrastructure Maintenance

Project Owner/Property Management Company shall be responsible for long-term funding and maintenance of fuel modification zones; however, this responsibility may be transferred to the tenant by an appropriate lease agreement.

5.1.10 Pre-Construction Requirements

Prior to bringing lumber or combustible materials onto the Project site, improvements within the active development area shall be in place, including utilities, operable fire hydrants, an approved, temporary roadway surface, and construction phase fuel modification zones established. These features will be approved by the fire department or their designee prior to combustibles being brought on-site.

A preconstruction meeting with the Riverside County Fire Prevention Unit assigned to Beaumont is advised, prior to the start of underground installation.

5.2 Ignition Resistant Construction and Fire Protection Systems

All new structures within the Project site will be constructed to Fire Code standards. Each of the proposed buildings will comply with the enhanced ignition-resistant construction standards of the 2025 CWUIC (Chapter 5). These requirements address roofs, eaves, exterior walls, vents, appendages, windows, and doors and result in hardened structures that have been proven to perform at high levels (resist ignition) during the typically short duration of exposure to burning vegetation from wildfires. Appendix D provides a summary of the requirements for ignition resistant construction.

While these standards will provide a high level of protection to structures in this development, there is no guarantee that compliance with these standards will prevent damage or destruction of structures by fire in all cases.

5.3 Fire Protection Systems

5.3.1 Water Supply

Water service for the Beaumont Heights Business Centre Project site will be provided by Beaumont Cherry Valley Water District. The Project site is within the District's Sphere of Influence and will be annexed into the District's water supply system boundary

The Project will be consistent with County requirements for fire flow and fire hydrant requirements within a VHFHSZ. All water storage and hydrant locations, mains, and water pressures would be designed to fully comply with Riverside County Fire Code Fire Flow Requirements. As detailed in the County Fire Code Section 8.32.050 and California Fire Code Section 903.2, all structures within the development are required to have an NFPA 13 consistent automatic fire sprinkler systems based on the latest adopted Building and Fire Codes for occupancy types. An RCFD official will be notified prior to a water supply test or provided with approved documentation before approval of the water supply system (CFC Section 507.4).

5.3.2 Hydrants

Fire hydrants will be located along fire access roadways and adjacent to each structure, as determined by the RCFD Fire Marshal and current fire code requirements to meet operational needs. Fire hydrants will be consistent with applicable codes and Riverside County Fire Department Water Supply and Fire Hydrant Requirements for Commercial & Residential Development Guideline OFM-01B[9]. More specifically:

- Hydrants shall be located at street intersections for both public and private streets. Hydrants must be located no more than three feet from the edge of a fire apparatus access road and cannot be located in areas where they will be visually or operationally obstructed (behind fences or walls, in bushes, behind parking spaces, etc.). Clearance shall be provided to a distance no less than three feet from the perimeter of the hydrant.
- The hydrant outlets must face the fire apparatus access road. Where all of the outlets cannot face the fire access road (e.g., the hydrant is located in a landscape peninsula or island in a parking lot; the hydrant has three outlets), the 4" outlet(s) shall take precedence.
- Hydrants shall be located at least 40 feet from the building(s) it serves. Where it is impractical to locate hydrants 40 feet from adjacent structures, hydrant spacing shall be reduced by 50% to provide alternative hydrants for use by fire department personnel responding to an emergency.
- The hydrant or fire valve shall be eighteen (18) inches above the finished surface. Its location in relation to the road or driveway and to the building(s) or structure(s) it serves shall comply with California Fire Code, California Code of Regulations title 24, part 9, Chapter 5, and Appendix C.
- The hydrant head shall be a two and half (2 1/2) inch National Hose male thread with cap for pressure and gravity flow systems and four and a half (4 1/2) inch for draft systems.
- Hydrants with a primary function of connection to a Fire Engine for the purpose of pumping an FDC shall be located so that a hose line running between the hydrant, fire engine, and the fire department connection(s) (FDCs) does not exceed 100 feet.

[9] https://rvcfire.org/pdf/fire-marshal/guideline-ofm/FD%20Water%20Supply%20and%20Fire%20Hydrant%202023%20Guideline%20OFM-01B%20FINAL%201-30-2024%202024.pdf?v=5434

- Hydrants and fire department connections shall not be located behind parking stalls or in other locations where they are likely to be blocked by vehicles or other objects.
- Hydrants and fire department connections should not be located where apparatus staged at these appurtenances would then encroach on minimum fire apparatus turning radii unless alternative routes are available.
- If vehicles can approach the hydrant from more than one direction, the hydrant shall be protected by four bollards of concrete-filled pipe four inches in diameter and mounted in concrete in a square around the hydrant. The bollards need to be spaced a minimum of three feet from the perimeter of the hydrant. Two bollards may protect hydrants that can be approached from only one side. Hydrants may not require protection by bollards if they are located such that the potential for collision is minimal or if they are sufficiently protected by a standard concrete curb at least six inches in height.
- Blue reflective pavement markers ("blue dots") shall be used to identify fire hydrant locations. On two-way streets and roads, markers shall be placed six inches from the edge of the painted centerline or from the approximate center of streets without a painted centerline on the side nearest the hydrant.
- Public hydrants shall be painted Chrome Yellow, or any color (other than red) as specified by the local water purveyor or City Ordinance.

5.3.3 Fire Sprinklers

All structures, of any occupancy type, will be protected by an automatic, internal fire sprinkler system. Fire sprinklers systems will be in accordance with RCFD, and National Fire Protection Association (NFPA) Standard 13 (Per CFC Section 903.2). Fire sprinkler plans for each structure will be submitted and reviewed by RCFD for compliance with the applicable fire and life safety regulations, codes, and ordinances as well as compliance with RCFD Technical Policy 14-001[10], included below. Actual system design is subject to final building design and the occupancy types in the structure.

- Automatic fire sprinkler system risers shall not be obstructed in any manner. If a system riser is to be concealed by means of a wall, soffit, column, or other building construction, it shall be provided with eighteen (18) inch clearance to each side and to the front of the system riser. Access shall be provided by means of a door with the minimum dimensions two (2) feet six (6) inches in width by six (6) feet eight (8) inches in height from the exterior of the building directly to the riser as approved by the fire code official.

5.4 Defensible Space and Vegetation Management

5.4.1 Defensible Space

WUI fire protection requires a systems approach, which includes the components of infrastructure and water, structural safeguards (addressed in the FPP), and adequate defensible space setbacks. This section provides defensible space details for the Project.

10 https://rvcfire.org/pdf/fire-marshal/technical-policies/TP14-001-NewSprinklerRiserAccessibility-01072020.pdf?v=6433

5.4.2 Fuel Modification Zone Requirements

A fuel modification zone (FMZ) is a strip of land between a structure and open space acting as a buffer where combustible vegetation has been removed and/or modified and partially or totally replaced with more appropriately spaced, drought-tolerant, fire resistant plants in order to provide a reasonable level of protection to structures from wildland fire. A typical landscape/fuel modification installation requires a 100-foot-wide fuel modification zone from the structure outwards towards undeveloped areas. This 100-foot-wide fuel modification zone is required to provide defensible space which is defined as managed and maintained areas adjacent to structures that enable fire suppression activities through the removal of flammable fuels and maintenance of landscapes that would not readily transmit wildfire. Defensible space enables firefighters to safely position themselves at the development edge and begin tactical protection efforts. For the Project, the first 100 feet around each of the proposed structures is primarily paved parking, with only some landscaped areas within the 100-foot FMZ. The paved areas provide total fuel modification as all fuels will be removed and replaced with noncombustible concrete. The landscaped areas interspersed within the 100-foot strip will comply with FMZ requirements (refer to section 5.4.2.2). In some places, the paved parking lots extend 300 feet from the buildings, far exceeding the 100-foot requirement (further tract specific detail below).

As wildfire approaches the paved and landscaped areas of the FMZ, fire behavior is affected substantially reducing flame lengths, spread rates and intensity, thus causing wildfires to weaken as they struggle to find available fuels. Fuel modification zones (FMZs) or “brush management” was initially made part of the Public Resources Code 4290 and 4291 to protect natural resources from fires originating in neighboring developed areas and have since become focused on protecting communities and structures. However, FMZs, or fuel maintenance zones, as will be used for the Project, continue to have the same benefit of buffering preserved open space areas from accidental ignitions within developments. Positioning the low plant density, irrigated zone directly adjacent to the structure provides a significant buffer between the structure and other landscape fire and native vegetation. The same way that fuel modification will set back a wildland fire from a structure, the fuel modification will set back a structure fire from the more burnable native plants. Embers can be generated by a structure fire and can be blown over the fuel modification into native fuels, but the inclusion of automatic sprinklers in every building combined with the presence of staffed fire stations with fast response significantly reduces the potential for a structure fire to reach a size that would produce significant impacts. The highest likelihood of vegetation ignitions would be related to the usage of roadways. Further, as depicted in the fire behavior modeling for existing and post-Project conditions, the Project at buildout would reduce the overall risk of wildfire spreading off site with implementation of the fire safety requirements, defensible space, and vegetation management outlined in this FPP.

Cohen (1995) performed structure ignition fire research studies that suggest, as a rule-of-thumb, larger flame lengths and widths require wider fuel modification zones to reduce structure ignition. For example, valid Structure Ignition Assessment Modeling results indicate that a 20-foot-high flame has minimal radiant heat to ignite a structure (bare wood) beyond 33 feet (horizontal distance). Whereas a 70-foot-high flame requires about 130 feet of clearance to prevent structure ignitions from radiant heat (Cohen and Butler 1996). For this fire study example, bare wood was used, which is more combustible than the fire rated concrete tilt-up exterior walls that will be used in the Project.

Based on the conceptual Project site plan, the project has more than adequate on-site defensible space which consists of concrete roadways, parking stalls, and irrigated landscaping.

Industrial Building 1- In the conceptual plan, the first industrial building is located in the northern portion of the project site. It is set back from the property line by between approximately 425 and 745 feet; in between the building and property line there are concrete paved roadways, automobile and trailer parking stalls, and irrigated landscaping. Along the entire eastern and western perimeters of Building 1 are 40-foot wide fire apparatus access roads, in addition to 30-foot wide fire apparatus access roads along the northern and southern perimeters of the industrial building. Beaumont Avenue (SR-79) marks the western boundary of the Project site.

Industrial Building 2- In the conceptual plan, the second industrial building is located south of Building 1. It is set back from the property line between approximately 400 and 810 feet; in between the building and property line there are concrete paved roadways, parking stalls, and irrigated landscaping. Along the entire eastern and western perimeters of Building 2 are 40-foot wide fire apparatus access roads, in addition to 30-foot wide fire apparatus access roads along the northern and southern perimeters. Beaumont Avenue (SR-79) marks the western boundary of the Project site.

Industrial Building 3- In the conceptual plan, the third industrial building is located south of building 2. It is set back from the property line between approximately 510 and 980 feet; in between the building and property line there are concrete paved roadways, parking stalls, and irrigated landscaping. Along the entire eastern and western perimeters of Building 3 are 40-foot wide fire apparatus access roads, in addition to 30-foot wide fire apparatus access roads along the northern and southern perimeters. Beaumont Avenue (SR-79) marks the western boundary of the Project site.

Industrial Building 4- In the conceptual plan, the fourth industrial building is the southernmost building on the Project site. It is set back from the property line between approximately 305 and 1050 feet; in between the building and property line there are concrete paved roadways, automobile and trailer parking stalls, and irrigated landscaping. Along the entire eastern and western perimeters of Building 4 are 40-foot wide fire apparatus access roads, in addition to 30-foot wide fire apparatus access roads along the northern and southern perimeters.

Appendix E, Conceptual Site Fuel Modification Plan shows the locations where the fuel modification area is to be located.

Vegetation management will also be implemented as an interim fuel management area throughout the construction phases for each structure. Since construction is estimated to take seven years, there may be a period where developing phases are exposed on multiple sides to wildland fuels. The FMZs will be implemented according to the following requirements for the entire Project.

5.4.2.1 Fuel Modification Zone 0 – Ember Resistant Zone

The Ember-Resistant Zone is applicable site-wide and is measured from the exterior wall of the structures outward to 5-feet (horizontal). The ember-resistant zone is designed to keep fire or embers from igniting materials that can spread the fire to the structure. This zone shall be constructed of continuous hardscape or non-combustible materials acceptable to the FAHJ. The Project's property owner is responsible for the removal of combustible materials surrounding exterior wall areas and maintaining areas free of combustible materials. The use of mulch and other combustible materials shall be prohibited.

The Ember-Resistant Zone includes the following key components:

- The use of hardscaping like gravel, pavers, concrete, and other non-combustible materials. No combustible bark or mulch.
- Remove all dead and dying weeds, grass, plants, shrubs, trees, branches, and vegetative debris (leaves, needles, cones, bark, etc.).
- Remove and/or maintain all tree branches within 10 feet of the roof or side of the building.
- Limit plants in this area to low growing, nonwoody, properly watered and maintained plants.
- Relocate pallets, firewood, and lumber to be a minimum 30 feet or more from the structure.
- Replace combustible fencing, gates, and other structures within this zone to non-combustible materials.
- Vegetation shall be limited to heights not exceeding 18 inches.
- Vegetation shall be irrigated.
- Relocate garbage and recycling containers outside this zone when possible.
- Relocate vehicles outside this zone when possible.

5.4.2.2 Fuel Modification Zone 1 – Lean, Clean, and Green Zone

The FMZ occurs around the perimeter of the Project's wildland exposure at Project build out (Appendix E). Zone 1 extends 30 feet from buildings and structures or to the property line, whichever is closer. All highly flammable native vegetation, especially found on the Prohibited Plant List (Appendix F) shall be removed except for species approved by the fire marshal. This area will largely be paved with some irrigated landscaping. The Project's plant palette will be approved by the fire department. A permanent, automatic irrigation system will be installed throughout the Project to maintain hydrated plants. Zone 1 includes the following key components:

- All trees shall be planted and maintained at a minimum of 10 feet from the tree's drip line to any combustible structure.
- Tree spacing of a minimum 10 feet between canopies.
- Mature trees shall be limbed to six feet or three times the height of understory plants to prevent ladder fuels, whichever is greater.
- No tree limb encroachment within 10 feet of a structure.
- Tree maintenance includes limbing-up (canopy raising) six feet or one-third the height of the tree.
- Maintenance including ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying plantings, maintenance of the programming and functionality of the irrigation system, regular trimming to prevent ladder fuels.
- Trees and tree form shrub species that naturally grow to heights that exceed two feet shall be vertically pruned to prevent ladder fuels.
- Grasses shall be cut to four inches in height. Native grasses can be cut after going to seed.
- Ground covers within the first three feet from structure restricted to non-flammable materials, including stone, rock, concrete, bare soil, or other.
- Requires regular maintenance such as thinning or removal of plants focusing on removal of dead annual grasses.
- Fuel continuity should be interrupted so that groupings of shrubs are separated from adjacent groupings.

- Maintenance including ongoing removal and thinning of dead/dying planting, and regular trimming to prevent ladder fuels.
- Trees and tree-form shrub species that naturally grow to heights that exceed four feet shall be vertically pruned up 1/3 of their height or six feet above the ground, whichever is less, to prevent ladder fuels.
- No vegetation found on the Prohibited Plant List (Appendix F) shall remain in the fuel maintenance zone.

5.4.2.3 Fuel Modification Zone 2 – Reduce Fuel Zone

Zone 2 extends from 31 feet to 100 feet out from buildings and structures or to the property line, whichever is closer. Zone 2 includes the following key components:

- Trim annual grass to a maximum height of four inches.
- Space out shrubs and trees horizontally.
- Ensure vertical spacing between grass, shrubs, and trees.
- Remove fallen leaves, needles, and small branches, but can leave up to three inches.
- Keep exposed wood piles at least 10 feet clear from surroundings, down to the soil.
- Ensure outbuildings and LPG tanks have 10 feet of clear space to bare soil and no flammable vegetation within an additional 10 feet around them.

5.4.3 Vegetation Management Maintenance

Vegetation management, i.e., assessment of the fuel modification zones' condition and removal of dead and dying and undesirable species; as well as thinning as necessary to maintain specified plant spacing and fuel densities, shall be completed annually by May 1 of each year, and more often as needed for fire safety, as determined by the RCFD. The vegetation management will be funded by the Project and shall be conducted by their contractor(s). The Project shall be responsible for all vegetation management throughout the development, in compliance with the Project FPP that is consistent with requirements.

The permanent fuel maintenance zone required for the Project will be maintained by the applicant during construction and by the owner or a Property Management Company/Association which will be responsible for vegetation management once the Project is built out. The Owner or Property Manager will be responsible for streetscape and vegetation management in perpetuity.

On-going/as-needed fuel modification maintenance during the interim period while the Project is built out will include necessary measures for consistency with the FPP, including:

- Regular maintenance of undisturbed open space on project site in accordance with weed abatement regulations.
- Removal or thinning of undesirable combustible vegetation and replacement of dead or dying landscaping.
- Maintaining ground cover at a height not to exceed 18 inches. Annual grasses and weeds shall be maintained at a height not to exceed three inches.
- Removing accumulated plant litter and dead wood. Debris and trimmings produced by thinning and pruning should be removed from the Project site or chipped and evenly dispersed in the same area to a maximum depth of four inches.

- Maintaining manual and automatic irrigation systems for operational integrity and programming. Effectiveness should be regularly evaluated to avoid over or underwatering.
- Complying with these FPP requirements on a year-round basis. Annual inspections are conducted following the natural drying of grass and fine fuels, between the months of May and June, depending on precipitation during the winter and spring months.

5.4.4 Environmentally Sensitive Areas/Open Space

There should not be a need to modify the fuel maintenance zone as it is planned to meet the fuel management needs of the Project site and comply with the fire code. However, if unforeseen circumstances were to arise that require hazard reduction within an area considered environmentally sensitive or part of the Multispecies Conservation Plan, it may require approval from the County and the appropriate resource agencies (California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers) prior to any vegetation management activities occurring within those areas.

5.4.5 Prohibited Plants

Certain plants are considered prohibited in the landscape due to characteristics that make them highly flammable. These characteristics can be physical (structure promotes ignition or combustion) or chemical (volatile chemicals increase flammability or combustion characteristics). The plants included in the Prohibited Plant List (Appendix F) are unacceptable from a fire safety standpoint and will not be planted on the Project site or allowed to establish opportunistically within fuel modification zones or landscaped areas.

5.4.6 Construction Phase Vegetation Management

Vegetation management requirements shall be implemented at Project commencement and throughout the construction phase for each planning area. Vegetation management will be performed pursuant to the FAHJ on all building locations prior to the start of work and prior to any import of combustible construction materials. Adequate fuel breaks will be created around all grading, site work, and other construction activities in areas where there is flammable vegetation.

6 Wildfire Education Program

The business owners of the Beaumont Heights Business Centre Project will be provided with a proactive educational component disclosing the potential wildfire risk and this report's requirements. This educational information must include maintaining the landscape and structural components according to the appropriate standards and embracing a "Ready, Set, Go!" stance on evacuation. Additionally, management of on-site entities occupying the site's structures will be required to register for emergency alerts via the Alert RivCo messaging system (https://rivcoready.org/alert-rivco). Personnel and employees will be strongly encouraged to also register to receive emergency alerts.

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7 Evacuation Analysis

A wildfire evacuation study is being prepared by Dudek. Please refer to that separate technical report for details regarding evacuation planning, timing available and time needed to evacuate the site, and discussion of other available contingency options that may be employed by emergency managers.

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8 Conclusion

This FPP for the Beaumont Heights Business Centre Project provides guidance for vegetation maintenance for the proposed fuel maintenance zones and landscaped areas on the Project site. As described, vegetation maintenance measures will be provided on all sides of the proposed development. The requirements and recommendations provided in this FPP have been designed specifically for the Project. This analysis and its fire protection justifications are supported by fire science research, results from previous wildfire incidents, and fire agencies that have approved these concepts. The Project design features, including concrete paved roads and parking stalls, and a fully irrigated landscape, provide over a 100-foot wide FMZ. The Project is considered to represent a low wildfire risk to its occupants based on its fire protection design features and its ability to provide for evacuations and contingency on-site shelter in place.

Ultimately, it is the intent of this FPP to guide the fire protection efforts for the Project in a comprehensive manner. Implementation of the measures detailed in this FPP will reduce the risk of wildfire spreading from the Project site into surrounding areas and will improve the ability of firefighters to fight fires on the Project site and neighboring properties and resources, irrespective of the cause or location of ignition.

It must be noted that during extreme fire conditions, there are no guarantees that a given structure will not be exposed to wildfire or embers. Precautions and minimizing actions identified in this report are designed to reduce the likelihood that fire will impinge upon the Project's assets or threaten its visitors. Additionally, there are no guarantees that fire will not occur in the area or that fire will not damage property or cause harm to persons or their property. Implementation of the required enhanced construction features provided by the applicable codes and the fuel modification requirements provided in this FPP will reduce the Project site's vulnerability to wildfire and help to limit the spread of fire from the Project site to surrounding areas. It will also help accomplish the goal of this FPP to assist firefighters in their efforts to defend structures.

It is recommended that the Beaumont Heights Business Centre maintains a conservative approach to fire safety. This approach must include maintaining the landscape and structural design components according to the appropriate standards and embracing a "Ready, Set, Go!" stance on evacuation. The Project is not to be considered a shelter-in-place development. However, fire agencies and/or law enforcement officials may, during an emergency, as they would for any new development providing the layers of fire protection as the Project, determine that it is safer to temporarily refuge employees or visitors on the Project site. When an evacuation is ordered, it will occur according to pre-established evacuation decision points or as soon as notice to evacuate is received, which may vary depending on many environmental and other factors. Fire is a dynamic and somewhat unpredictable occurrence, and it is important for anyone working in the WUI to educate themselves on practices that will improve safety.

Any person or entity furnished with this report and/or who reviews it agrees that the advance written consent of Dudek be sought and furnished to such person or entity prior to the review, reliance or authorization as to any matters that are the subject of the reports by any person or entity (whether through act or omission as set forth in the report), other than Dudek's direct client. In such case, obtaining Dudek's consent shall not be subject to any fee or charge (other than reasonable copy costs, where applicable).

Dudek expressly disavows, does not assume any responsibility for, nor will be liable for any claims, losses, or damages associated with any matters that are the subject of this or other reports it prepares or contributes to

respecting this project, however characterized (including without limitation as sounding in tort, breach of contract, misrepresentation by act or omission, failure to adhere to applicable standards of professionalism, statutory liability, etc.), whether in law or equity, whether known or unknown, and whether actual or contingent, excepting only Dudek's direct client, as to which the limitation of liability provisions in the contract between Dudek and its client shall govern.

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Appendix A

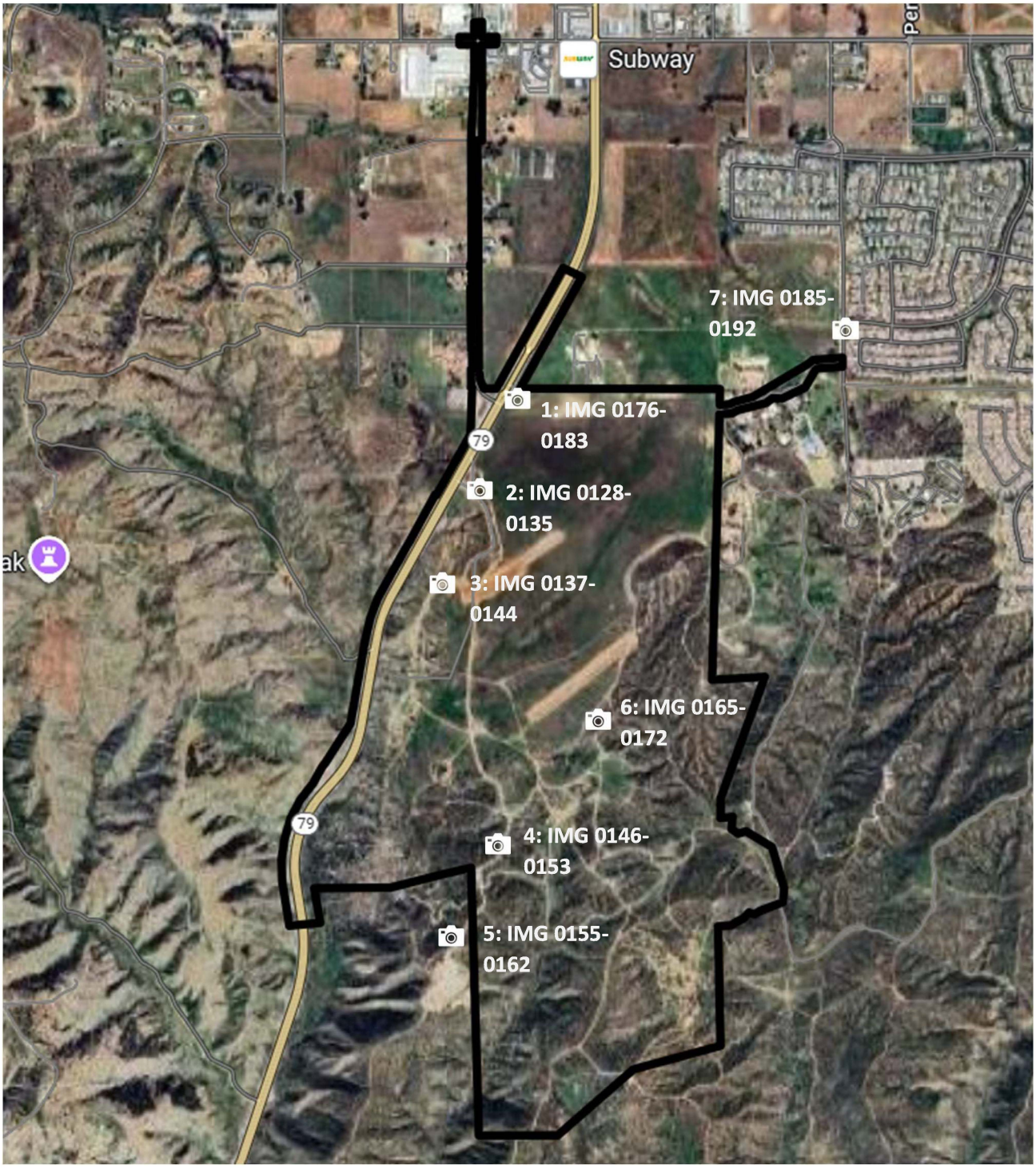
Representative Project Site Photographs

BEAUMONT HEIGHTS BUSINESS CENTRE (4/18/2025)

APPENDIX A

PHOTO LOG

PHOTO LOCATION KEY



Picture 1: IMG 0179 Taken at the northwest corner of the Project site along Beaumont Avenue (SR-79) looking southeast over the Project area. The northern portion of the Project site is relatively flat with a slight upward slope to the east. Vegetation on the northern portion of the Project site is grass.

Picture 2: IMG 0181 Taken at the northwest corner of the Project site along Beaumont Avenue (SR-79) looking southwest off the Project site. Vegetation on the northern portion of the Project site is grass. Vegetation offsite to the west is mixed grass and shrubs.

Picture 3: IMG 0134 Taken at the western boundary of the Project site looking west off the project site. Note SR-79 adjacent to western Project boundary and the offsite topography slopes upwards towards the west. Vegetation offsite to the west is mixed grass and shrubs.

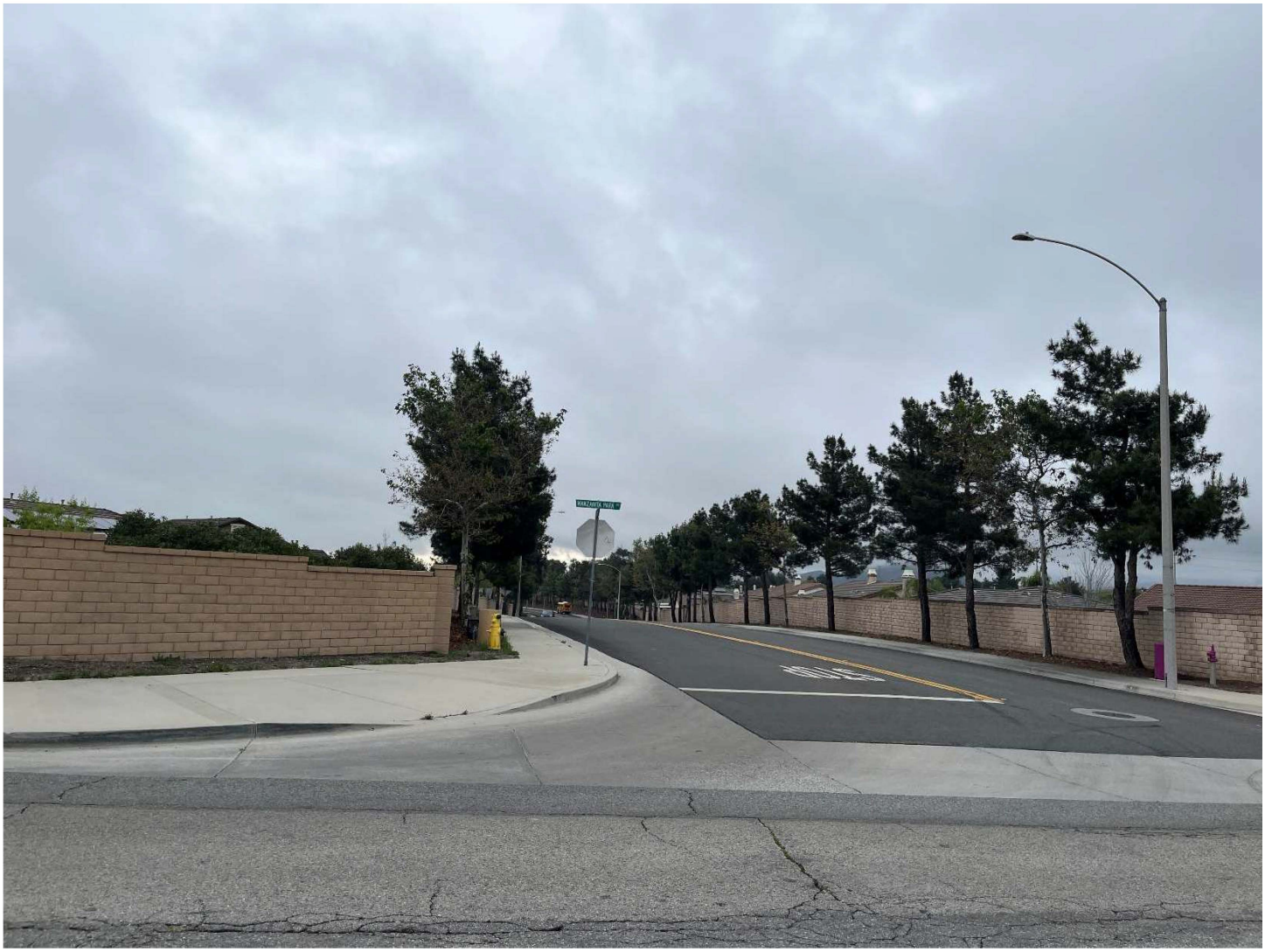
Picture 4: IMG 0140 Taken at the western boundary of the Project site looking southeast over the Project site. Topography slopes upwards towards the south. Vegetation on the northern portion of the Project site is grass, while the southern portion of the Project site is dense shrubs.

Picture 5: IMG 0149 Taken at the southwestern boundary of the Project site looking southeast over the Project site. Topography slopes upwards towards the south and east. Note powerlines bisect the Project site. Vegetation in the southern portion of the Project site is dense shrubs.

Picture 6: IMG 0151 Taken at the southwestern boundary of the Project site looking southwest away from the project area. Topography slopes upward towards the south and west. Vegetation on and off-site is mixed with grass and shrubs. Powerlines continue offsite to the west.

Picture 7: IMG 0156 Taken at the southern portion of the Project site looking northeast over the Project site. Topography slopes upward towards the east. Vegetation on the southern portion of the Project site is dense shrubs.

Picture 8: IMG 0166 Taken towards the middle of the Project site looking northeast over the Project site. Project site is relatively flat, with a slight upward slope towards the east. Vegetation on the northern portion of the Project site is grass, while the southern portion of the Project site is dense shrubs.



Picture 9: IMG 0187 Taken offsite of the northeastern boundary looking east, away from the Project site. Note offsite residential development.

Picture 10: IMG 0190 Taken offsite of the northeastern boundary looking southwest towards the Project site. Topography slopes upward towards the south. Vegetation offsite is grass.

Appendix B

Beaumont Heights Business Centre
Project Vicinity Fire History Map

Appendix C

BehavePlus Fire Behavior Analysis

1 BehavePlus Fire Behavior Modeling History

Fire behavior modeling has been used by researchers for approximately 50+ years to predict how a fire will move through a given landscape (Linn 2003). The models have had varied complexities and applications throughout the years. One model has become the most widely used as the industry standard for predicting fire behavior on a given landscape. That model, known as "BEHAVE", was developed by the U. S. Government (USDA Forest Service, Rocky Mountain Research Station) and has been in use since 1984. Since that time, it has undergone continued research, improvements, and refinement. The current version, BehavePlus 6.0, includes the latest updates incorporating years of research and testing. Numerous studies have been completed testing the validity of the fire behavior models' ability to predict fire behavior given site specific inputs. One of the most successful ways the model has been improved has been through post-wildfire modeling (Brown 1972, Lawson 1972, Sneeuwjagt and Frandsen 1977, Andrews 1980, Brown 1982, Rothermel and Rinehart 1983, Bushey 1985, McAlpine and Xanthopoulos 1989, Marsden-Smedley and Catchpole 1995, Grabner et. al. 1997, Alexander 1998, Grabner et al. 2001, Arca et al. 2007). In this type of study, Behave is used to model fire behavior based on pre-fire conditions in an area that recently burned. Real-world fire behavior, documented during the wildfire, can then be compared to the prediction results of Behave and refinements to the fuel models incorporated, retested, and so on.

Fire behavior modeling conducted on this site includes a relatively high-level of detail and analysis which results in reasonably accurate representations of how wildfire may move through available fuels on and adjacent to the property. Fire behavior calculations are based on site-specific fuel characteristics supported by fire science research that analyzes heat transfer related to specific fire behavior. To objectively predict flame lengths, spread rates, and fireline intensities, this analysis incorporated predominant fuel characteristics, slope percentages, and representative fuel models observed on site. The BehavePlus fire behavior modeling system was used to analyze anticipated fire behavior in key areas within and adjacent to the proposed Project site. Predicting wildland fire behavior is not an exact science. As such, the movement of a fire will likely never be fully predictable, especially considering the variations in weather and the limits of weather forecasting. Nevertheless, practiced and experienced judgment, coupled with a validated fire behavior modeling system, results in useful and accurate fire prevention planning information. To be used effectively, the basic assumptions and limitations of BehavePlus must be understood.

- First, it must be realized that the fire model describes fire behavior only in the flaming front. The primary driving force in the predictive calculations is dead fuels less than one-quarter inch in diameter. These are the fine fuels that carry fire. Fuels greater than one inch have little effect while fuels greater than three inches have no effect on fire behavior.
- Second, the model bases calculations and descriptions on a wildfire spreading through surface fuels that are within six feet of the ground and contiguous to the ground. Surface fuels are often classified as grass, brush, litter, or slash.
- Third, the software assumes that weather and topography are uniform. However, because wildfires almost always burn under non-uniform conditions, length of projection period and choice of fuel model must be carefully considered to obtain useful predictions.

- Fourth, the BehavePlus fire behavior computer modeling system was not intended for determining sufficient fuel modification zone/defensible space widths. However, it does provide the average length of the flames, which is a key element for determining "defensible space" distances for minimizing structure ignition.

Although BehavePlus has some limitations, it can still provide valuable fire behavior predictions which can be used as a tool in the decision-making process. In order to make reliable estimates of fire behavior, one must understand the relationship of fuels to the fire environment and be able to recognize the variations in these fuels. Natural fuels are made up of the various components of vegetation, both live and dead, that occur on a site. The type and quantity will depend upon the soil, climate, geographic features, and the fire or other disturbance history of the site. The major fuel groups of grass, shrub, trees, and slash are defined by their constituent types and quantities of litter and duff layers, dead woody material, grasses and forbs, shrubs, regeneration, and trees. Fire behavior can be predicted largely by analyzing the characteristics of these fuels. Fire behavior is affected by seven principal fuel characteristics: fuel loading, size and shape, compactness, horizontal continuity, vertical arrangement, moisture content, and chemical properties.

2 Modeling Inputs

Dudek utilized the BehavePlus software package to analyze fire behavior potential for the proposed development site in the City of Beaumont, Riverside County, California. For this analysis, four pre- proposed Project scenarios were evaluated, including one average summer weather conditions (southwest of the proposed Project site and west of the Project site) and two extreme weather offshore wind condition (north and northeast of the proposed Project site). Additionally, scenarios were run for post-project conditions at each of the four locations during similar wind conditions. The proposed Project site currently is undeveloped with largely unmaintained vegetation throughout the site. It is generally flat with little change in elevation throughout the site and is vegetated with, non-native grasses, sage scrub, and dispersed large shrubs. With that said, fuels and terrain adjacent to the development area could produce flying embers that may affect the proposed Project, but defenses will be built into the structures to prevent ember penetration and to extinguish fires that may result from ember penetration. It is the fuels directly adjacent to and within fuel modification zones that could have the potential to affect the proposed Project's structures from a radiant and convective heat perspective as well as from direct flame impingement, however, the ignition resistant structures would be surrounded by irrigated landscape and hardscape areas. BehavePlus software requires site-specific variables for surface fire spread analysis, including fuel type, fuel moisture, wind speed, and slope data. The output variables used in this analysis include flame length (feet), rate of spread (feet/minute), fireline intensity (BTU/feet/second), and spotting distance (miles), crown fire flame length (feet), crown fire intensity (BTU/feet/second), crown fire spotting distance (miles). The following provides a description of the input variables used in processing the BehavePlus models for the proposed Project site. In addition, data sources are cited and any assumptions made during the modeling process are described.

2.1 Vegetation (Fuels)

The seven fuel characteristics help define the 13 standard fire behavior fuel models and the five custom fuel models developed for Southern California (Anderson 1982; Weise & Regelbrugge 1997). According to the model classifications, fuel models used in BehavePlus have been classified into four groups, based upon fuel loading (tons/acre), fuel height, and surface to volume ratio. Observation of the fuels in the field (on site) determines which

fuel models should be applied in BehavePlus. The following describes the distribution of fuel models among general vegetation types for the standard 13 fuel models and the custom Southern California fuel models:

- Grasses Fuel Models 1 through 3
- Brush Fuel Models 4 through 7, SCAL 14 through 18
- Timber Fuel Models 8 through 10
- Logging Slash Fuel Models 11 through 13

In addition, the aforementioned fuel characteristics were utilized in the development of 40 more fire behavior fuel models developed for use in BehavePlus modeling efforts (Scott & Burgan 2005). These new models attempt to improve the accuracy of the standard 13 fuel models outside of severe fire season conditions, and to allow for the simulation of fuel treatment prescriptions. The following describes the distribution of fuel models among general vegetation types for the new 40 fuel models:

- Grass Models GR1 through GR9
- Grass-shrub Models GS1 through GS4
- Shrub Models SH1 through SH9
- Timber-understory Models TU1 through TU5
- Timber litter Models TL1 through TL9
- Slash blowdown Models SB1 through SB4

To support the fire behavior modeling efforts conducted for the proposed, a Dudek Fire Protection Planner analyzed the different vegetation types observed on and adjacent to the site and they were subsequently classified into the aforementioned numeric fuel models. As is customary for this type of analysis, the terrain and fuels directly adjacent to the site and proposed fuel modification zones (FMZ) are used for determining flame lengths and fire spread.

Table 1. Existing Fuel Model Characteristics

Fuel Model Assignment	Vegetation Description	Location	Fuel Bed Depth (Feet) [1]
GR1	Short, sparse dry climate grass	Represents the annual grasslands on and off the proposed Project site	0.4
GR2	Low load dry climate grass	Represents the annual grasslands on and off the proposed Project site	1
GS1	Low load dry climate grass-shrub	Represents the annual grass and scrub on and off the proposed Project site	0.9 ft
GS2	Moderate load dry climate grass-shrub	Represents the annual grass and scrub on and off the proposed Project site	1-3 ft
SH2	Moderate load dry climate shrub	Represents the California sage scrub on and off the Project site	1 ft
SH5	High Load, Dry Climate Shrub	Represents the dense chapparal on and off the Project site	4 ft – 5 ft

Note:

[1] Listed fuel bed depths reflect the fuel models that best depict the vegetation in and around the Proposed Project site and not an exact measure of local vegetation (Anderson 1982; Scott & Burgan 2005).

Table 2. Post-development Fuel Model Characteristics

Fuel Model Assignment	Vegetation Description	Location	Fuel Bed Depth (Feet)[1]
FM8	Compact Litter	Onsite Zone 1 and 2 fuel modification	0.2 ft.
GR1	Low load dry climate grass	Landscaped area surrounding the developed footprint within Project boundary	1
GS2	Moderate load dry climate grass-shrub	Offsite grassland and shrubs adjacent to Project site	1-3 ft
SH2	Moderate load dry climate shrub	Offsite California sage scrub fuels adjacent to Project site	1 ft
SH5	High load, dry climate shrub	Offsite scrub and chapparal fuels adjacent to Project site	4-5 ft
NB	Non-burnable	Paved areas throughout the proposed Project site.	0 ft

Note:
1 Listed fuel bed depths reflect the fuel models that best depict the vegetation in and around the Proposed Project site and not an exact measure of local vegetation (Anderson 1982; Scott & Burgan 2005).

2.2 Topography

Topography influences fire risk by affecting fire spread rates. Typically, steep terrain results in faster fire spread up-slope and slower fire spread down-slope in the absence of wind. Flat terrain tends to have little effect on fire spread, resulting in fires that are driven by wind. The elevations on the Project site range from approximately 2,700 feet above mean sea level (amsl) in the northeastern corner of the Project site to approximately 2,300 feet amsl in the southwestern portion of the project site. . The topography of the surrounding open space to the southeast, south and southwest is varied, and slopes down to the west toward the SR-79. The land to the north of the project is relatively flat.

2.3 Weather Analysis

Historical weather data for the San Bernardino County region was utilized in determining appropriate fire behavior modeling inputs for the proposed Project area. Average, on-shore (50th weather percentile and extreme off-shore (97th percentile) weather conditions were derived from Remote Automated Weather Stations (RAWS) and utilized in the fire behavior modeling efforts conducted in support of this report. The Beaumont RAWS Station (RAWS ID 045617) was utilized to find average and extreme weather values for the proposed Project area. The station was closest as it is the closest at approximately 4 miles northwest of the proposed Project site and would adequately approximate proposed Project site weather conditions. Data from fire seasons dating back to 2005 and up through 2025 were included in the analysis.

RAWS fuel moisture and wind speed data were processed utilizing the Fire Family Plus software package to determine atypical (97th percentile) and typical (50th percentile) weather conditions. Data from the RAWS was evaluated from August 1 through December 31 for each year between 2005 and 2025 for 97th percentile weather conditions and from June 1 through September 30 for each year between 2005 and 2025 for 50th percentile weather conditions.

Following analysis in Fire Family Plus, fuel moisture information was incorporated into the Initial Fuel Moisture file used as an input in BehavePlus. Wind speed data resulting from the Fire Family Plus analysis was also determined. Initial wind direction and wind speed values for the five BehavePlus runs were manually entered during the data input phase. The input wind speed and direction are an average surface wind at 20 feet above the vegetation over the analysis area. Table 3 summarizes the wind and weather input variables used in the Fire BehavePlus modeling efforts.

Table 3. Wind and Weather Input Variables

Model Variable	Summer Weather (50th Percentile) On and Offshore Wind	Peak Weather (97th Percentile) Offshore Wind
Fuel Models	GR1, GR2, GS1, SH2	GR1, GR2, GS1, GS2, SH2, SH5
1 h fuel moisture	4%	1%
10 h fuel moisture	5%	2%
100 h fuel moisture	8%	5%
Live herbaceous moisture	35%	30%
Live woody moisture	70%	60%
20 ft. wind speed	16 mph (sustained winds)	30 mph (sustained winds); wind gusts of 50 mph
Wind Directions from north (degrees)	260	75
Wind adjustment factor	0.4	0.4
Slope	4-8%	8-10%

3 Fire Behavior Modeling Efforts

As mentioned, the BehavePlus fire behavior modeling software package was utilized in evaluating anticipated fire behavior adjacent to the proposed Project site. Three focused scenarios were completed for pre-Project existing fuels conditions, and two were completed for the post proposed Project conditions. The results of the modeling effort included anticipated values for surface fires flame length (feet), rate of spread (mph), fireline intensity (Btu/ft/s), and spotting distance (miles). The aforementioned fire behavior variables are an important component in understanding fire risk and fire agency response capabilities. Flame length, the length of the flame of a spreading surface fire within the flaming front, is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews, Bevins, and Seli 2008). Fireline intensity is a measure of heat output from the flaming front and also affects the potential for a surface fire to transition to a crown fire. Fire spread rate represents the speed at which the fire progresses through surface fuels and is another important variable in initial attack and fire suppression efforts (Rothermel and Rinehart 1983). Spotting distance is the distance a firebrand or ember can travel down wind and ignite receptive fuel beds. Three pre-Project and two post-Project fire modeling scenario locations were selected to better understand the different fire behavior that may be experienced on or adjacent to the site based on slope and fuel conditions; these fire scenarios are explained in more detail below:

Fire Scenario Locations and Descriptions:

Pre-Project Conditions On/Offsite Scenarios

- **Scenario 1.** Fire flaming front approaching the proposed Project site from the open space to the south with average onshore summer winds (16 mph) being fueled on and offsite by dry climate grass and some shrubs.
- **Scenario 2.** Fire flaming front approaching the proposed Project site from the open space to the east with average onshore summer winds (16 mph) as it burns through the same vegetation described in Scenario 1.

- **Scenario 3.** Fire flaming front approaching the proposed Project site from the open space to the north with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) being fueled offsite by dry climate grass and some shrubs, and onsite by grasslands and scrub brush.
- **Scenario 4.** Fire flaming front approaching the proposed Project site from the open space to the west with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) as it burns through dry climate grasslands and scrub brush off and on-site.

Post Project Conditions Onsite/Offsite Scenarios

- **Scenario 1.** Fire flaming front approaching the proposed Project site from the open space to the south with average onshore summer winds (16 mph) being fueled offsite by low load dry climate grass and burning through irrigated managed vegetation onsite.
- **Scenario 2.** Fire flaming front approaching the proposed Project site from the open space to the east with average onshore summer winds (16 mph) as it burns through the same vegetation described in Scenario 1.
- **Scenario 3.** Fire flaming front approaching the proposed Project site from the open space to the north with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) being fueled offsite by low load dry climate grass and burning through irrigated managed vegetation onsite.
- **Scenario 4.** Fire flaming front approaching the proposed Project site from the open space to the west with extreme Santa Ana wind conditions (30 mph sustained winds with 50 mph gusts) as it burns through moderate load dry climate scrub brush offsite and burning through irrigated and managed vegetation on-site.

4 Fire Behavior Modeling Results

The results presented in Tables 4 and 5 depict values based on inputs to the BehavePlus software and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

The proposed Project site maintains similar slope and vegetation types on and offsite. The fire behavior models have been run considering pre-Project and post-Project conditions. Under the summer weather conditions modeled in pre-Project Scenario 1, a fire burning uphill through the grasslands and chaparral vegetation would move at a high rate of speed (1.0 mph during sustained winds), produce moderate flame lengths (6.8 feet during sustained winds), and produce embers that could travel 0.3 miles during sustained winds. While the proposed Project would be within range of the embers being produced during this scenario, the Beaumont Heights development would include structures with ignition resistant construction methods and materials as well as an ember-resistant Zone 0 around all structures. The fire modeled in this area within Scenario 1 would produce similar results to a fire burning to the northwest of the Project site, with the same average summer weather conditions, in Scenario 2. Such a fire would burn through the grasslands and chaparral vegetation at a moderate rate of speed (1.0 mph during sustained winds), produce moderate flame lengths (6.8 feet during sustained winds), and produce embers that would travel 0.3 miles.

Under the extreme Santa Ana weather conditions modeled in pre-Project Scenario 3, a fire burning uphill through the grasslands and chaparral vegetation would move at a very high rate of speed (2.0 mph during sustained winds, 4.2 mph during gusts), produce very high flame lengths (14.6 feet during sustained winds, 20.5 mph during gusts), and produce embers that could travel 0.8 miles during sustained winds. While the proposed Project would be within range of the embers being produced during this scenario, the Beaumont Heights development would include structures with ignition resistant construction methods and materials as well as an ember-resistant Zone 0 around all structures. The fire modeled in this area within Scenario 3 can be compared to a fire occurring to the east of the Project, under the same extreme Santa Ana weather conditions modeled in Scenario 4. Such a fire would burn through the grasslands and chaparral vegetation at a very high rate of speed (3.7 mph during sustained winds, 6.8 mph during gusts), produce very high flame lengths (34.0 feet during sustained winds, 44.8 feet during gusts), and produce embers that would travel 1.4 miles.

If any of the fires modeled in pre-Project Scenarios 1 or 2 were to spread onto the proposed Project site following development of the Project, the resulting fire would be described by post-proposed Project Scenarios 1 and 2. Post-proposed Project Scenario 1 describes a fire igniting to the southwest of the Project burning onsite during Project conditions and the adjacent offsite fuels during average summer weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In onsite fuel modification zone areas that have been irrigated, mowed and maintained, there would be low flame lengths (1.5 feet during sustained winds), a low rate of spread (0.0 mph during sustained winds) and embers could travel 0.1 miles during sustained winds. Offsite areas adjacent to the Project site that have not been maintained would continue to produce high flame lengths (6.5 feet during sustained winds) and move at a moderate rate of speed (0.2 mph during sustained winds) and produce embers that could travel 0.3 miles under sustained winds.

Post-proposed Project Scenario 2 describes a fire igniting to the west of the Project site burning onsite during Project conditions and the adjacent offsite fuels during average summer weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In fuel modification zones and areas that have been irrigated, mowed and maintained, the fire behavior would remain the same as in Scenario 1. Offsite areas adjacent to the Project site that have not been maintained would continue to produce moderate flame lengths (6.5 feet during sustained winds) and move at a low rate of speed (0.2 mph during sustained winds) and produce embers that could travel 0.3 miles under sustained winds.

If any of the fires modeled in pre-Project Scenarios 3 or 4 were to spread onto the proposed Project site following development of the Project, the resulting fire would be described by post-proposed Project Scenarios 3 and 4. Post-proposed Project Scenario 3 describes a fire igniting to the north of the Project burning onsite during Project conditions and the adjacent offsite fuels during extreme Santa Ana weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In onsite fuel modification zone areas that have been irrigated, mowed and maintained, there would be low flame lengths (2.8 feet during sustained winds, 3.0 feet during gusts), a low rate of spread (0.1 mph during sustained winds, 0.2 mph during gusts) and embers could travel 0.3 miles during sustained winds. Offsite areas adjacent to the Project site that have not been maintained would continue to produce moderate flame lengths (14.6 feet during sustained winds, 20.5 feet during gusts) and move at a moderate rate of speed (2.0 mph during sustained winds 4.2 mph during gusts) and produce embers that could travel 0.8 miles under sustained winds.

Post-proposed Project Scenario 4 describes a fire igniting to the east of the Project site burning onsite during Project conditions and the adjacent offsite fuels during extreme Santa Ana weather conditions. During such an event, fire behavior would vary according to the different vegetation present onsite. In fuel modification zones and areas that

have been irrigated, mowed and maintained, there would be low flame lengths (2.8 feet during sustained winds, 3.0 feet during gusts), a low rate of spread (0.1 mph during sustained winds, 0.2 mph during gusts) and embers could travel 0.1 miles during sustained winds. Offsite areas adjacent to the Project site that have not been maintained would continue to produce high flame lengths (34.0 feet during sustained winds, 44.8 feet during gusts) and move at a moderate rate of speed (3.7 mph during sustained winds, 6.8 mph during gusts) and produce embers that could travel 0.4 miles under sustained winds.

Post-Project conditions in the onsite Project areas would result in a reduction of up to 31 feet in flame lengths and up to 3.5 mph in spread rates. As a result of the proposed fuel modification, the fire hazard presented by the site would be reduced compared to its current state. This means reduced fire risk for nearby residents. Further, the anticipated surface fire would not be anticipated to transition to any proposed structures due to their planned ignition resistance and the proposed integration of the ember-resistant Zone 0. Flame lengths in offsite fuels will remain similar in pre and post Project conditions, producing maximum flame lengths of approximately 45 feet during extreme weather events with high wind gusts. The proposed Project structures will be at a minimum of 200 feet away from the nearest offsite fuels.

Table 4. RAWS BehavePlus Fire Behavior Model Results – Existing Conditions

Fire Scenarios	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/ second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Scenario 1 (Pre-Project): 16% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind south of the site				
Short, sparse grass (GR1)	2.2	33	0.3	0.1
Low load grass (GR2)	6.8	361	1.0	0.3
Low load grass-shrub (GS1)	5.0	188	0.4	0.2
Moderate load shrub (SH2)	6.5	332	0.2	0.3
Scenario 2 (Pre-Project): 3% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind west of the site				
Short, sparse grass (GR1)	2.2	33	0.3	0.1
Low load grass (GR2)	6.8	362	1.0	0.3
Low load grass-shrub (GS1)	5.0	189	0.4	0.2
Moderate load shrub (SH2)	6.5	333	0.2	0.3
Scenario 3 (Pre-Project): 10% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts north of the site (2)				
Short, sparse grass (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Low load grass (GR2)	14.7 (18.0)	1,961 (3,037)	4.0 (6.2)	0.8 (1.3)
Low load grass-shrub (GS2)	14.6 (20.5)	1,934 (4,042)	2.0 (4.2)	0.8 (1.4)
Scenario 4 (Pre-Project): 18% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts east of the site (2)				
Low load grass (GR2)	14.7 (18.0)	1,966 (3,037)	4.0 (6.2)	0.8 (1.3)
Low load grass-shrub (GS1)	10.1 (14.0)	869 (1,763)	1.5 (3.0)	0.6 (1.1)
Moderate load shrub (SH2)	11.6 (16.0)	1,167 (2,338)	0.5 (1.0)	0.7 (1.2)
High load shrub (SH5)	34.0 (44.8)	12,111 (22,049)	3.7 (6.8)	1.4 (2.4)

Note:

1 Wind-driven surface fire.

2 Values in parentheses represent the respective output in the presence of 50 mph gusts.

Table 5. RAWS BehavePlus Fire Behavior Model Results – Post Proposed Project Conditions

Fire Scenarios	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/ second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Scenario 1 (post-Project): 16% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind south of the site				
Irrigated Area (FM8)	1.5	13	0.0	0.1
Landscaped Area (GR1)	2.2	33	0.3	0.1
Offsite Project Adjacent Fuel (SH2)	6.5	332	0.2	0.3
Non-burnable	N/A	N/A	N/A	N/A
Scenario 2 (post-Project): 3% slope; Average summer winds (50th percentile onshore), sustained 16 mph wind west of the site				
Irrigated Landscapes (FM8)	1.5	13	0.0	0.1
Landscaped Area (GR1)	2.2	33	0.3	0.1
Offsite Project Adjacent Fuel (SH2)	6.5	333	0.2	0.3
Non-burnable	N/A	N/A	N/A	N/A
Scenario 3 (post-Project): 10% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts north of the site (2)				
Irrigated Landscapes (FM8)	2.8 (3.0)	55 (63)	0.1 (0.2)	0.3 (0.4)
Landscaped Area (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Offsite Project Adjacent Fuel (GS2)	14.6 (20.5)	1,934 (4,042)	2.0 (4.2)	0.8 (1.4)
Non-burnable	N/A	N/A	N/A	N/A
Scenario 4 (post-Project): 18% slope; Extreme Santa Ana winds (97th percentile onshore), sustained 30 mph wind 50 mph gusts east of the site (2)				
Irrigated Landscapes (FM8)	2.8 (3.0)	55 (63)	0.1 (0.2)	0.1
Landscaped Area (GR1)	4.0 (4.0)	115 (115)	0.7 (0.7)	0.3 (0.5)
Offsite Project Adjacent Fuel (SH5)	34.0 (44.8)	12,111 (22,049)	3.7 (6.8)	0.4
Non-burnable	N/A	N/A	N/A	N/A

Note:
1 Wind-driven surface fire.
2 Values in parentheses represent the respective output in the presence of 50 mph gusts.

The following describes the fire behavior variables (Heisch and Andrews 2010) as presented in Tables 4 and 5:

Surface Fire:

- **Flame Length (feet):** The flame length of a spreading surface fire within the flaming front is measured from midway in the active flaming combustion zone to the average tip of the flames.
- **Fireline Intensity (Btu/ft/s):** Fireline intensity is the heat energy release per unit time from a one-foot wide section of the fuel bed extending from the front to the rear of the flaming zone. Fireline intensity is a function of rate of spread and heat per unit area, and is directly related to flame length. Fireline intensity and the flame length are related to the heat felt by a person standing next to the flames.

- **Surface Rate of Spread (mph):** Surface rate of spread is the "speed" the fire travels through the surface fuels. Surface fuels include the litter, grass, brush and other dead and live vegetation within about 6 feet of the ground.

The information in Table 6 presents an interpretation of the outputs for five fire behavior variables as related to fire suppression efforts. The results of fire behavior modeling efforts are presented in Tables 4 and 5. Identification of modeling run locations is presented graphically in Figure 6 of the FPP.

Table 6. Fire Suppression Interpretation

Flame Length (ft)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 to 8 feet	100-500 BTU/ft/s	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 to 11 feet	500-1000 BTU/ft/s	Fires may present serious control problems – torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

Appendix D

Ignition-Resistant Construction Requirements

Summary of Special Building Construction Regulations

Sourced From Chapter 5 of the 2025 California Wildland-Urban Interface Code

Chapter 5 of the California Wildland-Urban Interface Code (CWUIC) provides regulations that establish minimum standards for the location, design, and construction of buildings and structures based on construction within a State Responsibility Area Fire Hazard Severity Zone, a Local Responsibility Very High Fire Hazard Severity Zone, or a designated Wildland-Urban Interface (WUI) Area.

The construction provisions of Chapter 5 are intended to supplement the requirements of the California Building Code (CBC) and the California Residential Code (CRC) and address mitigation of the unique hazards posed to buildings by wildfire and to reduce the hazards of building fires spreading to wildland fuels. This is accomplished by requiring ignition-resistant construction materials. The requirements for Materials and Construction Methods for Exterior Wildfire Exposure located in Chapter 7A of the 2022 CBC and Section R337 of the 2022 CRC have been relocated to Chapter 5 of the 2025 CWUIC.

This document contains a summary of the requirements for ignition-resistant construction materials and methods for exterior wildfire exposure found in Chapter 5 of the CWUIC that are in effect as of the date of the report to which this summary is attached or appended.

1. Roofs shall have a roof assembly that complies with a Class A fire classification when tested in accordance with ASTM E108 or UL 790.
2. Where the roof covering is installed over a combustible deck and the roofing profile creates an airspace under the roof covering, the installation shall comply with the following:
   - A 72-pound cap sheet complying with ASTM D3909 shall be installed over the roof deck.
   - Bird stops shall be used at the eaves where the profile fits, to prevent the entry of debris at the eave.
   - Hip and ridge caps shall be mudded in to prevent intrusion of fire or embers.
3. Where provided, valley flashings shall be not less than 0.019-inch 26-gauge galvanized, corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of 72-pound mineral-surfaced, non-perforated cap sheet complying with ASTM D3909 running the full length of the valley.
4. The exposed underside of enclosed roof eaves and soffits shall be protected on the exposed underside by one or more of the following:
   - Non-combustible materials.
   - Ignition-resistant building materials.
   - Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side, as tested in accordance with ASTM E119 or UL 263.
   - 2-inch nominal dimension lumber.
   - 1-inch nominal fire-retardant-treated lumber or 3/4-inch nominal fire-retardant-treated plywood, identified for exterior use and complying with Section 2303.2 of the CBC.
   - Boxed-in roof eave soffit assemblies with an underside that meets the performance criteria in Section 504.7.2 of the CWUIC when tested in accordance with the test procedures set forth in ASTM E2957.
   - Boxed-in roof eave soffit assemblies with an underside that meets the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3.

- Fascias are required and shall be ignition-resistant building materials, fire-retardant-treated wood labeled for exterior use and complying with Section 2303.2 of the CBC, materials approved for not less than 1-hour fire-resistance-rated construction, or 2-inch nominal dimension lumber.

5. The exposed roof deck on the underside of unenclosed roof eaves shall consist of one or more of the following:
   - Non-combustible material.
   - Ignition-resistant building material.
   - Fire-retardant-treated wood labeled for exterior use and complying with Section 2303.2 of the CBC.
   - Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side, as tested in accordance with ASTM E119 or UL 263.
   - 2-inch nominal dimension lumber.
   - One layer of 5/8-inch Type X gypsum sheathing applied behind an exterior covering on the underside of the roof deck.
   - The exterior portion of a 1-hour fire-resistance-rated exterior assembly, as tested in accordance with ASTM E119 or UL 263, applied to the underside of the roof deck designed for exterior fire exposure.
   - Facias, if provided, shall be of fire-retardant-treated wood labeled for exterior use and complying with Section 2303.2 of the CBC, ignition-resistant building materials, materials approved for not less than 1-hour fire-resistance-rated construction, or 2-inch nominal dimension lumber.
6. Gutters and downspouts shall be constructed of non-combustible material. Gutters shall be provided with an approved means to prevent the accumulation of leaves and debris in the gutter.
7. Exterior walls of buildings or structures shall be constructed with one or more of the following methods, unless they are covered with an exterior wall covering complying with Sections 504.5.2 and 504.5.2.1 of the CWUIC:
   - 1-hour fire-resistance-rated construction on the exterior side.
   - Non-combustible materials.
   - Heavy timber. Assembly of sawn lumber or glue-laminated wood with the smallest minimum nominal dimension of 4 inches.
   - Log wall construction.
   - Wall assemblies that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance shown in Section 504.9.3 of the CWUIC.
   - Wall assemblies that meet the performance criteria in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in SFM Standard 12-7A-1.
   - Wall assemblies suitable for exterior fire exposure containing one layer of 5/8-inch Type X gypsum sheathing applied behind the exterior wall covering or cladding on the exterior side of the framing.
   - Wall assemblies suitable for exterior fire exposure with a 1-hour fire-resistance rating, rated from the exterior side, as tested in accordance with ASTM E119 or UL 263.
   - Fire-retardant-treated wood labeled for exterior use and complying with Section 2303.2 of the CBC.
8. A minimum of 6 inches of metal flashing or non-combustible material applied vertically on the exterior of the wall shall be installed at the ground, decking, and roof intersections.
9. Where provided, exterior wall coverings shall extend from the top of the foundation to the roof and terminate at 2-inch nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure.

10. Exterior wall coverings shall comply with one or more of the following requirements:
    - Non-combustible material.
    - Ignition-resistant building material labeled for exterior use.
    - Fire-retardant-treated wood labeled for exterior use and complying with the requirements of Section 2303.2 of the CBC.
    - Fire-retardant-treated wood shingles and shakes which have been qualified in accordance with Section 1505.6 of the CBC for use as "Class B" roof covering shall be an acceptable alternative wall covering material where installed over solid sheathing.

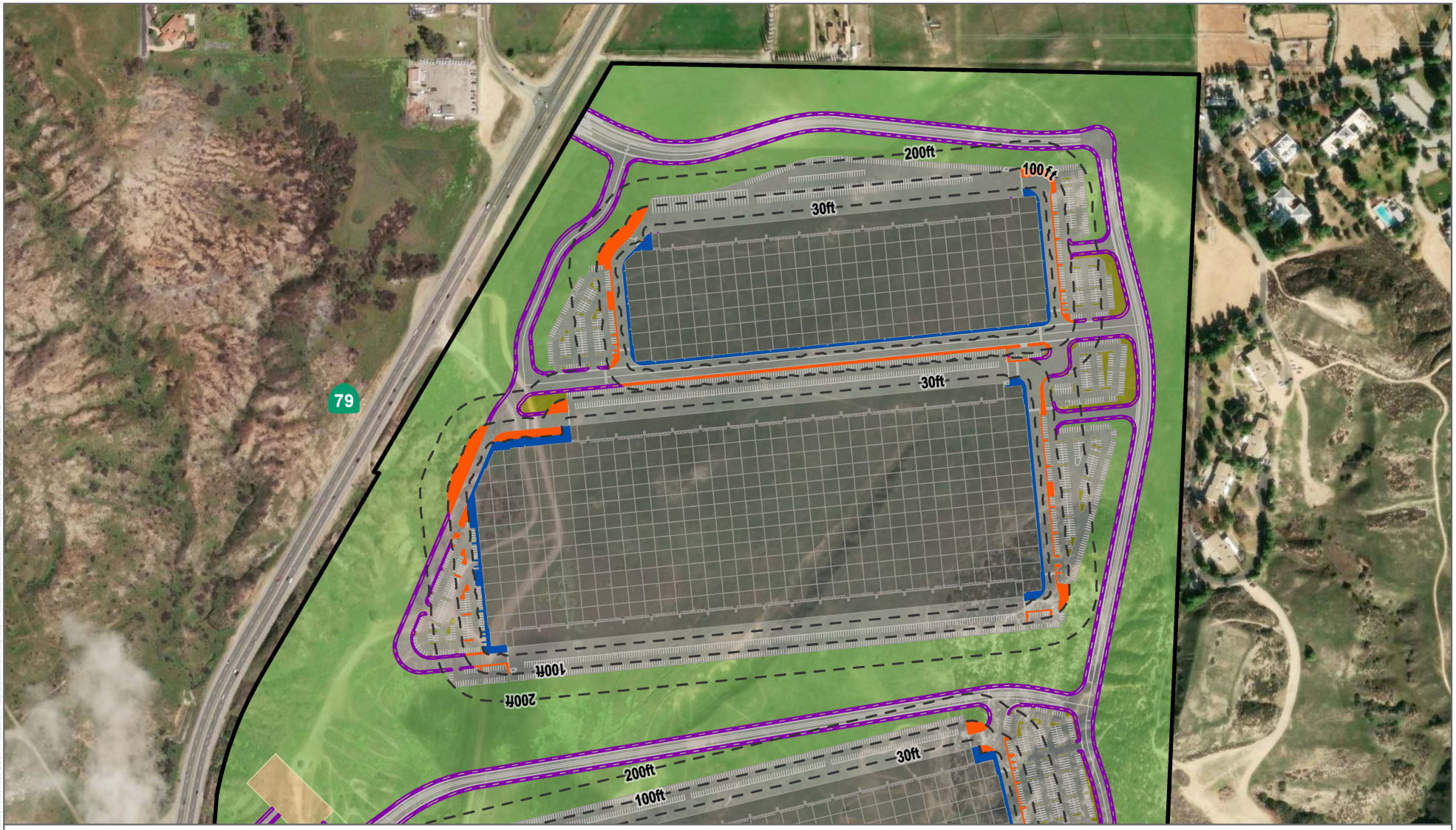
    Exception: Exterior wall coverings which are a component of an approved wall assembly complying with Section 504.5 of the CWUIC.
11. Roof vents, dormer vents, gable vents, foundation ventilation openings, ventilation openings in vertical walls, or other similar ventilation openings shall be louvered and covered with 1/16-inch non-combustible, corrosion-resistant metal mesh or other approved material that offers equivalent protection.
12. Attic or foundation ventilation louvers or ventilation openings in vertical walls shall not exceed 144 square inches per opening and shall be covered with 1/16-inch non-combustible, corrosion-resistant metal mesh or other approved material that offers equivalent protection. Ventilation louvers and openings may be incorporated as part of access assemblies.
13. Attic ventilation openings or ventilation louvers are prohibited in soffits, in eave overhangs, between rafters at eaves, or in other overhanging areas.
14. All materials used for fencing and gate assemblies attached to or within five feet of a structure shall be non-combustible material or pressure-treated exterior fire-retardant wood.
15. Projections and unenclosed accessory structures attached to buildings with habitable spaces, except for decks, shall be constructed of one of the following:
    - Heavy timber construction.
    - Non-combustible materials.
    - Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the CBC.
    - Ignition-resistant building materials in accordance with Section 503.2 of the CWUIC.
    - Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side, as tested in accordance with ASTM E119 or UL 263.
    - One layer of 5/8-inch Type X gypsum sheathing applied behind the exterior covering on the underside of the ceiling.
    - The exterior portion of a 1-hour fire-resistance-rated exterior assembly, as tested in accordance with ASTM E119 or UL 263, applied to the underside of the ceiling assembly.
    - The underside of a floor projection assembly that meets the performance criteria in Section 504.7.2 of the CWUIC when tested in accordance with the test procedures set forth in ASTM E2957.
    - The underside of a floor projection assembly that meets the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3.
    - The underside of projections shall be enclosed to grade in accordance with the requirements of this chapter or the underside of the exposed underfloor shall be protected in accordance with Section 504.7.1 of the CWUIC.

16. The walking surface material of decks, porches, balconies, and stairs shall be constructed with any of the following materials:
    - Material that complies with the performance requirements of Section 504.7.3.3 of the CWUIC when tested in accordance with ASTM E2632 and ASTM E2726.
    - Ignition-resistant building material that complies with the performance requirements of Section 503.2.4 of the CWUIC.
    - Material that complies with the performance requirements of both SFM Standard 12-7A-4 and Section 503.2.4 of the CWUIC.
    - Fire-retardant-treated wood labeled for exterior use and complying with Section 2303.2 of the CBC.
    - Non-combustible material.
    - Any material that complies with the performance requirements of SFM Standard 12-7A-4A and any attached exterior wall covering that is non-combustible or ignition-resistant building materials.
    - Any material that complies with the performance requirements of Section 504.7.3.4 of the CWUIC when tested in accordance with ASTM E2632 and any attached exterior wall covering that is non-combustible or ignition-resistant building materials.
    - Wall material shall be permitted to be of any material that otherwise complies with this chapter when the decking surface material complies with the performance requirements of ASTM E84 or UL 723 with a Class B flame spread index.
17. Exterior windows, window walls and glazed doors, windows within exterior doors, and skylights shall be constructed of any of the following:
    - Multi-layered glazed panels with at least one pane of tempered glass complying with Section 2406 of the CBC.
    - Glass block.
    - Glazing with a fire-protection rating of not less than 20 minutes when tested according to NFPA 257 or UL 9. Such glazing is exempt from the hose stream test.
    - Glazing meeting the performance requirements of SFM Standard 12-7A-2.
18. Exterior doors shall be constructed in accordance with any of the following:
    - Non-combustible construction.
    - Solid-core wood not less than 1-3/4 inches thick.
    - The exterior door shall be constructed of solid core wood that complies with the following requirements:
        - Stiles and rails shall not be less than 1-3/8 inches thick.
        - Raised panels shall not be less than 1-1/4 inches thick, except for the exterior perimeter of the raised panel that shall be permitted to taper to a tongue not less than 3/8 inch thick.
    - Have a fire protection rating of not less than 20 minutes when tested according to NFPA 252, UL 10B, or UL 10C.
    - The exterior surface or cladding meeting the performance requirements of Section 504.9.3 of the CWUIC when tested in accordance with ASTM E2707.
    - The exterior surface or cladding shall be tested to meet the performance requirements of SFM Standard 12-7A-1.
    - Windows within doors and glazed doors shall be in accordance with Section 504.8 of the CWUIC.

19. Exterior garage doors shall resist the intrusion of embers by preventing gaps between doors and door openings, at the bottom, sides and tops of doors, from exceeding 1/8 inch. Gaps between doors and door openings shall be controlled by one or more of the following methods:
    - Weather-stripping products constructed of materials that comply with both of the following:
        - The tensile strength of the material shall be tested in accordance with ASTM D638 before and after exposure to ASTM G155 for a period of 2,000 hours, and the maximum allowable difference in tensile strength values between exposed and nonexposed samples shall not exceed 10 percent.
        - When tested to UL 94, the materials shall have a flammability rating of V-2 or better.
    - Door overlaps onto jambs and headers.
    - Garage door jambs and headers covered with metal flashing.
20. Automatic garage door openers for vehicle doors serving a residential building shall be equipped with a battery backup function.
21. Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical surface, shall be in accordance with Section 504.10.1 or Section 504.10.2 of the CWUIC to resist building ignition from the intrusion of burning embers and flame through the ventilation openings. Ventilation openings shall be fully covered with Wildfire Flame and Ember Resistant vents approved and listed by the California State Fire Marshal, or WUI vents, tested in accordance with ASTM E2886.
22. Vents that are installed on a sloped roof, such as dormer vents, shall comply with all of the following:
    - Vents shall be covered with a mesh where the dimensions of the mesh therein shall be a minimum of 1/16 inch and shall not exceed 1/8 inch in diameter.
    - The vent and mesh material shall be non-combustible.
    - The vent and mesh material shall be corrosion resistant.
23. Gable-end and dormer vents shall be located not less than 10 feet from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.
24. Accessory buildings and miscellaneous structures that have the potential to pose a significant exterior fire exposure hazard during wildfires shall be constructed to conform to the ignition-resistance requirements of Section 504.11 of the CWUIC.
25. Miscellaneous structures that require a permit, and accessory buildings of any size, when separated from a building that has residential, commercial, educational, institutional, or similar occupancy type use on the same lot by a distance of less than 3 feet, shall be constructed of non-combustible materials or ignition-resistant building materials as described in Section 503.2.4 of the CWUIC.
26. Accessory buildings that are greater than 120 square feet in size and separated from a building that has residential, commercial, educational, institutional, or similar occupancy type use on the same lot by a distance of 3 feet or more but less than 50 feet shall be constructed of non-combustible materials or of ignition-resistant building materials as described in Section 503.2.4 of the CWUIC.
27. Where required by the code official, miscellaneous structures that require a permit and are separated from a building that has residential, commercial, educational, institutional, or similar occupancy type use on the same lot by a distance of 3 feet or more but less than 50 feet shall be constructed of non-combustible materials or of ignition-resistant building materials as described in Section 503.2.4 of the CWUIC.

28. Roof assemblies and roof coverings of accessory buildings required to be constructed entirely of non-combustible materials or of ignition-resistant building materials shall comply with Sections 504.2 and 504.2.1 of the CWUIC. Roofs shall have a roofing assembly installed in accordance with its listing and the manufacturer's installation instructions. Roof assemblies in State Responsibility Area Fire Hazard Severity Zones shall comply with a Class A fire classification when tested in accordance with ASTM E108 or UL 790.
29. Paper-faced insulation is prohibited in attics or ventilated spaces.
30. All chimneys attached to any appliance or fireplace that burns solid fuel shall be equipped with an approved spark arrester in accordance with the requirements of the CBC.
31. Automatic interior fire sprinklers shall be installed in accordance with the CFC and National Fire Protection Association (NFPA) requirements.

Appendix E
Project Fuel Modification Plan



Project Boundary

Project Land Use

Building Footprints

Open Space

PAD

Parking Median

Roadway/Parking

Distiance from Structure

Fuel Modification Zones

Zone A (0-30ft)

Zone B (31-100ft)

Roadside Zone (10ft)

SOURCE: ESRI World Imagery 2025

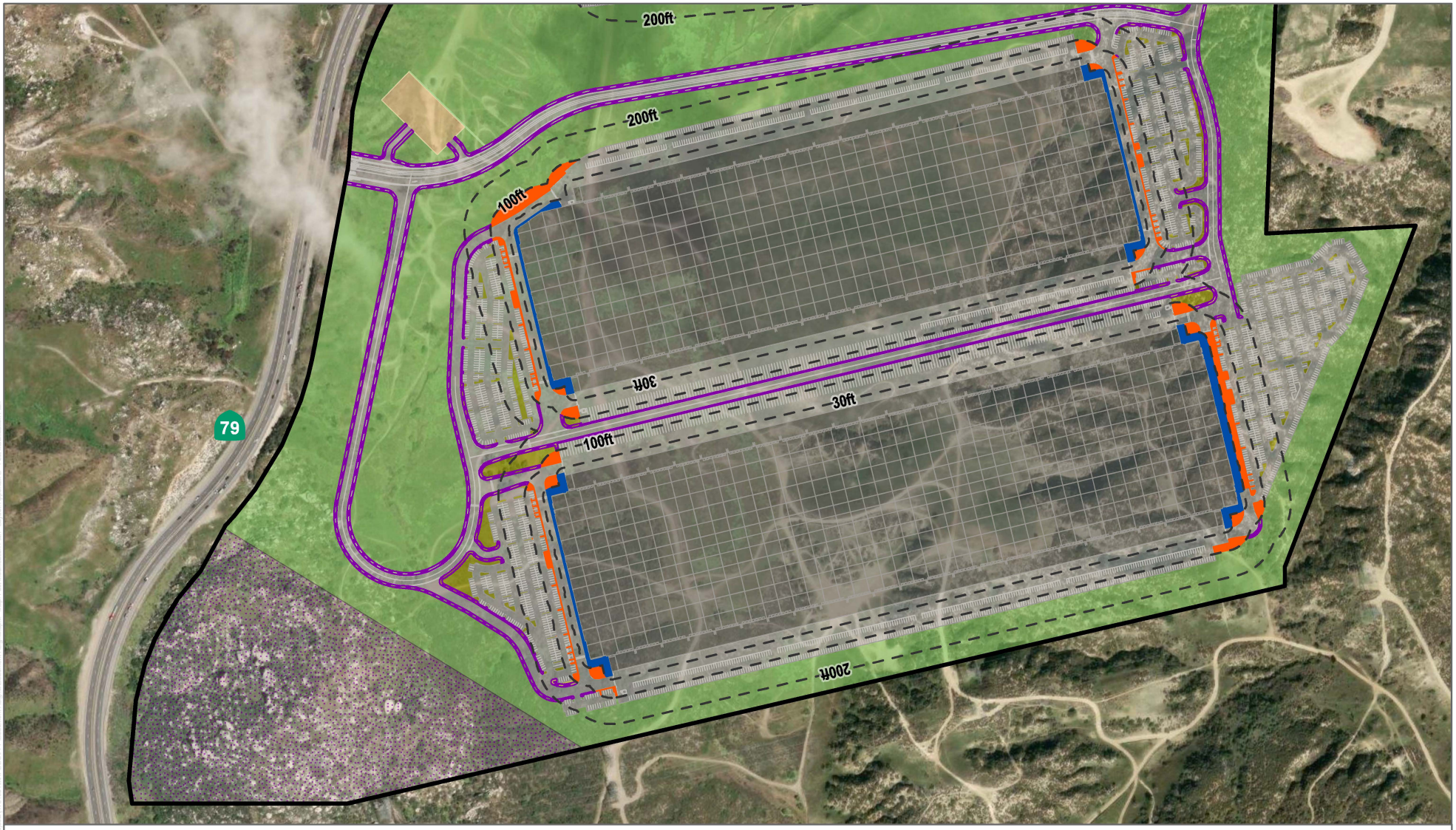
DUDEK

0 260 520 Feet

APPENDIX E

Fuel Modification Plan

Beaumont Heights Fire Protection Plan



Project Boundary

Project Land Use

- Building Footprints
- Detention Basin
- Open Space
- PAD
- Parking Median
- Roadway/Parking
- Undeveloped Land - Disturbed Open Space

Distiance from Structure

Fuel Modification Zones

- Zone A (0-30ft)
- Zone B (31-100ft)
- Roadside Zone (10ft)

SOURCE: ESRI World Imagery 2025

DUDEK

0 270 540 Feet

APPENDIX E

Fuel Modification Plan

Beaumont Heights Fire Protection Plan

Appendix F
Prohibited Plant List

Botanical Name	Common Name	Comment*
Trees		
Abies species	Fir	F
Agonis juniperina	Juniper Myrtle	F
Casuarina cunninghamiana	River She-Oak	F
Chamaecyparis species (numerous)	False Cypress	F
Cryptomeria japonica	Japanese Cryptomeria	F
Cupressocyparis leylandii	Leyland Cypress	F
Cupressus species *(C. fobesii, C. glabra, C. sempervirens,)*	Cypress (Tecate, Arizona, Italian, others)	F
Eucalyptus species (numerous)	Eucalyptus	F, I
Juniperus species (numerous)	Juniper	F
Lithocarpus densiflorus	Tan Oak	F
Melaleuca species *(M. linariifolia, M. nesophila, M. quinquenervia)*	Melaleuca (Flaxleaf, Pink, Cajeput Tree)	F, I
Picea (numerous)	Spruce	F
Palm species (numerous)	Palm	F, I
Pinus species *(P. brutia, P. canariensis, P. b. eldarica, P. halepensis, P. pinea, P. radiata, numerous others)*	Pine (Calabrian, Canary Island, Mondell, Aleppo, Italian Stone, Monterey)	F
Platycladus orientalis	Oriental arborvitae	F
Pseudotsuga menziesii	Douglas Fir	F
Tamarix species *(T. africana, T. aphylla, T. chinensis, T. parviflora)*	Tamarix (Tamarisk, Athel Tree, Salt Cedar, Tamarisk)	F, I
Taxodium species *(T. ascendens, T. distichum, T. mucronatum)*	Cypress (Pond, Bald, Monarch, Montezuma)	F
Taxus species *(T. baccata, T. brevifolia, T. cuspidata)*	Yew (English, Western, Japanese)	F
Thuja species *(T. occidentalis, T. plicata)*	Arborvitae/Red Cedar	F
Groundcovers, Shrubs & Vines		
Acacia species	Acacia	F, I
Adenostoma fasciculatum	Chamise	F
Adenostoma sparsifolium	Red Shanks	F
Agropyron repens	Quackgrass	F, I
Anthemis cotula	Mayweed	F, I
Arctostaphylos species	Manzanita	F
Arundo donax	Giant Reed	F, I
Artemisia species *(A. abrotanium, A. absinthium, A. californica, A. caucasica, A. dracunculus, A. tridentata, A. pynocephala)*	Sagebrush (Southernwood, Wormwood, California, Silver, True tarragon, Big, Sandhill)	F
Atriplex species (numerous)	Saltbush	F, I
Avena fatua	Wild Oat	F
Baccharis pilularis	Coyote Bush	F
Bambusa species	Bamboo	F, I
Bougainvillea species	Bougainvillea	F, I
Brassica species *(B. campestris, B. nigra, B. rapa)*	Mustard (Field, Black, Yellow)	F, I

Botanical Name	Common Name	Comment*
Bromus rubens	Foxtail, Red brome	F, I
Castanopsis chrysophylla	Giant Chinquapin	F
Cardaria draba	Hoary Cress	I
Cirsium vulgare	Wild Artichoke	F,I
Conyza bonariensis	Horseweed	F
Coprosma pumila	Prostrate Coprosma	F
Cortaderia selloana	Pampas Grass	F, I
Cytisus scoparius	Scotch Broom	F, I
Eriogonum species *(E. fasciculatum)*	Buckwheat (California)	F
Fremontodendron species	Flannel Bush	F
Heterotheca grandiflora	Telegraph Plant	F
Hordeum leporinum	Wild barley	F, I
Juniperus species	Juniper	F
Lactuca serriola	Prickly Lettuce	I
Larrea tridentata	Creosote bush	F
Lolium multiflorum	Ryegrass	F, I
Lonicera japonica	Japanese Honeysuckle	F
Mimulus aurantiacus	Sticky Monkeyflower	F
Miscanthus species	Eulalie Grass	F
Muhlenbergia species	Deer Grass	F
Nicotiana species *(N. bigelovii, N. glauca)*	Tobacco (Indian, Tree)	F, I
Pennisetum setaceum	Fountain Grass	F, I
Perovskia atroplicifolia	Russian Sage	F
Phoradendron species	Mistletoe	F
Pickeringia montana	Chaparral Pea	F
Rhus (R. diversiloba, R. laurina, R. lentii)	Sumac (Poison oak, Laurel, Pink Flowering)	F
Ricinus communis	Castor Bean	F, I
Rhus Lentii	Pink Flowering Sumac	F
Salvia species (numerous)	Sage	F, I
Salsola australis	Russian Thistle	F, I
Solanum Xantii	Purple Nightshade (toxic)	I
Silybum marianum	Milk Thistle	F, I
Thuja species	Arborvitae	F
Urtica urens	Burning Nettle	F

*F = flammable, I = Invasive

Notes:

1. Plants on this list that are considered invasive are a partial list of commonly found plants. There are many other plants considered invasive that should not be planted in a fuel modification zone and they can be found on The California Invasive Plant Council's Website www.cal-ipc.org/ip/inventory/index.php. Other plants not considered invasive at this time may be determined to be invasive after further study.
2. For the purpose of using this list as a guide in selecting plant material, it is stipulated that all plant material will burn under various conditions.
3. The absence of a particular plant, shrub, groundcover, or tree, from this list does not necessarily mean it is fire resistive.
4. All vegetation used in Fuel Modification Zones and elsewhere in this development shall be subject to approval of the Fire Code Official.
5. Landscape architects may submit proposals for use of certain vegetation on a project specific basis. They shall also submit justifications as to the fire resistivity of the proposed vegetation.

DRAFT

Wildfire Evacuation Study

Beaumont Heights Project

JANUARY 2026

Prepared for:

ORBIS REAL ESTATE PARTNERS

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Table of Contents

SECTION **PAGE NO.**

Acronyms and Abbreviations iii

Executive Summary v

1 Introduction 1
- 1.1 Project Description 1
- 1.2 Applicable Regulations, Standards, and Planning Tools 2
  - 1.2.1 Federal 2
  - 1.2.2 State 7
  - 1.2.3 Regional and Local 9

2 Local and Regional Evacuation Planning 13
- 2.1 City and County Emergency Operations Procedures 13
- 2.2 Evacuation Objectives 15
- 2.3 Evacuation Coordination Process 16
- 2.4 Evacuation Response Operations 17
  - 2.4.1 Emergency Communications 18
  - 2.4.2 Evacuation Points and Shelters 19
  - 2.4.3 Pet Evacuations 19
  - 2.4.4 Shelter-in-Place 20

3 Beaumont Heights Project Evacuation Procedures 21
- 3.1 Beaumont Heights Industrial Project Evacuation 21
  - 3.1.1 Evacuation of Special Populations and Individuals with Access and Functional Needs 22
  - 3.1.2 Animal Evacuations 23
  - 3.1.3 Re-entry Procedures 23
- 3.2 Civilian and Firefighter Evacuation Contingency 23
  - 3.2.1 Safety Zones 24
  - 3.2.2 Temporary Firefighter Refuge Areas 25
- 3.3 PACE Planning for Evacuation 26

4 Evacuation Road Network 29
- 4.1 CEQA Significance Standards 29
- 4.2 Wildfire Evacuation 29
- 4.3 Evacuation Modeling 34
  - 4.3.1 Evacuation Modeling Methodology, Assumptions, and Scenarios 34
  - 4.3.2 Modeling Results 43
- 4.4 Potential for Project Evacuation Impacts 44

5 Wildfire/Evacuation Awareness 47
6 Recommended Mitigation 49
7 Limitations 51
8 References 55

TABLES

1 PACE Evacuation Plan for the Beaumont Heights Project 27
2 Comparison of Studied Project Details to September 2025 Site Plan 36
3 Project and Surrounding Communities Evacuating Vehicles 37
4 Evacuation Routes 39
5 Evacuation Modeling Scenarios and Evacuation Time Summary 44

FIGURES

1 Project Vicinity 3
2 Project Site Plan 5
3 Incident Command System Functions 14
4 Evacuation Routes 39
5 Evacuation Areas 41

APPENDICES

A Local and State Preparedness Resources
B Federal Preparedness Resources
C Evacuation Modeling

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AFN	Access and Functional Needs
BPD	City of Beaumont Police Department
CAL FIRE	California Department of Forestry and Fire Protection
CBC	California Building Code
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CHP	California Highway Patrol
County	County of Riverside
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
FHSZ	Fire Hazard Severity Zone
I-	Interstate
LRA	Local Responsibility Area
NIMS	National Incident Management System
OA	Operational Area
OA EOP	Riverside County Operational Area Emergency Operations Plan
OES	Office of Emergency Services
Project	Beaumont Heights Project
RCFD	Riverside County Fire Department
RSO	Riverside County Sheriff's Office
SEMS	State Emergency Management System
SR-	State Route
SRA	State Responsibility Area
TRA	Temporary Refuge Area
VHFHSZ	Very High Fire Hazard Severity Zone
WES	Wildfire Evacuation Study
WUI	Wildland-Urban Interface

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Executive Summary

The Beaumont Heights Project (Project) proposes to develop four industrial buildings totaling approximately 5,178,206 square feet of industrial land uses, which may include, but are not limited to, warehousing, distribution, manufacturing, accessory offices, and storage. The Project site is located in unincorporated Riverside County (County), west of the City of Beaumont's (City) eastern jurisdictional boundary and east of State Route 79. The Project further proposes to annex the development site and the associated improvement areas into the City's jurisdiction, which would require Riverside County Local Agency Formation Commission approval. The Proposed Project will be consistent with both the City and County plans and procedures, when conflicting, the more restrictive measure will apply to the Project.

The Project site is designated a Very High Fire Hazard Severity Zone (VHFHSZ) in State Responsibility Area (CAL FIRE 2024). As described further in the Project's Fire Protection Plan (Dudek 2025), development in a designated VHFHSZ is required to comply with all applicable requirements of the California Wildland-Urban Interface Code (CWUIC), California Building Code and California Fire Code . These requirements include enhanced construction features (e.g., Class A roof, vents, interior sprinklers, etc.) for ignition resistance, emergency access, and defensible space that work together to provide a systematic approach to fire protection.

Given the Project's setting in a VHFHSZ, the most likely cause of evacuation from the Project site is wildland fire; however, the fundamental components of this Wildfire Evacuation Study (WES) will serve to support overall emergency preparedness and evacuation in a manner consistent with applicable plans and policies. The purpose of this WES is to evaluate the Project's consistency with relevant emergency evacuation plans and emergency response plans, disclose the prevention and minimization regulations and measures applicable to the Project, and determine evacuation times for the existing and post-Project conditions, as well as provide emergency preparedness information and resources to increase occupant preparedness and facilitate efficient evacuation in the event of an emergency. Herein, information is provided addressing evacuation organization, planning and preparedness, evacuation routes, contingencies, potential shelter-in-place, and other related topics.

As part of the WES, evacuation time modeling was prepared to evaluate potential Project impacts to existing evacuation conditions. Five scenarios analyzed the time needed to evacuate the existing and future land uses with and without Project populations. Using conservative assumptions, these scenarios considered (1) existing (2024) conditions, (2) background (2030) conditions (3) Background (2030 – Phase 1 through Phase 3) with Project conditions, (4) cumulative with no Project conditions (2045), and (5) cumulative with Project conditions (2045 – Project buildout).

The key finding of this study is that the Project would not conflict with an emergency evacuation plan or emergency response plan, and impacts would be less than significant without mitigation. Further, the available roadway capacity is sufficient to safely accommodate the number of evacuating vehicles within the relevant areas with and without the Project development. Project impacts would be less than significant as this study demonstrates that evacuation times would be reasonable and would allow for safe evacuations to be conducted under all scenarios.

The Project would also not eliminate any existing evacuation routes. In an evacuation or emergency scenario, adequate emergency access would be maintained. Considering these facts and others discussed herein, the Project would not expose people to a significant risk of loss or death involving wildland fires related to evacuation, would not interfere with evacuation response planning, and would not result in inadequate emergency access.

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1 Introduction

The Beaumont Heights Project (Project) Wildfire Evacuation Study (WES) was prepared based on guidance from and is consistent with the City of Beaumont (City) Emergency Operations Plan (EOP) and the County of Riverside (County) Operational Area (OA) Emergency Operations Plan (EOP) including the Emergency Support Function 16, Evacuation and Re-entry. A complete copy of the City's EOP and County's OA EOP can be downloaded from the respective links below:

City:

https://tinyurl.com/beaumonteop

County:

https://rivcoready.org/about-emd/plans

1.1 Project Description

Project Location

The overall Project site is approximately 629.66 acres located primarily within unincorporated Riverside County. The Project site is west of the City's eastern jurisdictional boundary and east of State Route (SR-) 79. The Project also seeks approval from the Riverside County Local Agency Formation Commission for annexation into the City's jurisdiction. Surrounding land uses is primarily undeveloped land with scattered residential uses to the west and south, residential uses to the east and commercial and limited residential uses to the north (Figure 1, Project Vicinity). Access to Project site is provided at two points along SR-79, at the north and central portions of the Project site.

Project Summary

The Project proposes to develop four industrial buildings totaling approximately 5,178,206 square feet on a 385.99-acre portion of the approximately 629.66-acre site, water and recycled water utility improvements on 4.27 acres, and transportation improvements along SR-79 and utility installation along California Avenue on 57.26 acres (Figure 2, Project Site Plan). Additionally, 182.14 acres of the Project site would serve as a construction staging and earthwork balance area. Anticipated use of the industrial buildings include, but are not limited to, warehousing, distribution, manufacturing, accessory offices, and storage. Each of the four industrial buildings could be constructed to a maximum height of 50-feet and could operate 24 hours a day, employing approximately 6,114 employees. Parking for the Project would be provided on-site on all sides of each building with 5,397 automobile stalls, and 347 trailer stalls.

Building One (1) is 636,937 square feet with 673 automobile parking stalls and 32 trailer parking stalls. Building Two (2) is 1,386,044 square feet with 1,447 automobile parking stalls and no trailer parking stalls. Building Three (3) is 1,488,920 square feet with 1,550 automobile parking stalls and 110 trailer parking stalls. Building Four (4) is 1,666,305 square feet with 1,727 automobile parking stalls and 205 trailer parking stalls.

1.2 Applicable Regulations, Standards, and Planning Tools

1.2.1 Federal

1.2.1.1 Disaster Mitigation Act

The Disaster Mitigation Act of 2000 requires that a state mitigation plan, as a condition of disaster assistance, add incentives for increased coordination and integration of mitigation activities at the state level through the establishment of requirements for two different levels of state plans: "Standard" and "Enhanced." States that develop an approved Enhanced State Plan can increase the amount of funding available through the Hazard Mitigation Grant Program. The Disaster Mitigation Act also established a new requirement for local mitigation plans.

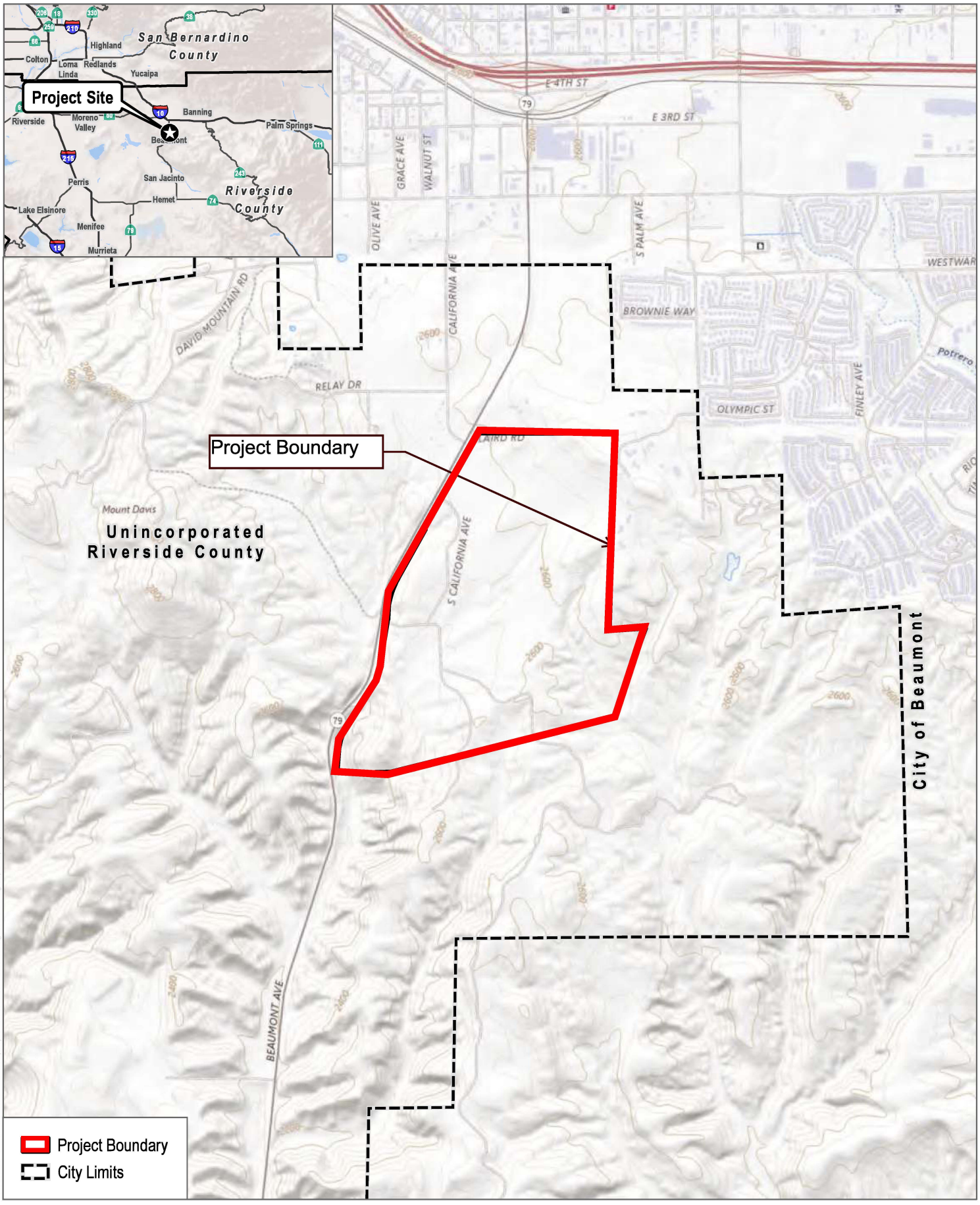
1.2.1.2 National Incident Management System (NIMS)

The National Incident Management System (NIMS) guides all levels of government, nongovernmental organizations, and the private sector to work together to prevent, protect against, mitigate, respond to, and recover from incidents. NIMS provides community members with a shared vocabulary, systems, and processes to successfully deliver the capabilities described in the National Preparedness System. The National Preparedness System is a Presidential Policy Directive establishing a common goal to create a secure and resilient nation associated with prevention, protection, mitigation, response, and recovery to address the greatest risks to the nation. One core area is fire management and suppression.

NIMS defines operational systems that guide how personnel work together during incidents.

1.2.1.3 Pet Evacuation and Transportation Standards Act

The Pets Evacuation and Transportation Standards Act of 2006 amends the Stafford Act, and requires evacuation plans to take into account the needs of individuals with household pets and service animals, prior to, during, and following a major disaster or emergency.



SOURCE: USGS National Map 2025

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Beaumont Heights Wildfire Evacuation Study

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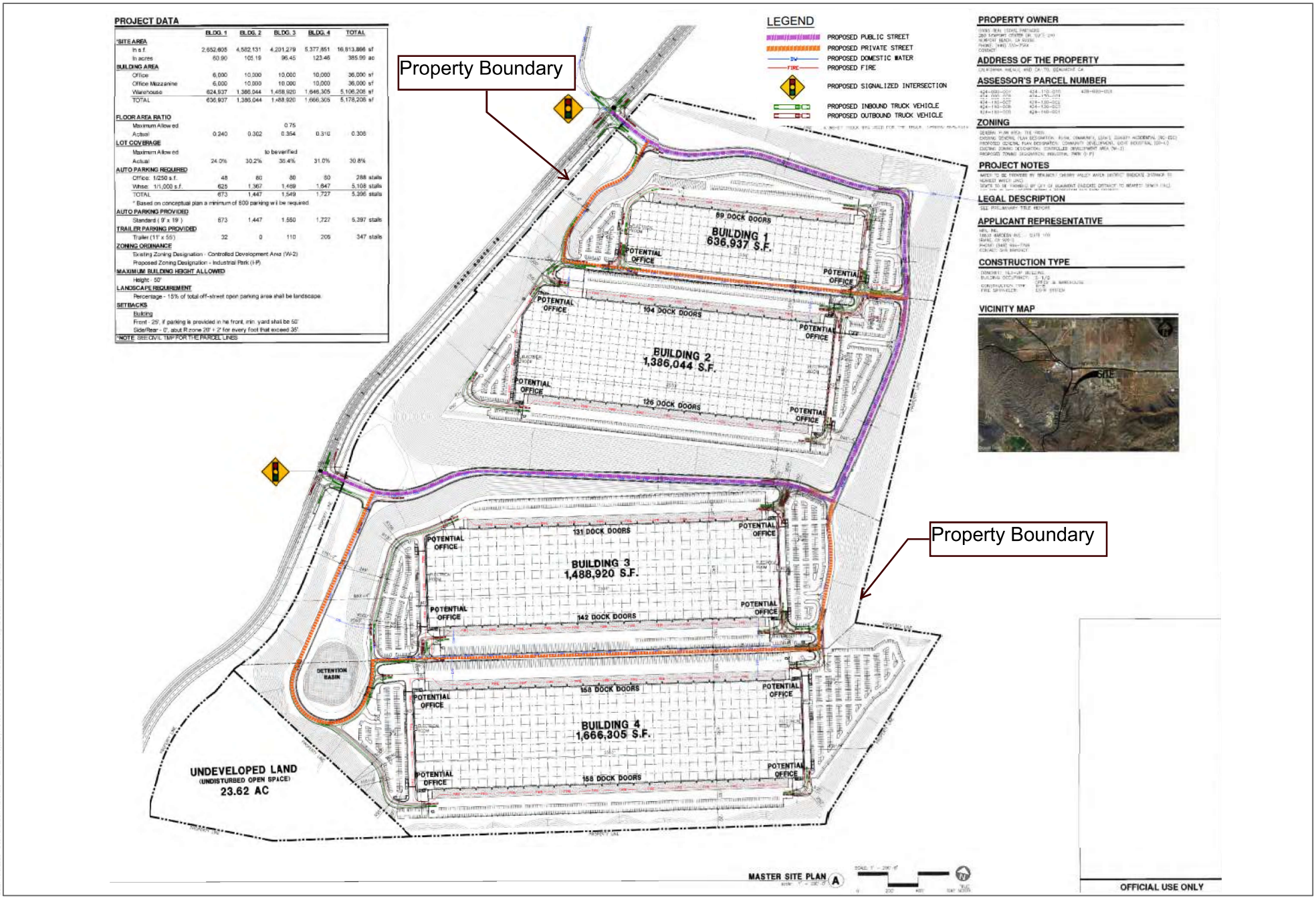

SOURCE: HPA 2025

DUDEK

0 425 850 Feet

FIGURE 2

Site Plan

Beaumont Heights Wildfire Evacuation Study

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1.2.2 State

1.2.2.1 Fire Hazard Severity Zones

To assist each fire agency in addressing its responsibility area, California Department of Forestry and Fire Protection (CAL FIRE) uses a severity classification system to identify areas or zones of severity for fire hazards within the state. CAL FIRE's adopted maps identified the fire hazard severity zones for State Responsibility Areas and identify Very High Fire Hazard Severity Zone (VHFHSZ) for Local Responsibility Areas (LRAs). On March 24, 2025, the Office of the State Fire Marshal (OSFM) released the 2025 Recommended Local Responsibility Area (LRA) Fire Hazard Severity Zone (FHSZ) Map for Southern California. All new LRA FHSZ maps were adopted by July 2025. The State Responsibility Area (SRA) maps have not been updated since their adoption in 2024.

The Project Site is designated as a VHFHSZ located within a SRA. Adjacent to the Project site, within the City of Beaumont's jurisdictional boundary to the east, the land is primarily designated as LRA VHFHSZ. The previous CAL FIRE Fire Hazard Severity Zone map also categorized the Project site as an SRA VHFHSZ; however, the local responsibility area (LRA) VHFHSZ designations increased northeast and northwest of the Project site

1.2.2.2 California Wildland-Urban Interface Code

With the adoption of the 2025 codes on January 1, 2026, all wildfire protection and safety-related requirements previously found in the California Building Code (CBC), California Fire Code (CFC), and California Residential Code (CRC) have been consolidated into the California Wildland-Urban Interface Code (CWUIC). The 2025 California Wildland Urban Interface Code (CWUIC), which is codified as Part 7 of the California Building Standards Code, consolidates all wildfire-related laws, codes, and regulations into a single wildfire-specific code. This includes the former Chapter 7A in the CBC, the former Chapter 49 in the CFC, and provisions of California Code of Regulations Title 14, Government Code Section 51182, and Public Resources Code Sections 4290 and 4291. The CWUIC includes special building construction regulations for development in designated fire hazard severity zones. The special construction materials and methods include design and fire-rating standards for exterior walls, doors, and windows. The CWUIC also establishes the standards for defensible space and vegetation fuel modification. The CWUIC works as a companion to the CBC and CFC to ensure ignition-resistant construction, fire apparatus access, and adequate fire flow in designated fire hazard severity zones.

1.2.2.3 California Fire Code

The 2025 California Fire Code (CFC) establishes regulations to safeguard against the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The Fire Code also establishes requirements intended to provide safety for and assistance to firefighters and emergency responders during emergency operations. The provisions of the Fire Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure throughout California. The Fire Code includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, fire safety during construction and demolition

1.2.2.4 California Emergency Services Act

The California Emergency Services Act (California Government Code Section 8550, et seq., provides for the creation of an Office of Emergency Services, assign and coordinate functions and duties to be performed during an emergency, facilitate mutual aid, and assign resources (including manpower and facilities) throughout the state for dealing with any emergency that may occur.

1.2.2.5 California Office of Emergency Services

The California Office of Emergency Services (OES) is responsible for the coordination of overall state agency response to disasters. Assuring the state's readiness to respond to, recover from all hazards and assisting local governments in their emergency preparedness, response, recovery, and mitigation.

1.2.2.6 Standardized Emergency Management System (SEMS)

The Standardized Emergency Management System (SEMS) is the cornerstone of California's emergency response system and the fundamental structure for the response phase of emergency management. The system unifies all elements of California's emergency management community into a single integrated system and standardizes key elements. SEMS incorporates:

- Incident Command System - A field-level emergency response system based on management by objectives.
- Multi/ Inter-agency coordination - Affected agencies working together to coordinate allocations of resources and emergency response activities.
- Mutual Aid - A system for obtaining additional emergency resources from non-affected jurisdictions.
- Operational Area Concept - County and its sub-divisions to coordinate damage information, resource requests and emergency response.

1.2.2.7 Attorney General's Guidance

The California Office of the Attorney General issued (October 2022) guidance (Guidance) outlining the Attorney General's recommendations for "best practices" for analyzing and mitigating wildfire impacts of development projects under the California Environmental Quality Act (CEQA). The Guidance is intended to help local governments' evaluation and approval considerations for development projects in fire-prone areas, and to help project design in a way that minimizes wildfire ignition and incorporates emergency access and evacuation measures. Importantly, the Guidance does not impose additional legal requirements on local governments, nor does it alter any applicable laws or regulations.

The Guidance states that evacuation modeling and planning should be considered for certain projects located in high or very high FHSZs as projects in these areas have the potential to present an increased risk of ignition and/or evacuation impacts. The Guidance encourages evacuation modeling and planning prior to project approval to provide greater flexibility regarding design modifications if the evaluation demonstrates such changes are required.

The Project is in an area designated as a VHFHSZ within a SRA and is adjacent to open space areas. However, the Project proposes a non-residential use with a project design that minimizes fire risks on a property that has two separate access roads and is proximate to both the I-10 and SR-79. This Wildfire Evacuation Study, which includes

modeling and the analysis of several evacuation scenarios that address existing conditions, cumulative projects and/or the project, incorporates elements and performs analysis contemplated by the Guidance.

The Guidance provides that evacuation modeling and analysis should include the following:

- Evaluation of the capacity of roadways to accommodate project and community evacuation and simultaneous emergency access.
  - Existing and future roadway capacities are analyzed in Section 4 of this Wildfire Evacuation Study.
- Assessment of the timing for evacuation.
  - Analysis of evacuation timing is detailed in Section 4.3.
- Identification of alternative plans for evacuation.
  - Alternative plans for evacuation (e.g., shelter-in-place as discussed in Section 2.4.4) would be feasible due to the high ignition resistance level of Project structures.
- Evaluation of the Project's impacts on existing evacuation plans.
  - Existing evacuation plans do not exist for the area so this element does not apply.
- Consideration of the adequacy of emergency access, including the Project's proximity to existing fire services and the capacity of existing services.
  - As disclosed in Section 4, Evacuation Road Network, emergency access is provided in a manner consistent with the fire code requirements.
- Traffic modeling to quantify travel times under various likely scenarios.
  - This Wildfire Evacuation Study conducted simulations using Vissim, a microscopic, multimodal traffic flow modeling software used to simulate different traffic conditions, such as drivers' behaviors during an evacuation. In Vissim simulations, roadway capacity is accounted for and each vehicle in the traffic system is individually tracked through the model and comprehensive measures of effectiveness, such as average vehicle speed and queueing, are collected on every vehicle during each 0.1 second of the simulation.

1.2.3 Regional and Local

1.2.3.1 Riverside County Emergency Operations Plan

The 2024 Riverside County Emergency Operations Plan (EOP) describes a comprehensive emergency management system that provides for a planned response to disaster situations associated with natural disasters, technological incidents, terrorism, and nuclear-related incidents. It delineates operational concepts relating to various emergency situations, identifies components of the Emergency Management Organization, and describes the overall responsibilities for protecting life and property and providing for the overall well-being of the population. The plan also identifies the sources of outside support that might be provided (through mutual aid and specific statutory authorities) by other jurisdictions, state and federal agencies, and the private sector.

https://rivcoready.org/sites/g/files/aldnop181/files/users/user41/RivCo%20EOP%202024.pdf

1.2.3.2 Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan

The purpose of the County's Multi-Jurisdictional Local Hazard Mitigation Plan (County of Riverside 2023) is to identify the County's hazards, review and assess past disaster occurrences, estimate the probability of future occurrences, and set goals to mitigate potential risks to reduce or eliminate long-term risk to people and property from natural and human-made hazards. An important Riverside County Multi-Jurisdictional Hazard Mitigation Plan component is the Community Emergency Response Team, which educates community members about disaster preparedness and trains them in basic response skills, including fire safety.

https://rivcoready.org/sites/g/files/aldnop181/files/2023-08/MJLHMP%208.7.23.pdf

1.2.3.3 Riverside County Fire Code

The 2025 California Codes as adopted by the California Building Standards Commission and amended by cities, counties, and fire districts became effective January 1, 2026. The Project would be required to comply with applicable portions of the 2025 California Fire Code (CFC) along with local amendments to the code. Riverside County had previously adopted the 2022 California Building Standards Code; however, with the 2025 California codes now effective, this project must comply with the 2025 CFC as adopted and amended by Riverside County. The Code therefore applies to all unincorporated areas of Riverside County. Provisions of the California Fire Code are described under State Regulations, above.

The Project will be consistent with the 2025 edition of the CFC or applicable code as adopted and amended by RCFD and the City of Beaumont at the time of construction.

1.2.3.4 City of Beaumont Emergency Operations Plan

The primary objective of the City of Beaumont Emergency Operations Plan (EOP) from 2021 is to integrate and synchronize all City facilities and personnel into a streamlined structure capable of promptly and efficiently addressing any emergency situation, including the need for evacuations. The EOP outlines the functions of the City of Beaumont Emergency Operations Center (EOC), which serves as the central administrative body responsible for overseeing and harmonizing the emergency response efforts of different City departments and external agencies. The purpose of the plan is to promote collaboration and coordination among multiple agencies and jurisdictions, specifically fostering effective communication and cooperation between the City of Beaumont, Riverside County, special districts, and state agencies during emergency operations.

1.2.3.5 City of Beaumont Local Hazard Mitigation Plan

The City's 2019 Local Hazard Mitigation Plan (LHMP) is an Administrative Regulation adopted to facilitate to identification the City's hazards, review, and assessment of past disaster occurrences, estimate the probability of future occurrences and set goals to mitigate potential risks to reduce or eliminate long-term risk to people and property from natural and man-made hazards. This document is being updated by the City at the time of writing this WES.

1.2.3.6 City of Beaumont Fire Code

The 2025 California Codes as adopted by the California Building Standards Commission and amended by cities, counties, and fire districts are effective January 1, 2026. The City of Beaumont Fire Code consists of Beaumont Code of Ordinances

Title 15, Chapter 15.21, which adopts the 2025 California Fire Code with amendments listed in Chapter 5.21.020 of the City Code of Ordinances. Provisions of the California Fire Code are described under State Regulations, above.

1.2.3.7 City of Beaumont Building Code

The City's Building Code (BMC Title 15, Chapter 15.04) are intended to regulate the construction of applicable facilities and encompasses (and formally adopts) associated elements of the CBC. Specifically, this includes regulating the "regulating the erection, construction, enlargement, alteration, repair, moving, removal, demolition, conversion, occupancy, use, height, area and maintenance of all structures and certain equipment therein." The City of Beaumont adopted the 2025 California Building Code with amendments. Provisions of the California Building Code are described under State Regulations, above.

1.2.3.8 City of Beaumont Weed Abatement Program

The City's Hazardous Weed Abatement Standards (City of Beaumont Fire Code 304.1-304.1.2, City of Beaumont Ordinances 8.08.010, 8.08.015, 8.08.020) are intended to minimize wildland fire hazards through prevention activities and programs. These regulations follow Government code sections 39501 and 39502 and give responsibility to property owners, leasers, and occupants of the property to ensure that the prevention and abatement of public nuisances caused by weeds, hazardous vegetation, or rubbish on or about any parcel.

Chapter 6 of the CWUIC, described above in Section 1.2.2.2, as adopted and amended by the City, establishes vegetation management requirements for development within areas identified as High or Very High FHSZ, which includes 100 feet of fuel modification on publicly or privately-owned lands adjacent to native or naturalized vegetation. The City requires Fuel Modification Plans for all new development in the WUI, which are intended to reduce the risk of significant loss, injury, or death involving wildland fires.

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2 Local and Regional Evacuation Planning

Evacuation is defined by the State of California as the organized, phased and supervised withdrawal, dispersal, or removal of civilians from dangerous or potentially dangerous areas and their reception and care in safe areas (Cal OES, 2017). When the threat passes, evacuees can return to their normal activities, or make suitable alternative arrangements. Evacuation during a wildfire is not typically directed by the fire agency, except in specific areas where fire personnel may enact evacuations on-scene. Local law enforcement has primary responsibility for emergency evacuations.

Fire Services are provided to the City by the Riverside County Fire Department and CAL FIRE. The closest available fire station is typically dispatched, which would be the Riverside County Fire Department Station 66. Evacuations of the unincorporated County would be directed by the Riverside County Sheriff and within City limits would be directed by the Beaumont Police Department (BPD). During any evacuation event that exceeds normal BPD capacity, the County OA Emergency Operations Center (EOC) will be activated. In the event the County OA EOC is activated, the EOC Law Enforcement Branch will activate the Evacuation Re-Entry Unit to coordinate the countywide evacuation and re-entry functions. Incident information and resource needs will be communicated from the RSO to the OA EOC Law Enforcement Branch.

Every evacuation scenario will include some level of unique challenges, constraints, and fluid conditions that require interpretation, fast decision making, and alternatives. For example, one roadway incident that results in blockage of evacuating vehicles may require short-term or long-term changes to the evacuation process. Risk is considered high when evacuees are evacuating late, and fire encroachment is imminent. This hypothetical scenario highlights the importance of continuing to train responding agencies, model various scenarios, educate the public, provide contingency plans, and take a very conservative approach to evacuation decision timelines.

Equally as important, the evacuation procedures should be regularly updated with lessons learned from actual evacuation events. At the time of this WES's preparation, there is no encompassing emergency evacuation plan available for the County. This WES was prepared and is consistent with the City's and County OA EOP's evacuation planning standards and can be integrated into a regional evacuation plan and other pre-plans when and if area officials and stakeholders (CAL FIRE, RCFD, OES, BPD, RSO, and others) complete one.

The following sections summarize emergency operations procedures relevant to an evacuation of the Project.

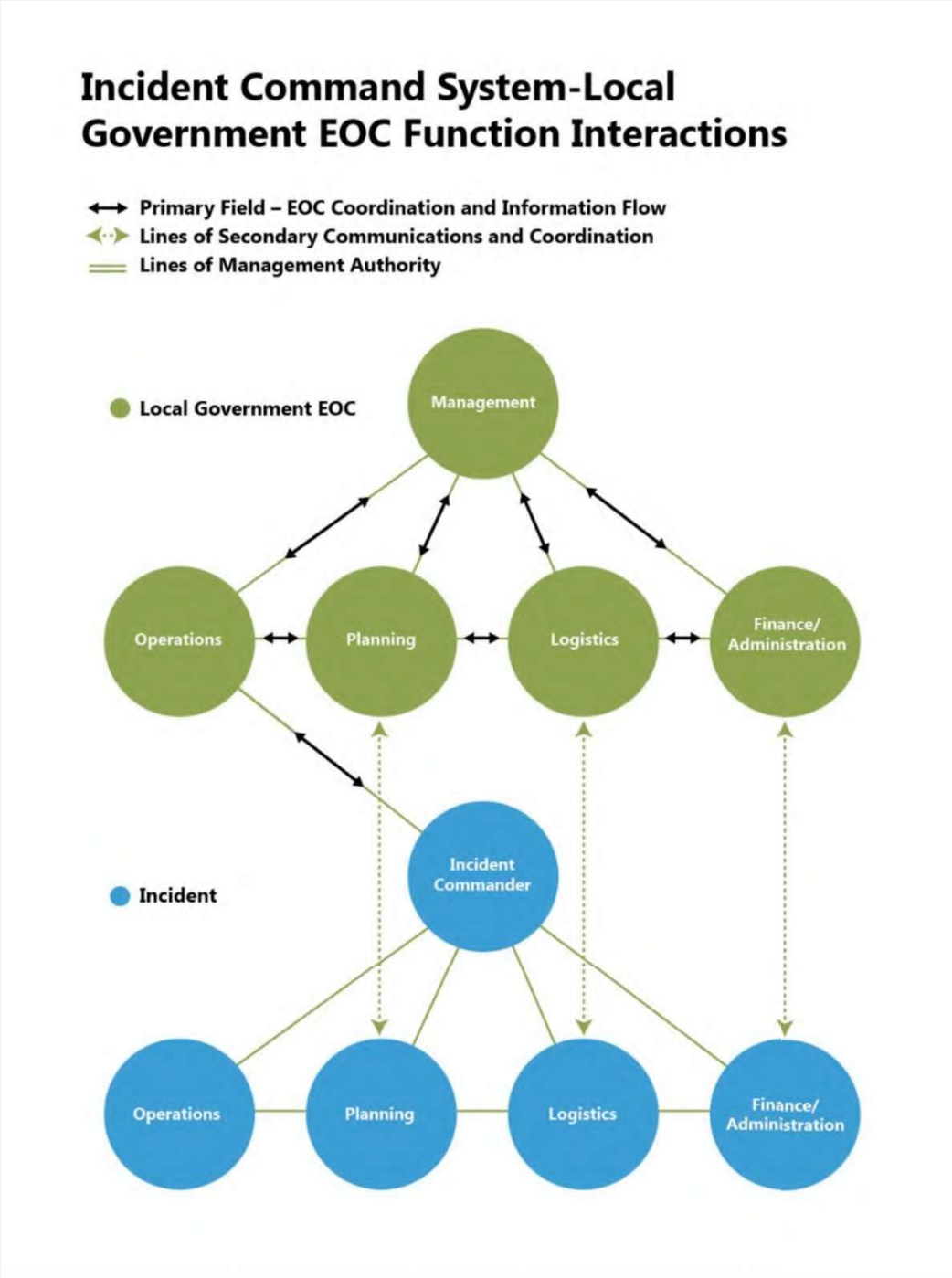
2.1 City and County Emergency Operations Procedures

To establish a framework for implementing well-coordinated evacuations, the City and County, like most California emergency operations agencies, have adopted evacuation procedures in accordance with the State of California's SEMS and the Federal NIMS. Large-scale evacuations are complex, multi-jurisdictional efforts that require coordination between many agencies and organizations. Emergency services and other public safety organizations play key roles in ensuring that an evacuation is effective, efficient, and safe. An EOP is the foundation for response and recovery operations. The City EOP in conjunction with the County EOP will be used to coordinate events from small-scale localized emergencies to large disasters that impact several jurisdictions.

The City EOP sets forth basic protocols which dictate who is responsible for an evacuation effort and how regional resources may be requested and coordinated. First responders are responsible for determining initial protective actions before EOCs and emergency management personnel have an opportunity to convene and gain situational awareness. Initial protective actions are shared/communicated to local EOCs and necessary support agencies as

soon as possible to ensure an effective, coordinated evacuation. Figure 3, Incident Command System Functions, summarizes the functional interactions of local government EOCs under the Incident Command System.

Figure 3 : Incident Command System Functions



During a multi-jurisdictional evacuation effort, the BPD will declare and coordinate and be assisted by other law enforcement and support agencies. Law enforcement agencies, highway/road/street departments, and public and private transportation providers will conduct evacuation operations. Procurement, regulation, and allocation of resources will be accomplished by those designated. Evacuation operations will be conducted by the following agencies:

- City of Beaumont Police Department
- Riverside County Sheriff's Department
- Recreation and Parks Rangers
- Riverside Emergency Animal Rescue System (REARS)
- Beaumont Office of Emergency Services (OES)
- Riverside County Emergency Management Department (EMD)
- California Highway Patrol (CHP)
- Transportation agencies
- American Red Cross
- Other City, County, and state agencies, as needed

2.2 Evacuation Objectives

Overall objectives of emergency evacuation operations and notifications for the City of Beaumont are to:

- Expedite the movement of persons from hazardous areas
- Institute access control measures to prevent unauthorized persons from entering vacated, or partially vacated areas
- Coordinate evacuation to appropriate transportation points, which may include temporary evacuation points, temporary refuge areas (TRA), and/or shelters
- Coordinate adequate means of transportation for individuals with disabilities and others with access and functional needs, which includes, but is not limited to, older adults, children, and individuals who are transportation disadvantaged
- Coordinate the procurement, allocation, and use of necessary transportation and law enforcement resources by means of mutual aid or other agreements
- Coordinate with affected law and enforcement agencies to control evacuation traffic and road closures
- Account for the needs of individuals with household pets and service animals prior to, during, and following a major disaster or emergency
- Provide initial notification, ongoing, and repopulation communications to the public through the Joint Information Center
- Coordinate the safe repopulation of the evacuated persons

After approval from the Riverside County Local Agency Formation Commission, the Project would be annexed into the City; therefore within the jurisdiction of the BPD. The BPD is the lead agency for conducting evacuations within the City. If necessary, Unified Command will assess and evaluate the need for evacuations with cooperating agencies. Local law enforcement will determine the orders and conduct all evacuations according to established

procedures, which are outlined in the County EOP Evacuation annex. Additionally, as part of the Unified Command, the BPD will identify available and appropriate evacuation routes and coordinate evacuation traffic management with the California Department of Transportation, Riverside Sheriff's Office (RSO), California Highaway Patrol, other supporting agencies, and jurisdictions.

2.3 Evacuation Coordination Process

The decision to evacuate an area is not made lightly and there is a significant impact to public safety and the economy. The following process describes how emergency evacuation decisions within the OA will be coordinated, allowing emergency managers and other supporting response organizations to make collaborative decisions.

The Project is proposed to be annexed into the City of Beaumont jurisdiction, therefore if approved, BPD will be the agency responsible for the evacuation coordination process.

If the emergency only impacts the City, BPD will make the decision to evacuate:

- Based on the information gathered, local jurisdictions will generally make the determination on whether to evacuate communities as the need arises, on a case-by-case scenario basis.
- The decision to evacuate will depend entirely upon the nature, scope, and severity of the emergency; the number of people affected; and what actions are necessary to protect the public.
- Local jurisdictions may activate their EOC and conduct evacuations according to procedures outlined in the EOP.
- The OA EOC may make recommendations on whether a community should evacuate and may help coordinate the evacuation effort.
- The Evacuation Annex is automatically activated when an incident occurs requiring an evacuation effort that impacts two or more jurisdictions within the OA.

If the emergency impacts multiple jurisdictions within the OA:

- All impacted jurisdictions may activate the EOCs and the OA EOC will be activated, including the OA EOC Joint Information Center.
- The OA EOC will begin obtaining situational awareness, understanding the severity of the incident.
- The OA EOC will coordinate with fire, law enforcement, public health, and other relevant support agencies to obtain recommendations on protective actions.
- The OA EOC will coordinate with jurisdictional EOCs, emergency management personnel and other public safety personnel. The Policy Group within the EOC will coordinate with jurisdictions leaders across the OA to identify command decisions, including:
  - Gaining regional situational awareness
  - Determining response status
  - Reviewing status of initial protective actions
  - Considering additional protective actions
  - Evaluating public information needs
  - Determining next steps
  - Establishing a regular schedule for internal and external updates

- The OA EOC Joint Information Center will coordinate emergency public information to citizens in accordance with procedures established within the OA EOP.
- The OA EOC may support coordinating the evacuation response according to the OA EOP, including:
  - Providing transportation for those who need assistance through the activation of emergency transportation services agreements
  - Providing support for individuals with disabilities and others with access and functional needs during the evacuation process, which may include, but is not limited to, providing assistance with wayfinding, supervision, and language interpretation;
  - Coordinating and communicating with the private sector, community-based organizations, and faith-based organizations to utilize services and resources available to support the response;
  - Coordinating the provision of accessible care and shelter services.

The Riverside County Sheriff's Office Operations Center (OOC) may activate in an evacuation event that exceeds normal Riverside County Sheriff's Office capacity. The following functions take place at the OOC:

- Provide staff to fulfill the EOC Law Branch assignment
- Utilize the five functions of the Incident Command System and filling Planning, Logistics, and Finance sections; the Operations section will be under the direction of the Incident Command
- Support Incident Command/Unified Command and identify ground transportation corridors in the Riverside County OA to use as primary evacuation routes during an evacuation
- Initiation of off-duty personnel recall
- Request and coordinate regional law enforcement resources under the California Master Mutual Aid Agreement
- Request mutual aid through the Operational Area Law Enforcement Mutual Aid Coordinator
- Staff resource staging areas
- Support the OA Law Enforcement Mutual Aid Coordinator in acquiring mutual aid resources, as necessary
- Complete and maintain status reports for major incidents requiring or potentially requiring OA, Federal, and/or State response
- Maintain the status of unassigned law enforcement resources
- Maintain expenditure records to facilitate reimbursement

2.4 Evacuation Response Operations

An evacuation of any area requires significant coordination among numerous public, private, and community/non-governmental organizations. Wildfire evacuations will typically allow time for responders to conduct evacuation notification in advance of an immediate threat to life safety; giving occupants time to gather belongings and make arrangements for evacuation. Other threats, including wildfires igniting nearby, may occur with little or no notice and certain evacuation response operations will not be feasible (for example, establishing contra flow requires between 24 to 72 hours to be implemented). Every attempt will be made to assist people with safe evacuation, and risk to first responders is an additional important consideration. People are encouraged to evacuate early and to help their coworkers, neighbors, friends, and family to evacuate if doing so will not cause danger to themselves or others.

2.4.1 Emergency Communications

As demonstrated during large and localized evacuations occurring throughout the County over the past 10 years, an important component to successful evacuation is early assessment of the situation and early notification via managed evacuation declarations. The City utilizes early warning and informational programs to help meet these important factors. Among the methods available to citizens for emergency information are radio, television, social media/internet, neighborhood patrol car, aerial public address notifications, and Reverse 911 or Alert RivCo.

The City instituted the B-Alert system as an emergency alert notification program for incidents that affect City residents and visitors. Occupants of the Beaumont Heights Project can sign up for B-Alerts using the Everbridge mobile app, the online Member Portal, or by texting Beaumont to 888777. The B-Alert system is just one of many ways occupants of the project can obtain emergency information. Alerts may be sent for a variety of reasons, including wildfire evacuation notices, as well as other disaster notifications and public safety emergencies. Alerts are received through phone calls, text messages, and emails.

- Mobile App Download:
  - https://apps.apple.com/us/app/everbridge/id565859420
  - https://play.google.com/store/apps/details?id=com.everbridge.mobile.iv.recipient&hl=en_CA
- Member Portal Online Registration:
  - https://member.everbridge.net/338104120508785/login

The City also utilizes Alert RivCo, which is a regional asset managed by the County of Riverside Emergency Management Department. In the event of a wildfire within the City limits, the Incident Command, RCFD or other City departments will coordinate with BPD and/or RSO to release emergency communications to affected populations. The RSO has the responsibility to release an emergency notification to affected population via the Alert RivCo system. Therefore, occupants of the Beaumont Heights Project are strongly advised to register all business land lines, mobile phone numbers and email addresses with Reverse 9-1-1 and Alert RivCo system (https://rivco.genasys.com/portal/en/register) in order to receive emergency evacuation instructions. The occupants of Beaumont Heights can utilize various media outlets as a good source of information, via television and radio, on overall emergency situations and how occupants should respond.

- Alert RivCo: https://rivcoready.org/alert-rivco
- Genasys Protect Mobile App: https://protect.genasys.com/download

Radio is an additional way to receive emergency alert information. The Riverside Emergency Alert System is county-wide and broadcasts emergency information via six radio stations: KFI 640 AM, KFWB 980 AM, KNX 1070 AM, KFRG 95.1 FM, KVCR 91.9, and KXFG 92.9 FM.

Social media provides another outlet for news:

- Beaumont Police Department:
  - https://www.facebook.com/beaumontCApolice/
  - https://x.com/beaumontca_pd
- Riverside County Fire Department:
  - https://www.facebook.com/CALFIRERRU/

  - https://x.com/CALFIRERRU
- Riverside County Sheriff's Office:
  - https://www.facebook.com/riversidecountysheriff
  - https://x.com/rso

2.4.2 Evacuation Points and Shelters

When the BPD, RSO, or Incident Command (IC) implements an evacuation order, they coordinate with the responding fire and rescue agency, the EOC, and others, to decide on locations to use as a Temporary Evacuation Point. The BPD will provide emergency alerts through the Everbridge Nixle platform to direct evacuees to the established Temporary Evacuation Points or shelters. These evacuation points will serve as temporary safe zones for evacuees and will provide basic needs such as food, water, and restrooms. Emergency shelters are opened when at least one overnight stay is necessary. Possible shelters and assembly areas in the Project vicinity that can provide at least short-term refuge and that would be designated by emergency managers during an evacuation include public schools and recreation centers. Basic services are provided at emergency shelters, which includes meals, accessible shower facilities, dormitory management, health, and behavioral health services. Some temporary evacuation points may be suitable to be converted into an emergency shelter location, if necessary and available.

An interactive map of the activated mass care locations will be updated regularly and can be found at:

https://www.arcgis.com/apps/mapviewer/index.html?layers=18c2ee5376f1465e88dd79b384c39e5c.

If there are occupants unable to evacuate or in need of transportation assistance to get to a Temporary Evacuation Point or shelter, the BPD or IC may establish transportation points to collect and transport people without transportation resources to evacuation points. These transportation points should be large, well-known sites such as shopping centers, libraries, and schools. Transportation should be accessible to all populations, including people with disabilities and other access and functional needs.

2.4.3 Pet Evacuations

The Pets Evacuation and Transportation Standards Act of 2006 amends the Stafford Act and requires evacuation plans to consider the needs of individuals with household pets and service animals prior to, during, and following a major disaster or emergency.

The Riverside County Department of Animal Services (DAS) has plans in place to transport and shelter pets in a disaster under ESF 20 of the OA EOP. Domestic animals in need of housing will be accepted at and/or transported to animal shelters used by DAS; these may include County animal shelters and/or partner agency shelters, such as Animal Friends of the Valley. DAS will provide provisions for service animals at human shelters to include food, water, relief area identification and any other provisions needed to support the animal. Depending on the severity of the imminent or actual event, it may be necessary to prepare for and operate additional animal shelters. If ARC shelters are open for human evacuees, a determination will be made regarding the feasibility of co-locating animals at shelters. In most cases, humans and animals (not including service animals) cannot be co-located at the same shelter site due to concerns with allergies, bites, etc. Service animals are permitted at human shelters at all times and in every circumstance. If colocation is an option, animal response teams will be dispatched to ARC shelter sites

and arrangements will be made to obtain emergency supplies and any specialized equipment needed to care for the animals.

Resources for emergency animal evacuations can be found at https://animalevacuation.org/.

If co-location is not an option, or if the animal is not a service animal, existing animal shelter sites will be utilized as noted above, DAS will provide for the pick-up and transport of animals from human shelter sites to animal shelter sites. Animals at shelter sites will be provided for with shelter, food, water and other necessary provisions. DAS has a professional system they use to identify and re-unify animals with their owners.

This is not a residential development, so there will likely not be any pets or small animals onsite, with the exception of possible service animals.

2.4.4 Shelter-in-Place

Sheltering-in-place is the practice of going or remaining indoors during or following an emergency event. This procedure is recommended if there is little time for the public to react to an incident and when it is safer for the public to stay indoors for a short time rather than travel outdoors. Sheltering-in-place also has many advantages because it can be implemented immediately, allowing people to remain in their familiar surroundings and providing individuals with everyday necessities such as telephone, radio, television, food, and clothing. However, the amount of time people can stay sheltered-in-place is dependent upon availability of food, water, medical care, utilities, and access to accurate and reliable information.

The decision to evacuate or shelter-in-place will be made by field command (SEMS field level) and in accordance with existing plans and protocols. Sheltering-in-place is the preferred method of protection for people that are not directly impacted or in the direct path of a hazard. This will reduce congestion and transportation demand on the major transportation routes for those that have been directed to evacuate by police or fire personnel. The residences to the north and to the east of the proposed Project may include structures in varying states of ignition resistance. If the buildings are older and not built to the current building codes, including ignition resistant standards, responding fire and law enforcement personnel may not be able to direct existing occupants to temporarily refuge in their homes; however, it would be possible for occupants of the Project to shelter in place if necessary.

The structures within the Beaumont Heights Project site would conform to the ignition-resistant building codes previously codified in Chapter 7A of the California Building Code, now included in Chapter 5 of the CWUIC, would be ignition-resistant, defensible, and designed to require minimal firefighting resources for protection, which enables

3 Beaumont Heights Project Evacuation Procedures

The following provides a discussion of the types of evacuations that Project occupants could experience (e.g., pre-planned, late-notice, etc.), and Project specific evacuation contingencies, and Project specific procedures for social aspects of evacuation. For purposes of this Wildfire Evacuation Study, the first and most logical choice for all the occupants within the boundaries of the Beaumont Heights Project is to adhere to the principles and practices of the "Ready, Set, Go!" Program. Under this program, individuals are urged to evacuate as soon as they are notified to do so or earlier if they feel uncomfortable. Directions on evacuation routes will be provided in most cases, but when not provided, employees of the Project will proceed according to known available routes away from the encroaching fire. Occupants are cautioned not to rely on navigation aid apps, which may inadvertently lead them toward an oncoming fire.

3.1 Beaumont Heights Industrial Project Evacuation

Evacuation is considered by many to offer the highest level of life protection to the public, but it can also result in evacuees being placed in harm's way if the time available for evacuation is insufficient (Cova et al. 2011). It is estimated that the maximum amount of time needed to move the Beaumont Heights Project population to urbanized and/or designated evacuation areas may require up to approximately 4 hours and 33 minutes under varying constraints that may occur during an evacuation. This does not include additional allowances for the time needed to detect and report a fire, for fire response and on-site intelligence, for phone, patrols, and aerial based notifications, and for notifying special needs citizens.

Wolshon and Marchive (2007) simulated traffic flow conditions in a computer derived Wildland Urban Interface (WUI) under a range of evacuation notice lead times and housing densities. To safely evacuate more people, they recommended that emergency managers (1) provide more lead time to evacuees and (2) control traffic levels during evacuations so that fewer vehicles are trying to exit at the same time.

Wildfire emergency response procedures will vary depending on the type of wildfire and the available time in which decision makers (IC, BPD, RCFD, CAL FIRE, RSO, and/or City and County Emergency Management Department) can assess the situation and determine the best course of action. Based on the Beaumont Heights Project and surrounding communities, its road network, and the related fire environment, the first and primary type of evacuation envisioned is an orderly, pre-planned evacuation process where people are evacuated to more urban areas further from an encroaching wildfire (likely to the SR-60, SR-79, I-10 so evacuees can travel north, east, or west towards the urban areas of Cherry valley, Banning, and Moreno Valley) well before fire threatens.

The second type of evacuation, which is highly undesirable from a public safety perspective, is an evacuation that occurs when fire ignites close to vulnerable communities. This type of situation is inherently dangerous because there is generally a higher threat to persons who are in a vehicle on a road when fire is burning in the immediate area than in a well-defended, ignition-resistant home. Conditions may become so poor that the vehicle drives off the road or crashes into another vehicle, and flames and heat overcome the occupants. A vehicle offers little shelter from a wildfire if the vehicle is situated near burning vegetation or catches fire itself. This type of evacuation must be considered a very undesirable situation by law and fire officials in all but the rarest situations where late

evacuation may be safer than seeking temporary refuge in a structure (such as when there are no nearby structures, the structure[s] is/are already on fire, or when there is no other form of refuge). Temporary refuge would be possible within the Project's structures, but structures within surrounding communities, as previously discussed, are less desirable due to their higher vulnerability to ignition.

The third potential type of evacuation is a hybrid of the first two. In cases where evacuation is in process and changing conditions result in a situation that is considered unsafe to continue evacuation, it may be advisable to direct evacuees to pre-planned temporary refuge locations, including their own home if it is ignition-resistant and defensible. As with the second type of evacuation discussed above, this situation is considered highly undesirable, but the evacuation pre-planning must consider these potential scenarios and prepare decision makers at the IC level and at the field level for enacting a contingency to evacuation when conditions dictate.

Indications from past fires and related evacuations, in the City, County, and throughout Southern California, which have experienced increasingly more frequent and larger fires, are that evacuations are largely successful, even with a generally unprepared populace. It then stands to reason that an informed and prepared populace would minimize the potential evacuation issues and related risk to levels considered acceptable from a community perspective.

Evacuation orders or notifications are often triggered based on established and pre-determined model buffers, which are based on topography, fuel, moisture content of the fuels and wind direction. Evacuations are initiated when a wildfire reaches or crosses one of these pre-determined buffers. Evacuations can also be very fluid. The IC, law enforcement, and OES would jointly enact evacuations based on fire behavior.

3.1.1 Evacuation of Special Populations and Individuals with Access and Functional Needs

Vogt (1990, 1991) defines special populations as those groups of people who, because of their special situations or needs, require different planning strategies from those of the general population. Special needs populations in the City of Beaumont include people with access and functional needs (AFN), the hearing or visually impaired, senior citizens, foreign speaking, visitors passing through the area, temporary visitors such as day workers or customers.

People with AFN refers to individuals with physical, intellectual, or developmental disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking; older adults; children; people living in institutionalized settings, or those who are low-income, homeless, pregnant or transportation disadvantaged, including, but not limited to, those who are dependent on public transportation or are pregnant (CalOES 2023).

Special populations and temporary visitors may not have knowledge of the area's fire hazard, they may not know how to react in a fire emergency, and they may not understand what they are being told to do. To ensure all members of the community understand the emergency alerts and resources available, Unified Command should use accessible messaging and communication methods. Individuals with AFN may not be able to evacuate themselves in their own vehicles or may be carless. To prepare for emergency transportation to evacuate special populations, the Project should identify their transportation resources that will be available to special populations, and if deemed insignificant, should enter a joint agreement with transportation providers and paratransit agencies in surrounding areas.

Individuals with AFN should create a personal emergency plan for themselves and, if necessary, their service animals.

3.1.2 Animal Evacuations

Animal evacuations present a host of challenges that may affect the overall successful movement of people and their possessions out of harm's way. For example, livestock owners do not always have the means to load and trailer their livestock out of the area. Further, most wildfire evacuation relief shelters or commercial lodging facilities do not allow people to bring in pets or other animals. Sorensen and Vogt (2006) indicate that an issue receiving increasing attention is what evacuees do with pets or other animals such as livestock when they leave their homes and whether having pets or animals impacts their decision to evacuate.

This Project does not propose any land uses that would support large animals or livestock onsite.

3.1.3 Re-entry Procedures

An important component of evacuations is the citizen re-entry process. The Evacuation & Reentry Unit under the Law Enforcement Branch is responsible for the coordination of re-entry of evacuated populations as detailed in the City's EOP. If the evacuation required coordination with the County, the County's EOP Re-Entry Protocol establishes guidance and procedures to ensure a coordinated, safe, and orderly re-entry into impacted communities following an incident.

In the event the City's EOC is activated, the EOC Logistics Officer will give priority to coordinating the evacuation and rescue operations. The EOC Law Enforcement Branch will serve as the primary agency re-entry activities with support from other agencies including RSO, Riverside EMD, Cal OES Law Enforcement Mutual Aid Region VI, American Red Cross, Volunteer Organizations Active in Disaster, CHP, and more. When local resources are overwhelmed or unable to manage the emergency on their own, aid will be coordinated through the County of Riverside EMD Duty Officer, or Riverside OA EOC. In most cases, the EOC will remain activated until full re-entry is complete. In the event that the EOC has been deactivated, the IC or the Liaison Officer of the Incident Management Team will initiate re-entry procedures.

The IC will designate a Re-Entry Coordinator and the Operations Section Chief of the EOC will coordinate with and support the Re-Entry Coordinator. The Re-Entry Coordinator is responsible for coordinating the re-entry procedures with all involved agencies and ensuring effective communication.

The impacted areas must be thoroughly investigated to ensure it is safe for occupants to return and normal operations have been restored.

The public will be notified of the re-entry status through emergency broadcast radio, television, press releases, internet, 211, Alert RivCo, community briefings, and informational updates at shelters. Once evacuees are permitted to return, it is important that procedures are established to properly identify occupants and critical support personnel, as well as ensure the legitimacy of contractors, insurance adjustors, and other personnel. Re-entry points should be staffed by law enforcement personnel.

3.2 Civilian and Firefighter Evacuation Contingency

As of this document's preparation, no community in California has been directed to shelter-in-place during a wildland fire. Even the communities in Rancho Santa Fe, California, which are designed and touted as shelter-in-place communities, were evacuated during the 2007 Witch Creek Fire. This is not to say that people have not

successfully sheltered-in-place during wildfire, where there are numerous examples of people sheltering in their homes, in hardened structures, in community buildings, in swimming pools, and in cleared or ignition-resistant landscape open air areas. The preference will always be early evacuation following the "Ready, Set, Go!" model, but there exists the potential for unforeseen civilian evacuation issues, and having a contingency plan will provide direction in these situations that may result in saved lives.

Potential problems during wildfire evacuation from the Project area include:

- Inadequate time to safely evacuate
- Fire evacuations during rush hour traffic or when large events are occurring
- Blocked traffic due to accidents or fallen tree(s) or power pole(s)
- The need to move individuals who are unable to evacuate

As part of the Project's approval process, detailed plans are required to be submitted to the City's Building and Safety Department and will be provided to RCFD and RSO to support pre-planning. These pre-planning efforts focus on evacuation contingency planning for civilian populations when it is considered safer to temporary seek a safer refuge than evacuation.

As discussed throughout, the Project's structures would allow for the possibility of temporary sheltering while structures in surrounding communities may not be considered ignition-resistant, based on the existing codes when built, and therefore not appropriate for temporary refuge.

3.2.1 Safety Zones

The International Fire Service Training Association (IFTSA; Fundamentals of Wildland Fire Fighting, 3rd Edition) defines "safety zones" as areas mostly devoid of fuel, which are large enough to assure that flames and/or dangerous levels of radiant heat will not reach the personnel occupying them. Areas of bare ground, burned over areas, paved areas, and bodies of water can all be used as safety zones. The size of the area needed for a safety zone is determined by fuel types, its location on slopes and its relation to topographic features (chutes and saddles) as well as observed fire behavior. Safety zones should never be located in topographic saddles, chutes or gullies. High winds, steep slopes or heavy fuel loads may increase the area needed for a safety zone.

The National Wildland Fire Coordinating Groups, Glossary of Wildland Fire Terminology provides the following definitions for safety zones:

> *Safety Zone*. An area cleared of flammable materials used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas, which can be used with relative safety by firefighters and their equipment in the event of blowup in the vicinity.

According to the National Wildland Fire Coordinating Groups, safety zone(s):

- Must be survivable without a fire shelter
- Can include moving back into a clean burn

- May take advantage of natural features (rock areas, water, meadows)
- Can include constructed sites (clear-cuts, roads, helistops)
- Are scouted for size and hazards
- Consider the topographic location (larger if upslope)
- Should be larger if downwind
- Should not include heavy fuels
- May need to be adjusted based on site-specific fire behavior

The definition for a safety zone includes provisions for separation distance between the firefighter and the flames of at least four times the maximum continuous flame height. Distance separation is the radius from the center of the safety zone to the nearest fuels. Due to the dynamic nature of wildfire events it is important to have multiple contingencies, the urbanized areas nearby the Project site (e.g., paved roadways such as SR-79 and I-10) offer the best possibility for a safety zone for firefighter use. The Project will also include the ability for firefighters to seek safety zones within the ignition-resistant landscapes, but identification of other potential safety zones will require additional focused study by RCFD, CAL FIRE, and other fire and law enforcement agencies.

3.2.2 Temporary Firefighter Refuge Areas

FIRESCOPE California (Firefighting Resources of Southern California Organized for Potential Emergencies) was formed by legislative action to form a partnership between all facets of local, rural, and metropolitan fire departments, CAL FIRE and federal fire agencies. FIRESCOPE defines a contingency plan when it is not possible to retreat to a safety zone. This contingency includes establishment of firefighter temporary refuge areas (TRAs), which are defined as:

> A preplanned area where firefighters can immediately take refuge for temporary shelter and short-term relief without using a fire shelter in the event that emergency egress to an established safety zone is compromised.

Examples of a TRA may include the lee side of a structure, inside of a structure, large lawn or parking areas, or cab of a fire engine, amongst others. Differences between a TRA and a Safety Zone is that TRAs are closer to the immediate firefighting area, are considered a contingency to being able to get to a safety zone, do not include a requirement for a large area set back four times the flame lengths of adjacent fuels, and cannot be feasibly pre-planned until firefighters arrive on-scene and size up the situation.

FIRESCOPE appropriately notes that although safety zones and viable escape routes shall always be identified in the WUI environment, they may not be immediately available should the fire behavior increase unexpectedly. Often a TRA is more accessible in the WUI environment. A TRA will provide temporary shelter and short-term relief from an approaching fire without the use of a fire shelter and allow the responders to develop an alternate plan to safely survive the increase in fire behavior.

The major difference between a TRA and a safety zone is that a TRA requires another planned tactical action (i.e., TRAs cannot be considered the final action, but must include self-defense and a move out of the area when the fire threat subsides). A TRA should be available and identified on site at a defended structure. TRAs are NOT a substitute for a safety zone. TRA pre-planning is difficult, at best because they are very site- and fire behavior-specific. For the Project site, TRAs would likely include navigating into the densely developed areas where firefighters would be

separated from the unmaintained wildland fuels by wide areas including site-wide maintained landscapes, ignition-resistant residences, and wide roads that offer numerous opportunities for TRA.

The majority of Project site would be developed and paved surfaces, such as the parking areas, are considered TRAs. This is an important concept because it offers last-resort, temporary refuge of firefighters, and in a worst-case condition, occupants. This approach would be consistent with FIRESCOPE California (2013), which indicates that firefighters must determine if a safe evacuation is appropriate and if not, to identify safe refuge for those who cannot be evacuated, including civilians.

Each of the Project's structures that can be considered for TRA include the following features:

- Ignition-resistant construction materials
- Wide roadways with fire hydrants
- Maintained landscapes and roadside fuel modification
- Ember-resistant vents
- Interior fire sprinklers

Because there is the possibility that evacuation of the Project and surrounding communities may be less safe than temporarily refuging on site, such as during a fast-moving, wind-driven fire that ignites nearby, including temporary refuge within onsite structures that have been properly designed, constructed, and maintain with fire safety features (e.g., ignition resistant construction, fuel modification) is considered a contingency plan for the Project. This concept is considered a component of the "Ready, Set, Go!" model as it provides a broader level of "readiness" should the ability to execute an early evacuation be negated by fire, road congestion, or other unforeseen issues.

Note: This approach would be considered a last-resort contingency during wildfire with the primary focus being on early evacuation. The decision for evacuation or temporarily refuging onsite will be made by responding law enforcement and/or fire personnel.

3.3 PACE Planning for Evacuation

PACE evacuation planning is based on a military concept focused on mitigating risk by developing a strong primary plan along with three back up plans. If the Primary plan is compromised, the Alternate plan would be triggered. If the Alternate is considered not functional or not safe, the Contingency Plan is implemented. If that plan is not sufficient, then the evacuation reverts to the Emergency plan. The PACE method is an effective tool that can be applied to evacuations to aid in considering alternatives that afford flexibility through redundant contingencies. The plan provides the following:

Primary: This is the overall preferred plan of action to use based on the most likely and most damaging scenario resulting from hazard analysis.

Alternate: The Alternate plan should, when feasible, be as viable as the Primary plan. Alternate plans are needed because unforeseen circumstances arise during emergency evacuations.

> Developing the Alternate plan includes analyzing the most likely problems that could cause the Primary plan to fail and then come up with a plan that fits with the situation that won't be affected

by those problems. Whenever possible, come up with a few to several vulnerabilities in the Primary plan and find an alternate that's just as good but covers all those bases.

Contingency: The contingency evacuation plan is the action that will be implemented if you cannot implement either the Primary or the Alternate action due to compromised safety. The contingency isn't always (or isn't usually) as preferred as the others but is a viable option that doesn't rely on the same actions as the Primary and Alternate.

Emergency: This is the action that is implemented if all three of the previous actions fail. In some respects, it is a last resort that is the least preferred option, but is a viable and safe option, nonetheless. The goal is to utilize an emergency plan that's independent from reliance on the types of actions in the first three options, is a flexible plan, has the highest probability of succeeding, and offers a reliable option with little potential for compromise.

An emergency plan may not be the most convenient or preferred plan and may include components that are uncomfortable to occupants of the Project, but it should be as foolproof as possible. Table 1, PACE Evacuation for the Beaumont Heights Project, provides the Project approach to contingency planning using the PACE method.

Table 1 PACE Evacuation Plan for the Beaumont Heights Project

Contingency	Project Approach
Primary	Project will evacuate via the primary evacuation route(s) after receiving evacuation notice utilizing the primary evacuation route(s) as directed by law enforcement/emergency managers. Project specific primary evacuation routes may include I-10, SR-79, SR-60, Beaumont Avenue, Cherry Valley Boulevard, Oak Valley Parkway and California Avenue.
Alternate	Project will follow evacuation instructions that may include an alternate plan to utilize secondary routes or to relocate to nearby urban areas based on congested traffic conditions. Notifications that this alternate plan is being implemented will be provided via the notification systems or on-site emergency personnel, media and social media.
Contingency	Due to primary and alternate options being compromised or undesirable, the contingency plan of evacuating smaller, highest vulnerability populations will be implemented. For the Project, this includes moving potentially exposed or vulnerable populations to nearby areas that may serve as Safe Refuge Areas during a wildland fire. Remaining populations will be instructed to remain in place in the Project structures. Depending on the nature of the emergency, the contingency option may not be available or safe.
Emergency	When the wildfire or other emergency dictates that off-site evacuation is not advised by the primary or alternate evacuation routes, and conditions are such that open air exposure would be unhealthy or unsafe, occupants of the Beaumont Heights Project will be directed to shelter in place. Sheltering in place is possible due to the construction materials and irrigated landscape that creates a fire hardened development, as well as the fuel modification zones (FMZs). Sheltering in place may also be the preferred option for other emergencies, e.g., active shooter, earthquake. Persons sheltering in place are advised to remain aware of the situation and move out of the building to a designated safe zone if directed to do so or otherwise necessitated.

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4 Evacuation Road Network

4.1 CEQA Significance Standards

The CEQA Guidelines establish the significance criteria that apply to an evaluation of a project's potentially significant impacts relative to wildfire related risks. Relevant to this WES and the Project, those criteria include whether a proposed Project would:

- Substantially impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires

As described in the Project's Draft Environmental Impact Report (DEIR), the other CEQA criteria related to potential wildfire related significant impacts do not apply to this analysis for a variety of reasons including, without limitations, the nature of the Project, its location and the improvements proposed for the Project.

Neither CEQA nor the City of Beaumont establishes a time-based threshold for evaluating the potential significance of project impacts with respect to the CEQA criteria quoted above. Public safety, not time, is the guiding consideration for evaluating impacts related to emergency evacuation. For purposes of promoting informed decision making, Sections 4.2 and 4.3 below including the results of evacuation time modeling performed under various scenarios with and without the Project as well as an analysis of those results. The following discloses differences in evacuation times for the Project and areas in the vicinity of the Project under certain of the scenarios. However, based the CEQA significance criteria, the modeling and analysis support the determination made in the Addendum that evacuation traffic generated by the Project does not qualify as a significant adverse impact as the Project would not (i) impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; (ii) expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires; or (iii) substantially impair an adopted emergency response plan or emergency evacuation plan.

4.2 Wildfire Evacuation

Wildfire poses an evolving threat to lives and property in an increasing number of communities across the United States (FEMA 2012). While wildfires are a natural part of California's landscape, the fire season in California is starting earlier and ending later each year. According to CAL FIRE records, the largest fires in the state occurred in 2020 and 2021, while the deadliest and most destructive wildfire prior to 2025 was the Camp Fire in 2018, which destroyed approximately 18,804 structures, damaged 754 other structures, and resulted in approximately 85 civilian fatalities. More recently, the Eaton Fire and Palisades Fire in 2025 were among the most destructive in California's history. The Eaton Fire[1] destroyed approximately 9,414 structures, damaged an additional 1,074, and caused 19 civilian fatalities, while the Palisades Fire[2] destroyed approximately 6,837 structures, damaged an additional 973, and resulted in 12 civilian fatalities (CAL FIRE, 2025).The size and intensity of these wildfires, fueled

1 https://www.fire.ca.gov/incidents/2025/1/7/eaton-fire
2 https://www.fire.ca.gov/incidents/2025/1/7/palisades-fire

by drought, an unprecedented buildup of dry vegetation and extreme winds, caused the loss of more than 100 lives, destroyed thousands of homes and exposed millions of urban and rural Californians to unhealthy air.. Climate change is considered a key driver of this trend. In Beaumont, longer and warmer spring and summer seasons coincide with Santa Ana wind events, creating drier conditions and making vegetation and forests more susceptible to severe wildfire. The length of fire season is estimated to have increased by 75 days across the Sierras and seems to correspond with an increase in the extent of forest fires across the state (CAL FIRE, 2020).

These large and increasingly destructive wildfires have forced many Californians living or working in the WUI to evacuate when an encroaching wildfire threatens their community. The following provides a summary of the Project's wildfire risk.

The historical fire record shows that most vegetation fires occur during normal, onshore weather conditions, and that such fires account for only a proportionally small amount of the land area burned. Wildfires that occur on normal, non-extreme weather days behave in a much less aggressive manner and pose fewer dangers to life and property because they include less aggressive fire behavior and are easier to control. Terrain and fuel are typically the wildfire drivers. During these non-extreme weather days, vegetation is much more difficult to ignite and does not spread fire as rapidly. While there can be on-shore wind conditions that lead to more aggressive fire behavior, generally in these normal weather situations, firefighters have a very high success rate of controlling fires and keeping them under 10 acres.

Conversely, a small number of wildfires that occur during extreme fire weather (Red Flag or Santa Ana conditions) account for most of the land area burned. The data highlights that the most dangerous fire conditions are those related to a fire that moves rapidly due to high winds and low humidity, whereas under normal conditions fires are likely to be controlled with no evacuation or possibly limited extent, focused evacuations.

Project Wildfire Risk

Fire history is an important component of understanding the potential fire risk for the Project. Fire history data provides valuable information regarding fire spread, fire frequency, ignition sources, and vegetation/fuel mosaics across a given landscape. One important use for this information is as a tool for pre-planning. It is advantageous to know which areas may have burned recently and therefore may provide a tactical defense position, what type of fire burned in the vicinity of the Project site, and how a fire may spread.

Fire history data is available through the California Department of Forestry and Fire Protection's (CAL FIRE) Fire and Resource Assessment Program (FRAP) database.

According to available data from the CAL FIRE in the FRAP database, 97 wildfires have burned within a 5-mile radius of the Beaumont Heights Project site since the beginning of the historical fire data record. Recorded wildfires within 5 miles of the project site range in size from approximately 10 acres up to approximately 40,176 acres (2006 Esperanza Fire), however, the average wildland fire size is approximately 3,113 acres. The 2006 Esperanza Fire was driven by a Santa Ana wind event characterized by higher temperatures, low humidity, and strong off-shore wind gusts. Wildfires occurring during Santa Ana wind events can be larger and burn at a higher intensity than those under average conditions due to accelerated fire spread and the long-distance transport of embers that ignite spot fires.

Approximately 11 fires have burned onto a portion of the Project site. The 2023 Rabbit Fire is the most recent fire, which burned approximately 8,355 acres. RCFD may have data regarding smaller fires (less than 10 acres) that have occurred on the site that have not been included herein.

In addition to the fire history discussed above, it is important to note that the 2023 Rabbit Fire —fueled by excessive summer heat and low relative humidity, but not by Santa Ana winds, burned approximately 8,355 acres, including approximately 30.39 acres of the Project site. There was no loss of life or damaged or lost structures as a result of the fire. The Rabbit Fire resulted in both evacuation warnings and orders for nearby populations. Given the location of the Project in a VHFHSZ, the fire safety features, which are discussed further in the Project's FPP (Dudek 2025), include compliance with ignition resistant construction and defensible space requirements that will provide an additional buffer to the land uses to the east and north, slowing the rate of spread; therefore, providing a safer evacuation corridor.

Targeted Evacuations

As evidenced by historical mass evacuations in Riverside County and throughout Southern California, even with roadways that are designed to the applicable requirements, it may not be possible, or even the best response, to move large numbers of persons at the same time as part of a mass-evacuation. Instead, informed, phased or targeted evacuations enable more streamlined evacuations where those at highest risk are moved first.

Oftentimes during an evacuation, populations will be evacuated in "zones". Evacuation zones are areas of land with defined boundaries, that are then named and used when determining evacuation orders for clear and efficient evacuations. The City and County utilize Genasys Protect to determine their evacuation zones. A complete map of evacuation zones can be found at the following link:

https://protect.genasys.com/search?z=12.525966929903415&latlon=33.90205753153582%2C-116.95882964923362

The jurisdictions in Riverside County have developed distinct evacuation zones, and performed pre-planning, and tiered or targeted and staggered evacuation strategies to evacuation effectiveness. The Project Site is identified by the zone RVC-0643 in Genasys Protect.

In a wildland fire event, the adjacent evacuation zones and the Project site have multiple evacuation routes available. While the Project site is accessed from SR-79 and California Avenue, once occupants exit the site during an evacuation and enter the local road network, additional routes such as I-10, Beaumont Avenue, East 6th Street, and Oak Valley Parkway can be utilized. If an evacuation order is issued, evacuees are likely to be directed north and westward utilizing major transportation corridors (i.e., I-10, SR-79 and/or SR-60), away from at-risk areas. Available evacuation routes are identified on Figure 4, Evacuation Routes and Study Areas.

Targeted evacuation, which typically targets the scope of the evacuation to only the area in immediate danger and placing a larger area on standby for evacuation, has replaced mass evacuation as the standard protocol for conducting evacuations. This practice allows for better evacuation operations, reduces gridlock, and reserves sufficient travel way for emergency vehicles.

Target evacuations are possible due to technological advancements and improved evacuation strategies that were learned from prior wildfire evacuation events. This improved approach is reflected in EOPs and the experience of the people tasked with coordinating emergency events and is many times more capable of managing evacuations. With the technology in use today (i.e., Alert RivCo, B-Alert, and Wireless Emergency Alerts), evacuations are more strategic and surgical than in the past, evacuating smaller areas at highest risk and phasing evacuation traffic so that it flows more evenly and minimizes the surges that may slow an evacuation. Mass evacuation scenarios where

large populations are all directed to leave simultaneously, resulting in traffic delays, are thereby avoided, and those populations most at risk safely evacuate.

Fire Department Responsibilities

- Establish command of the Incident
- Conduct a situation assessment and evaluate the need for evacuations
- Establish an Incident Command Post (ICP) with sufficient room for representatives from other assisting agencies and announce its location
- Request Agency Representative from Law Enforcement to respond to the ICP.

Law Enforcement Responsibilities

- Assign supervisor of the rank of Sergeant or above to the Incident Command Post and request a Deputy to locate with Operations Section Chief
- Maintain ingress and egress routes for emergency vehicles
- Establish perimeter control, keeping unauthorized vehicles and pedestrians out of the involved area. Conduct evaluations, if required, at the direction of the Incident Commander
- Establish anti-looting security patrols, when safe to do so, for evacuated areas within the perimeter
- Maintain a Unit log

Joint Fire and Law Enforcement Responsibilities

- Evaluate and determine whether Law Enforcement role will be as an Agency Representative or Unified Incident Commander, depending on the scope of the Incident
- Assign a Law Enforcement supervisor to work closely with the Operations Section Chief or Incident Commander, whomever is determining the areas to be evacuated
- Assess and validate the need for an Evacuation Warning, Evacuation Order, and/or Shelter in Place — Determine the location, potential size, and direction of Incident travel or spread
- Unified Commanders determine potential for Incident spread and request the appropriate resources to complete the evacuation and mitigate the Incident concurrently

When the IC deems certain areas at risk due to fire conditions, an evacuation order is issued. An evacuation order requires the movement of community members out of a defined area due to an immediate threat to life and property from an emergency incident. An evacuation order should be used when there is a potential for or an actual threat to civilian life, within 1 to 2 hours of such determination or when the IC deems it necessary to protect civilians. The purpose of an evacuation warning, in comparison, is to alert community members in a defined area of a potential threat to life and property from an emergency incident. An evacuation warning may be issued when the potential or actual threat to civilian life is more than 2 hours away.

The Department of Homeland Security (2019) provides supporting data for why jurisdictions have moved to the targeted evacuation approach that leverages the power of situational awareness to support decision making. According to their Planning Considerations: Evacuation and Shelter in Place document, they indicate that delineated zones provide benefits to the agencies and community members. Evacuation and shelter-in-place zones promote phased, zone-based evacuation targeted to the most vulnerable areas, which allows jurisdictions to prioritize

evacuation orders to the most vulnerable zones first and limit the need to evacuate large areas not under the threat. Zones help:

- Jurisdictions to understand transportation network throughput and capacity, critical transportation and resource needs, estimated evacuation clearance times, and shelter demand.
- Planners to develop planning factors and assumptions to inform goals and objectives.
- Community members to understand protective actions to take during an emergency.
- Shelters to limit traffic congestion and select locations suitable for the evacuated population.

Additionally, targeted evacuation order/warning aims to ensure proper traffic flow and reduce stress at evacuation sites, some people may still choose to evacuate even if they are not facing an immediate threat. These individuals are known as shadow evacuees, and they increase the demand on the roadway network. The number of shadow evacuees varies from incident to incident, depending on their proximity to the actual fire. The evacuation modeling analysis, in all the Scenarios described below, conservatively assumes the evacuation of all populations within the RVC-0643 evacuation zone, including shadow evacuees.

While the amount of time needed to evacuate the Project would vary by the type of incident, the number of evacuation routes utilized, the amount of mobilization time taken by occupants, actual areas at risk, and other factors, the targeted approach would minimize the size of the area being evacuated.

Shelter In Place

As discussed previously in Section 2.4.4, shelter-in-place is the practice of going or remaining indoors during or following an emergency event. This procedure is recommended if there is little time for the public to react to an incident and when it is safer for the public to stay indoors for a short time rather than travel outdoors. Sheltering-in-place also has many advantages because it can be implemented immediately, allowing people to remain in their familiar surroundings and providing individuals with everyday necessities such as telephone, radio, television, food, and clothing. However, the amount of time people can stay sheltered-in-place is dependent upon availability of food, water, medical care, utilities, and access to accurate and reliable information

All Project structures will be required to meet or exceed the requirements for building in a FHSZ (e.g., Chapter 5 of the CWUIC, formerly Chapter 7A of the CBC), which establishes minimum standards for ignition resistant construction and defensible space. In the event of an ignition in the adjacent open space surrounding the Project site, Project occupants may be directed to evacuate to the I-10, SR-79 or directed to shelter in place on site.

The Project buildings will be constructed of concrete which is non-combustible and highly resistant to heat. Because of the concrete/ignition resistant construction, fuel modification zone setbacks and the type of lower fire intensity vegetative fuels in the vicinity of the site, sheltering in place is considered to be a safe option if a fast-moving wildfire precludes complete evacuation of the Project site. As Described in the Project's FPP, while there is potential for vehicles including 18-wheelers to be parked within this setback, embers are unlikely to have sufficient thermal output to ignite the largely non-combustible vehicles under ordinary conditions and the lack of vegetative fuels in the setbacks eliminates the "ladder" that would otherwise allow embers to ignite fine combustible vegetation, which could then spread to thicker vegetation, and ultimately the vehicles. The primary concern is anticipated to be with smoke and air quality rather than exposure to flames and heated air.

Sheltering In Place has been deemed a safe approach to surviving a wildfire threat by CAL FIRE, RCFD, and other emergency response agencies throughout California. If directed by BPD to shelter in place, occupants of the Project would be deemed safe to stay in those "fire-hardened" buildings with the windows and doors closed. Sheltering in place would provide guests and staff protection from the wildfire threat, through the enhanced construction features and the proposed 200 feet of defensible space that would reduce available fuels nearest Project structures.

4.3 Evacuation Modeling

An evacuation model analysis was performed by CRA Traffic Engineers for the Project to determine how long it would take for occupants of the Project and the other land uses in the study area (Figure 4, Evacuation Areas and Evacuation Routes) to evacuate to nearby urban areas and/or freeways in case of a fire emergency.

This evacuation analysis was performed for the Project to determine approximately how long it would take for employees/visitors/residents of the Project and of the surrounding community to evacuate to nearby urban areas in case of a fire emergency. Current evacuation practice typically targets the scope of the evacuation only to the area in immediate danger. Targeting the area in immediate danger allows for better evacuation operations, reduces gridlock, and reserves sufficient travel way for emergency vehicles. This analysis was performed in accordance with the requirements of the City and County OA EOP.

As a conservative approach, the following analysis assumes the entire study area (Area A through Area G with and without the Project) evacuating at one time, rather than a target or phased evacuation. As previously stated, there are multiple evacuation routes out of this evacuation zone; therefore, to determine impacts to existing land uses, the model considers evacuation traffic from Area A through Area G and the Project site.

4.3.1 Evacuation Modeling Methodology, Assumptions, and Scenarios

The following provides a summary of the methodology, assumptions and scenarios considered in the evacuation time analysis presented herein.

Evacuation Modeling Methodology

To analyze evacuation events, CR Associates (CRA) utilized PTV Vissim, a widely recognized microscopic, multimodal traffic simulation software, to model and assess evacuation scenarios. Vissim has been widely used in evacuation and emergency planning research and real-world applications.

Vissim is capable of simulating detailed traffic operations by representing each individual vehicle and driver in the network, allowing for nuanced modeling of complex behaviors such as lane changing, acceleration, and gap acceptance, all of which are critical to realistic evacuation analysis. In these simulations, Vissim accounts for roadway capacity constraints and dynamically tracks every vehicle's movements at 0.1-second intervals, providing a high-resolution dataset for measures of effectiveness such as average vehicle speed, queue lengths, travel times, and congestion hotspots.

This modeling approach enables the simulation to capture the unique traffic dynamics that often emerge during mass evacuations, including increased driver stress, atypical routing decisions, and changes in flow

rates. For this study, a total of 20 simulation runs were performed to generate a robust statistical sample and ensure reliability in the results, allowing for assessment of both average conditions and the variability in outcomes during evacuation events.

To determine evacuation times, all vehicles simulated under each scenario were recorded, including start times from an origin zone, and end times at a destination zone. An evacuating vehicle is removed from the traffic network, and its time stamp recorded once it passes through a destination zone. It is assumed once a vehicle merges onto the freeway at I-10 or Downtown Beaumont, it is within a safe area. Evacuation time results are averaged in this report to provide a representative analysis of simulations. A summary of the simulation runs is provided in Appendix C.

Evacuation Modeling Assumptions

It is assumed that the proposed Project's evacuation plan would provide clear instructions for response once an evacuation order is issued. Employees are expected to evacuate using their personal vehicles, while operators of heavy vehicles would depart using their tractor units with a single trailer attached. Additionally, it is assumed that law enforcement would restrict all inbound traffic once an evacuation order is in effect.

Note that while some households may leave the area prior to an evacuation order for personal reasons, for a conservative analysis, all scenarios presented here are based on the presumption that all the households and vehicles would leave together once an evacuation order is issued.

The prevailing wind patterns in Beaumont are predominantly westerly or northwesterly, as documented by WeatherSpark[3] and regional wind studies[4]. These winds are channeled through the San Gorgonio Pass for most of the year, making them the typical wind direction experienced in the area. Under a westerly wind scenario, a fire originating to the west would primarily threaten areas west of the Project site, such as Area E and Area G, and might not necessitate evacuation of areas to the east, such as Area A and Area B. Nonetheless, to ensure a conservative and comprehensive analysis, it is assumed that Areas A through G, as well as the Project site, would evacuate simultaneously under all scenarios.

While it is feasible for a wildfire to originate to the north or northeast of the Project site, these areas are predominantly urbanized and characterized by a dense, grid-like roadway network and higher population density. Such conditions generally allow for faster fire detection, quicker emergency response, and more immediate access for firefighting equipment, thereby reducing the likelihood that a fire would grow to a scale requiring evacuation of the Project site. Although a scenario in which a fire originates to the north or northeast and is subsequently driven southward by Santa Ana wind conditions cannot be entirely discounted, the probability of such an event resulting in a large-scale evacuation is considered lower than that of a fire originating in the more rugged WUI areas with fewer opportunities for early intervention because of the lack of exposure to wildlands to the northeast. The evacuation analysis presented herein assumes a southerly wind pattern, meaning wind blowing from south to north. Although this wind direction is relatively uncommon in Beaumont, it represents the scenario most likely to require a full evacuation of the Project site and adjacent areas, as it would drive fire toward the developed properties to the north. This assumption was informed by a review of historical wildfire perimeter data from the CAL FIRE Historical Wildland Fire Perimeters[5] database and the Interagency Wildland Fire Perimeter History[6] dataset. These datasets indicate that wildfires with large footprints that have necessitated

[3] https://weatherspark.com/y/2098/Average-Weather-in-Beaumont-California-United-States-Year-Round
[4] https://www.markgps.com/palm-springs-wind-map.html
[5] https://www.arcgis.com/home/item.html?id=c3c10388e3b24cec8a954ba10458039d
[5] https://data-nifc.opendata.arcgis.com/datasets/nifc::interagencyfireperimeterhistory-all-years-view/explore?location=33.917551%2C-116.976151%2C12.41

mass evacuations in and around the City of Beaumont have historically originated within the wildland–urban interface (WUI) areas to the south and southwest of the City. These areas are generally characterized by rugged terrain, heavier fuel loads, limited roadway access, and longer detection and response times. As a result, fires originating in these areas have a greater potential to grow rapidly before firefighting resources can intervene, increasing the likelihood of widespread evacuations.

This evacuation analysis is based on a conservative assumption of building square footage that exceeds the currently proposed development area. A comparison of the assumed and proposed square footage is provided in Table 2.

Table 2. Comparison of Studied Project Details to September 2025 Site Plan

Building	Studied (SF)	September 2025 Project Site Plan (SF)	Δ Site Plan (SF)
1	688,200	636,937	51,263
2	1,488,600	1,386,044	102,556
3	1,675,600	1,488,920	226,680
4	1,847,600	1,666,305	181,295

Evacuation Modeling Scenarios

All scenarios assume a mass evacuation event in which all vehicles leave the study area simultaneously. The evacuation analysis in this report evaluates five scenarios: (1) Existing (2024) Conditions, (2) Background (2030) Conditions, (3) Background (2030 – Phase 1 through Phase 3) With Project Conditions, (4) Cumulative No Project Conditions (2045), and (5) Cumulative With Project Conditions (2045 – Project Buildout). Scenarios 1, 2, and 4 represent total evacuating vehicles and evacuation times under "without Project" conditions, while Scenarios 3 and 5 address the "with Project" conditions.

In all scenarios, it is assumed that a wildfire originates south of the study area, where vegetation is dense, prompting all evacuating vehicles to travel north toward I-10 and Downtown Beaumont. The analysis area was defined to capture the potential for evacuating vehicles from surrounding land uses to utilize the same or adjacent evacuation routes as the Project. Although the primary evacuation route for the Project is SR-79/Beaumont Avenue, it is likely that some evacuating traffic from land uses to the west and east could also rely on this roadway to reach I-10 and Downtown Beaumont. To ensure a conservative analysis, the study area encompasses all potential evacuation zones, including some with access to alternative routes.

For analytical clarity, land uses within the study area are further grouped into "evacuation areas," labeled Area A through Area G, displayed on Figure 5, Evacuation Areas. These groupings reflect shared evacuation routes and/or common destinations. For example, Area A includes industrial and certain residential uses that would, during an evacuation, use either Pennsylvania Avenue or SR-79/Beaumont Avenue to reach I-10 and Downtown Beaumont. In contrast, Area B primarily consists of residential uses likely to use Pennsylvania Avenue and South Highland Springs Avenue. Certain sites, such as the Sunlakes Village Shopping Center, were excluded from the analysis, as their evacuation routes do not overlap with those of the Project, and their limited surrounding vegetation makes them less vulnerable. This does not preclude the possibility that such areas could face an evacuation order under different fire scenarios; however, if a fire is located south of the Project site, it is more likely that Incident Command would prioritize evacuation of land uses in closest proximity to the fire.

Evacuation Routes

The analysis presented here selects a reasonable evacuation route for the extreme weather scenario and a fire traveling from south to north. In each scenario, the evacuation areas are expected to use local roads and SR-79 to reach I-10 and Downtown Beaumont. Detailed evacuation analysis information is provided in Attachment B of Appendix C.

No contraflow lanes were utilized to provide additional evacuation capacity under the analysis. Contraflow or lane reversal involves reversing the usual flow of one or more lanes to serve additional outbound evacuation traffic, increasing outbound traffic capacity to move people away from the wildfire or other hazard. Such a strategy can be used to eliminate bottlenecks in communities with road geometrics that prevent efficient evacuations or to otherwise hasten and facilitate traffic flow. However, among the considerations in planning emergency contraflow are whether sufficient traffic control officers are available, potential negative impact on responding fire apparatus, access management, merging, exiting, safety concerns, and labor requirements.[7] None of the evacuation scenarios analyzed here assumed contraflow traffic flow would be implemented; instead, two-way travel flow was utilized, with evacuating vehicles traveling outbound to the Safe Zone, and inbound lanes assumed to be reserved for use by first responders, law enforcement, and fire fighters. Based on recent practice, it is reasonably assumed that first responders or law enforcement will direct traffic at all major intersections during the evacuation process. Should evacuation managers determine that contraflow is preferred or necessary in the context of an actual wildfire event, contraflow remains a tool in the evacuation manager's toolbelt that would increase evacuation capacity and decrease evacuation times.

Figure 4, Evacuation Routes, illustrates the routes available to occupants of the Project site, while Figure 5, Evacuation Areas, identifies the evacuation zones that may potentially evacuate simultaneously with the Project site.

Evacuation Population

As the Project is an industrial development and the surrounding study area consists of a mix of undeveloped and residential land uses, this analysis assumes a weekend (Saturday afternoon) evacuation event when the Project is operating at full capacity and all residents of adjacent communities are at home, and nearby industrial and retail land uses are fully active at the moment the evacuation order is issued. The number of vehicles are estimated in Table 3, Project and Surrounding Communities Evacuating Vehicles, to both provide a conservative assessment of evacuating populations while also avoiding double-counting of evacuating populations where feasible. Figure 4 includes the locations and surrounding existing and future developments included in this analysis.

Table 3: Project and Surrounding Communities Evacuating Vehicles

Scenario	Number of Evacuating Vehicles by Area[1]								Total
	A	B	C	D	E	F	G	Project	
Scenario 1: Existing (2024) Conditions	632	7,812	25	86	1,008	567	5,052	N/A	15,182
Scenario 2: Background (2030) Conditions	1,156	8,124	26	89	1,048	588	5,256	N/A	16,287

[7] Dudek July 2014. "Wildland Fire Evacuation Procedures Analysis" for City of Santa Barbara, California, page 65.

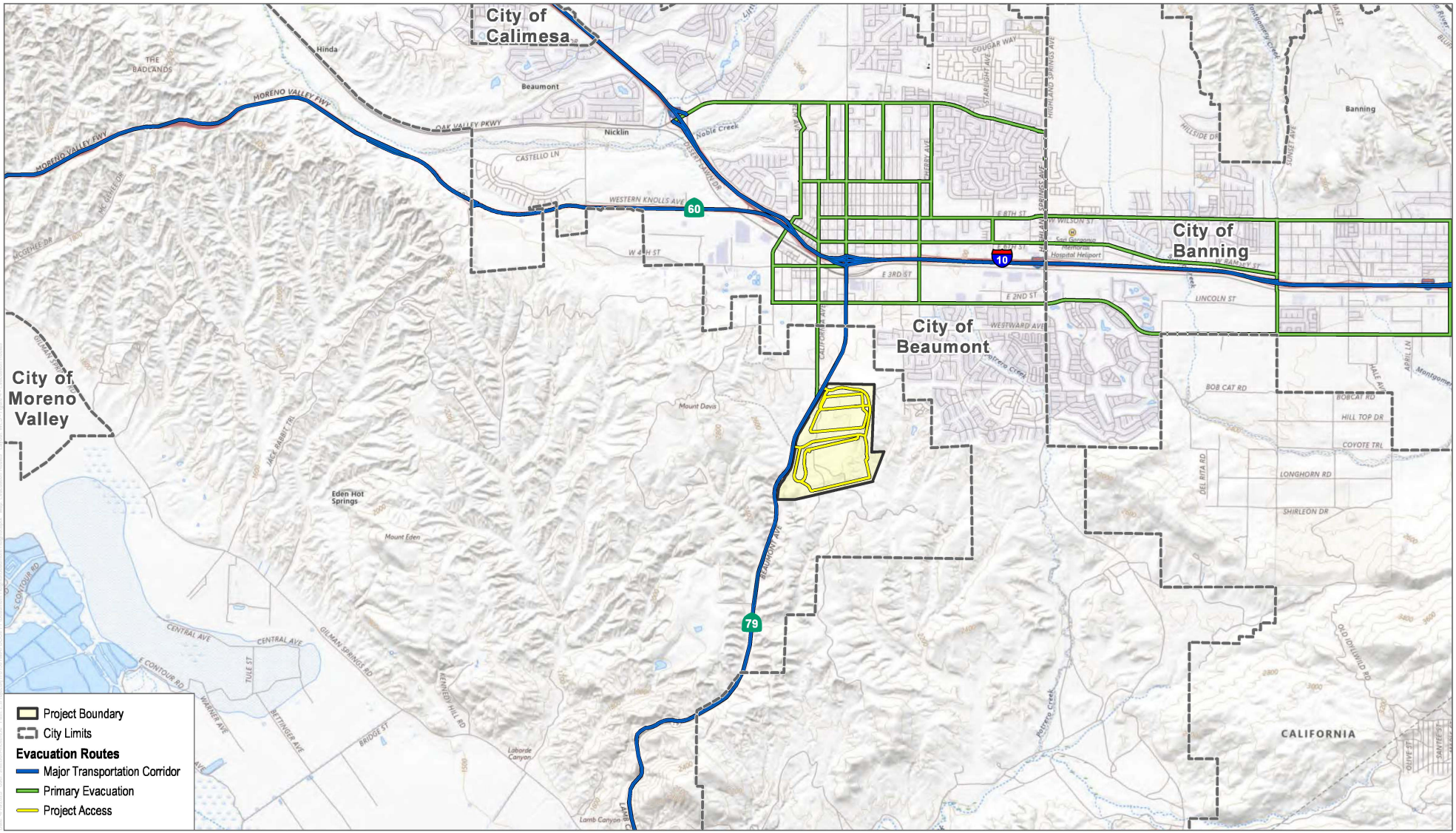
Table 3: Project and Surrounding Communities Evacuating Vehicles

Scenario	Number of Evacuating Vehicles by Area[1]								Total
	A	B	C	D	E	F	G	Project	
Scenario 3: Background (2030 – Phase 1 through Phase 3) With Project Conditions	1,156	8,124	26	89	1,048	588	5,256	2,584	18,871
Scenario 4: Cumulative No Project Conditions (2045)	1,334	9,372	30	103	1,210	678	6,064	N/A	18,791
Scenario 5: Cumulative With Project Conditions (2045 – Project Buildout)	1,334	9,372	30	103	1,210	678	6,064	3,822	22,613

Source: CR Associates (2024), US Census Bureau (2022), Google Maps (2022).
Notes:

[1] Average Vehicle Ownership Assumptions: The number of vehicles evacuating under each scenario was calculated based on published industry sources, including the American Community Survey, the Institute of Transportation Engineers (ITE) Parking Generation Manual, and City of Beaumont vehicle ownership statistics. For residential land uses, the total number of evacuating vehicles was determined by multiplying the average vehicle ownership rate for the City of Beaumont, which is 2.2 vehicles per household, by the number of households within each evacuation area. This calculation also accounts for specialized residential uses such as RV parks, where it is assumed that, in addition to the RVs parked onsite, there would be supplementary vehicles present, and that the RV parks would be at full occupancy during an evacuation event.
For industrial and commercial land uses, the number of evacuating vehicles was estimated by multiplying the total building square footage by the applicable average parking rate from the ITE Parking Generation Manual. It is assumed that all parked vehicles would evacuate in response to an evacuation order, resulting in a conservative estimate. Additionally, the proportion of heavy vehicles used in the analysis is consistent with the assumptions from the Traffic Analysis, which indicate that between 4 percent and 5 percent of vehicles in industrial areas are heavy vehicles. This is higher than the standard heavy vehicle percentage of 2 percent, which further reinforces the conservative nature of the analysis.

Except for Scenario 1, all other scenarios incorporate cumulative projects. These cumulative projects represent anticipated developments or land use changes expected to occur by the corresponding analysis years. For the purpose of the evacuation analysis, cumulative projects located within the same evacuation area or in adjacent areas were included, or partially included, in the calculation of total evacuating vehicles. The inclusion of each cumulative project was determined based on its proximity to the study area and the specific evacuation routes available to it. If a cumulative project was situated such that it had access to evacuation routes outside the study area, only a proportional share of its evacuating vehicles was included in the analysis. This approach ensures that the evacuation vehicle totals accurately reflect the potential demand on the primary evacuation routes being analyzed, while avoiding overestimating vehicles that may utilize alternative routes. The detailed calculation of evacuating vehicles for each study area is included in Attachment A of Appendix C.



SOURCE: USGS National Map; Riverside County 2024;

DUDEK

FIGURE 4

Evacuation Routes

Beaumont Heights Wildfire Evacuation Study

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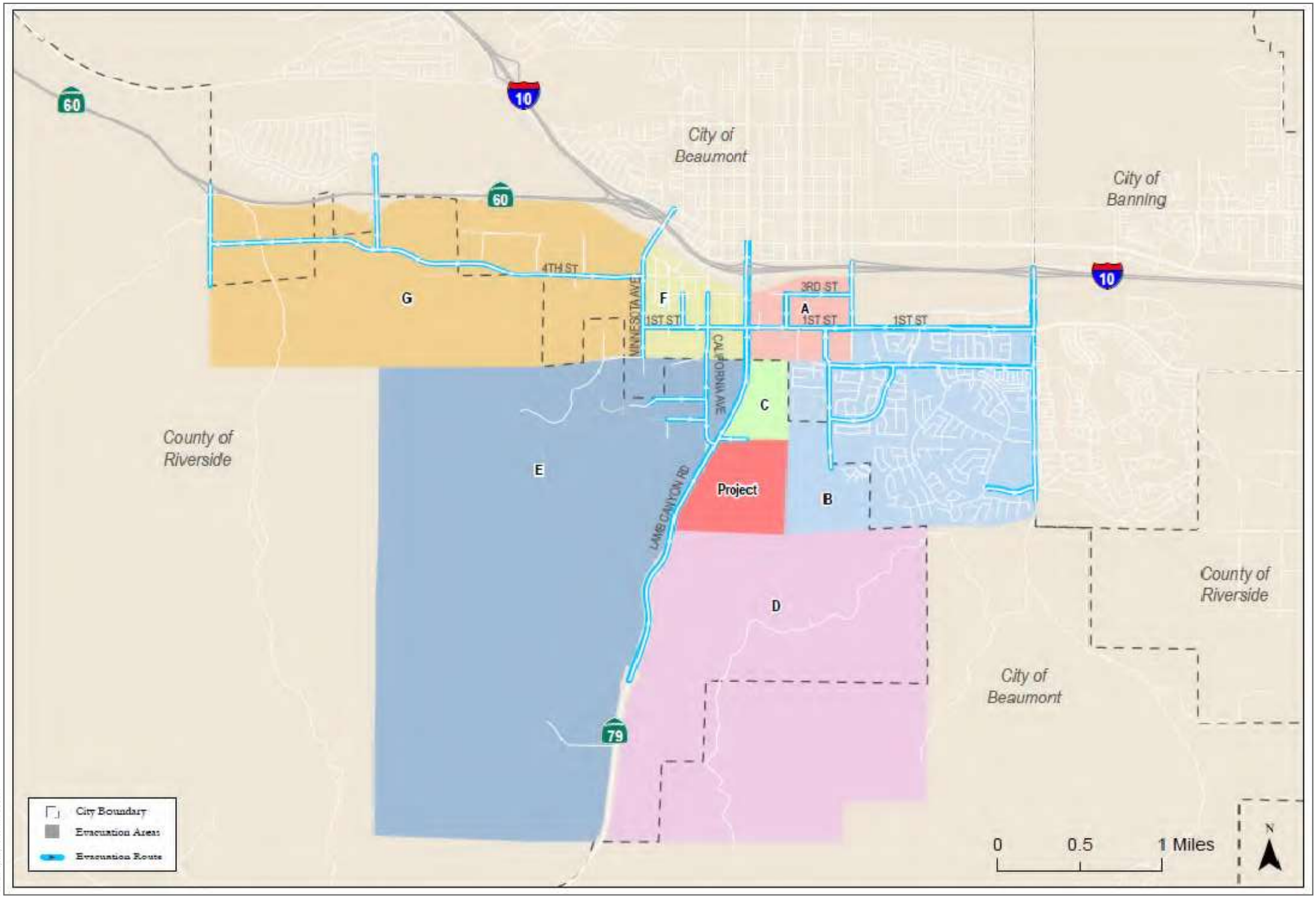

SOURCE: CR Associates, 2025

FIGURE 5

Evacuation Areas

Beaumont Heights Wildfire Evacuation Study

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4.3.2 Modeling Results

Based on the analysis methodology described in the previous section, Table 4, Evacuation Modeling Scenarios and Evacuation Time Summary, summarizes the evacuation time for each analysis scenario. The evacuation time does not depict the evacuation time for each individual person within an evacuation area, but rather the total amount of time needed to evacuate all populations modeled from an area. Populations located in closer proximity to the IC designated safe zone will safely evacuate sooner than the total calculated evacuation time identified in Table 4. Detailed evacuation travel time analysis information is provided in Appendix C, Evacuation Modeling Technical Memorandum.

As shown below, in Table 4, the following is a summary of the evacuation time for each scenario:

Scenario 1 - Existing (2024) Conditions

Scenario 1 represents existing (2024) conditions, with an estimated 15,182 vehicles requiring evacuation. Under these conditions, evacuation times for each area are as follows: Area A evacuates in 29 minutes, Area B in 2 hours and 23 minutes, Area C in 49 minutes, Area D in 48 minutes, Area E in 1 hour and 8 minutes, Area F in 54 minutes, Area G in 1 hour and 35 minutes, and there is no Project component in this scenario.

Scenario 2 - Background (2030) Conditions

Scenario 2 reflects background (2030) conditions, accounting for anticipated growth and an increase in evacuating vehicles to 16,287. As a result, evacuation times increase in some areas: Area A takes 53 minutes, Area B takes 3 hours and 18 minutes, Area C takes 47 minutes, Area D takes 46 minutes, Area E takes 48 minutes, Area F takes 54 minutes, Area G takes 3 hours and 32 minutes, and the Project area is not yet included in this scenario.

Scenario 3 - Background (2030 – Phase 1 through Phase 3) With Project Conditions

Scenario 3 introduces the proposed Project, evaluating background (2030) conditions with Phases 1 through 3, resulting in 18,871 vehicles requiring evacuation. In this scenario, evacuation times are 53 minutes for Area A, 3 hours and 18 minutes for Area B, 49 minutes for Area C, 1 hour and 8 minutes for Area D, 1 hour and 20 minutes for Area E, 58 minutes for Area F, 3 hours and 36 minutes for Area G, and 3 hours and 45 minutes for the Project area. Compared to Scenario 2, the addition of the Project results in incremental increases in evacuation times, most notably 22 minutes longer for Area D, 32 minutes for Area E, 4 minutes for Areas F and G, and 3 hours and 45 minutes added for the Project itself.

Scenario 4 - Cumulative No Project Conditions (2045)

Scenario 4 evaluates cumulative (2045) conditions without the Project, with a total of 18,791 vehicles. Under this scenario, evacuation times are 1 hour and 4 minutes for Area A, 3 hours and 49 minutes for Area B, 52 minutes for Area C, 52 minutes for Area D, 54 minutes for Area E, 1 hour and 1 minute for Area F, and 4 hours and 7 minutes for Area G. The Project area is not included in this scenario.

Scenario 5 - Cumulative With Project Conditions (2045 – Project Buildout)

Scenario 5 examines cumulative (2045) conditions with full Project buildout, resulting in 22,613 vehicles requiring evacuation. Evacuation times increase to 1 hour and 4 minutes for Area A, 3 hours and 52 minutes for Area B, 53 minutes for Area C, 1 hour and 23 minutes for Area D, 1 hour and 37 minutes for Area E, 1 hour and 8 minutes for

Area F, 4 hours and 11 minutes for Area G, and 4 hours and 33 minutes for the Project area. Compared to Scenario 4, the addition of the Project results in evacuation time increases of 3 minutes for Area B, 1 minute for Area C, 31 minutes for Area D, 43 minutes for Area E, 7 minutes for Area F, and 4 minutes for Area G, with a total evacuation time of 4 hours and 33 minutes for the Project area.

Table 5. Evacuation Modeling Scenarios and Evacuation Time Summary

Scenario	# Vehicles	Evacuation Time (Hours: Minutes)							
		A	B	C	D	E	F	G	Project
Scenario 1 – Existing (2024) Conditions	15,182	0:29	2:23	0:49	0:48	1:08	0:54	1:35	N/A
Scenario 2 - Background (2030) Conditions	16,287	0:53	3:18	0:47	0:46	0:48	0:54	3:32	N/A
Scenario 3 - Background (2030 – Phase 1 through Phase 3) With Project Conditions	18,871	0:53	3:18	0:49	1:08	1:20	0:58	3:36	3:45
Δ Evacuation Time (Scenario 3 – Scenario 2)	N/A	0:00	0:00	0:02	0:22	0:32	0:04	0:04	3:45
Scenario 4 - Cumulative No Project Conditions (2045)	18,791	1:04	3:49	0:52	0:52	0:54	1:01	4:07	N/A
Scenario 5 - Cumulative With Project Conditions (2045 – Project Buildout)	22,613	1:04	3:52	0:53	1:23	1:37	1:08	4:11	4:33
Δ Evacuation Time (Scenario 5 – Scenario 4)	N/A	0:00	0:03	0:01	0:31	0:43	0:07	0:04	4:33

Source: CR Associates (2024)
Notes:
1 00.00 = Maximum evacuation time for each scenario (time for last vehicle to leave the network and enter a safe area)
2 The evacuation analysis incorporates the same set of cumulative projects and roadway improvements as those evaluated in the traffic analysis. Given the uncertainty surrounding the timing of cumulative project development, it is conservatively assumed that all such projects will be fully built and occupied by the year 2030.

4.4 Potential for Project Evacuation Impacts

The evacuation modeling reflected an increase in evacuation times that ranged from zero to 32 minutes, with the greatest increase in evacuation time for Area E. The addition of the Project conditions to the background 2030 conditions increased Areas A, B, C, F, and G by less than 5 minutes. Similarly, when comparing evacuation times for the cumulative conditions, the increased time to evacuate ranged from zero minutes to 43 minutes. Area A reflected a zero-minute difference, Area C with an increase of 1 minute, Area B with 3 minutes, Area G with a 4-minute increase, and Area F with 7 minutes. The largest evacuation time increase was in Area D (31 minutes) and Area E (43 minutes). Many of the evacuation scenarios therefore reflecting an increase of less than 10 minutes, with the largest difference being 43 minutes.

There are currently no significant standards for evacuation travel time for the Project area or established in the CEQA Guidelines. Public safety, not time, is generally the guiding consideration for evaluating impacts related to emergency evacuation. The County considers a Project's impact on evacuation significant if the Project would significantly impair or physically interfere with implementation of an adopted emergency

response or evacuation plan; or if the Project would expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Safely undertaking large-scale evacuations may take several hours or more and require moving people long distances to designated areas. Further, evacuations are fluid and timeframes may vary widely depending on numerous factors, including, among other things, the number of vehicles evacuating, the road capacity to accommodate those vehicles, occupants' awareness and preparedness, evacuation messaging and direction, and on-site law enforcement control. As a large-scale evacuation may be executed in several hours, the maximum increase of 43 minutes for Area E under the cumulative with Project conditions, does not reflect a potentially unsafe condition.

Notwithstanding evacuation challenges and variables, Riverside County's success rate in safely managing both mass and targeted evacuations is largely due to the comprehensive pre-planning outlined in Emergency Support Function (ESF) 16, Evacuation and Re-Entry, of the County's EOP. ESF 16 provides detailed guidance to ensure evacuation, re-entry, or shelter-in-place operations prioritize the safety of evacuees, as well as domestic animals and livestock (County of Riverside, 2024). It identifies the lead and supporting agencies, their responsibilities, factors influencing evacuation decisions, the coordination process, notification protocols, and the hazards that may necessitate evacuation. ESF #16 is critical to ensuring the successful implementation of evacuation operations by providing clear guidance, defined roles, and coordinated processes that prioritize safety and efficiency.

For example, there were no fire-caused deaths during the evacuation of the Rabbit Fire in 2023 and losses of life in virtually every large wildfire were related to persons who ignored initial evacuation warnings, many of whom were located in rural areas with long, exposed evacuation routes. Technological advancements and improved evacuation strategies learned from prior wildfire evacuation events have resulted in a system that is many times more capable of managing evacuations. With the technology in use today in the City and County, evacuations are more strategic and surgical than in the past, evacuating smaller areas at highest risk and phasing evacuation traffic so that it flows more evenly and minimizes the surges that may slow an evacuation. Mass evacuation scenarios where large populations are all directed to leave simultaneously, resulting in traffic delays, are thereby avoided, and those populations most at risk safely evacuate. As implemented in past wildfire evacuations, an early evacuation of the area may occur several or more hours prior to actual threatening conditions at the Beaumont Heights Project site, depending on conditions and fire spread projections.

In an evacuation, the Project occupants would primarily utilize SR-79 and I-10, as illustrated in Figure 4 – Evacuation Routes. Based on the typical road capacity, an evacuation of the Project site and surrounding land uses, under worst-case conditions, would take approximately 4 hours and 33 minutes to evacuate. The Project has associated cumulative projects, given the uncertainty surrounding the timing of cumulative project development, it was conservatively assumed that all such projects will be fully built and occupied by the year 2030. Attachment A and B of Appendix C provides more information on the cumulative projects analyzed with the Beaumont Heights Project evacuation study. As discussed above, the Project would provide emergency managers the alternative option of recommending occupants to temporarily seek refuge on site in fire-resistant buildings or within the wide, converted landscapes and hardscapes that would not readily facilitate wildfire spread. This would provide emergency managers with a safer alternative to risking a late evacuation. Additionally, the Project would not cut off or otherwise modify existing evacuation routes. Considering these facts and others presented herein, the Project would not expose people to a significant risk of loss or death involving wildland fires related to evacuation, would not interfere with evacuation response planning, and would not result in inadequate emergency access.

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5 Wildfire/Evacuation Awareness

Although not required by regulation or code, nor relied upon for purposes of reaching the significance conclusions set forth in this WES, the Beaumont Heights Project can be proactive in its outreach to its occupants regarding fire safety, wildfire and evacuation awareness, and general evacuation procedures. Educating populations in FHSZ and WUI areas on wildfire safety and evacuation can make for an even more efficient and effective evacuation, such as understanding how to receive emergency notifications and the different types of notifications keeps occupants informed, what to include in your emergency kit for your home or vehicle keeps occupants ready to evacuate when notified, encouraging evacuees to carpool helps reduce the number of vehicles on evacuation roadways. Similarly, the Project can also coordinate with local fire agencies to engage occupants in fire safety and evacuation awareness through a variety of methods as described further below. Section 6, Recommend Mitigation, provides an outline for how the project could incorporate a wildfire evacuation preparedness program.

The focus of the "Ready, Set, Go!" program is on public awareness and preparedness, especially for those living and working in the WUI areas. The program is designed to incorporate the local fire protection agency as part of the training and education process in order to ensure that evacuation preparedness information is disseminated to those subject to the potential impact from a wildfire. There are three components to the program:

- **"READY" – Preparing for the Fire Threat:** Take personal responsibility and prepare long before the threat of a wildfire so you are ready when a wildfire occurs. Confirm you are registered for Wireless Evacuation Alerts, and Alert RivCo. Make sure all occupants have an individual Action Plan.
- **"SET" – Situational Awareness When a Fire Starts**: If a wildfire occurs and there is potential for it to threaten the Beaumont Heights Project and surrounding communities, pack your vehicle with your emergency items. Stay aware of the latest news from local media and your local fire department for updated information on the fire. If you are uncomfortable, leave the area.
- **"GO!" – Leave Early!** Following your Action Plan provides you with knowledge of the situation and how you will approach evacuation. Leaving early, well before a wildfire is threatening the area, provides you with the least delay and results in a situation where, if a majority of neighboring developments also leave early, firefighters are now able to better maneuver, protect and defend structures, evacuate other occupants who couldn't leave early, and focus on citizen safety.

"READY SET GO!" is predicated on the fact that being unprepared and attempting to flee an impending fire late (such as when the fire is physically close to your community) is dangerous and exacerbates an already confusing situation. This Beaumont Heights WES provides key information that can be integrated into the individual Action Plans, including the best available routes to use in the event of an emergency evacuation.

Situation awareness requires a reliable information source. The City of Beaumont utilizes Alert Rivco for its Community Emergency Notification System, and all employees and occupants should be encouraged to register for emergency alerts. Alert RivCo has the capability to send emergency notifications over both land lines as well as to cell phones and via text messages. It is up to individual employees to register their cell phones for AlertRivCo. The following provides examples of best practices for how the Project could proactively implement a wildfire and evacuation awareness program.

Beaumont Heights Project can identify a Fire Safety Coordinator that is responsible for:

I. Overseeing implementation of this WES and overall fire coordination with CAL FIRE, RCFD, and BPD.
II. Implementing a proactive facility wildfire education program utilizing a multi-pronged approach to fire safety following the "**Ready, Set, Go!"** approach to wildfire evacuation, to include, but not limited to:
    i. Annual wildfire and evacuation safety awareness meeting in coordination with local fire agencies.
    ii. Annual reminder notices will be provided to each employee encouraging them to review this WES and be familiar with evacuation protocols.
    iii. The Project website will host a webpage dedicated to wildfire and evacuation education and awareness, which should include a copy of this Wildfire Evacuation Study and the resources provided herein.
III. Coordinating an annual fire evacuation drill/ fire exercise to ensure proper safety measures have been implemented, facility awareness and preparation of a facility-wide **Ready, Set, Go!"** plan.
IV. Organizing an employee training and awareness through various practices:
    i. New hire fire awareness and evacuation training
    ii. Ongoing staff training
    iii. Facility sweeps by trained staff
    iv. Strategically placed fire safety and evacuation/sheltering protocol information, as determined by the Fire Safety Coordinator.

While the practices above for the Beaumont Heights Project would support an informed populace and would further improve safety and reduce and/or avoid problems during an evacuation, the evacuation modeling herein is not predicated on implementation of those practices. Therefore, as previously demonstrated, the Project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires or substantially impair implementation of or physically interfere with an adopted emergency evacuation plan or emergency response plan.

6 Recommended Mitigation

Wildfire Education Program: The Conditions of Approval for the Project shall require that the Project Property Management Agency to serve as the Project's Fire Safety Coordinator, responsible for preparing and implementing an educational program with wildfire-related information, including the Wildfire Evacuation Study (WES) and the Fire Protection Plan (FPP) requirements, to be provided to all occupants. The educational program shall be prepared in easy-to-understand, graphically based materials and shall be annually reviewed and updated, as appropriate, in order to maintain high wildfire awareness. Program features shall include, but may not be limited to, the following:

1. **Annual email and mailers:** Occupants shall be provided with biannual emails and mailers in April that include information such as reminders about annual defensible space inspections, how to prepare for wildfire season, evacuation information, prohibited high-risk activities, and how to prevent wildfires. Links to various resources on where to get trusted information, such as the Beaumont Police Department, Riverside County Fire Department, 211 Riverside County, B-Alert and Alert RivCo, shall be provided and updated annually, as necessary.
2. **Website:** A dedicated community website shall be developed and maintained with more detailed information and resources about wildfire awareness, prevention, and evacuation. The website shall serve as a centralized resource for the fire and evacuation education program and include information from the FPP and WES. In addition to general emergency preparedness education, the website shall include information that is included in emails, mailers, and workshops/webinars. The website shall have up-to-date fire watch and red flag warning alerts, as well as information on restrictions during fire weather conditions.
3. **New employee packet:** All occupants and new occupants in the future shall be presented with a wildfire awareness and safety package with new hire materials. Within the package will be a USB drive with the WES, FPP (which includes information on the regional fire hazard, how to build a go-bag, and tools to prepare a household evacuation plan), and a list of agencies and resources for receiving trusted information.
4. **Emergency alert campaign:** Residents shall be encouraged to sign up for B-Alert and Alert RivCo, the mass notification systems for emergency alerts, weather alerts, health notifications, building alerts, and other updates from City, County, state, and federal agencies. Reminders shall be sent out in the biannual mailers and emails, on the community website, in the workshops, and in the new resident package.
5. **Fire safety committee:** The Property Management Agency shall establish a fire safety committee, with at least one representative from each lease, responsible for overseeing the maintenance of site-wide fire protection features. Occupants will be able to report fire hazards or hazardous fuel conditions to the committee for remediation. The committee shall also be responsible for the creation and distribution of the educational program for the Project. The committee shall serve as a communication link between LACoFD and occupants.

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7 Limitations

Wildfire Evacuation Study ("WES")

This WES analyzes the existing community's evacuation times currently, and assuming the construction of the Project as it relates to wildfires; however, the components of the plan may also be useful in similar situations, as noted above. The estimated evacuation times are based on several assumptions detailed further below in this WES. However, actual evacuation times may be faster or slower than the estimates, depending on the type of emergency, the extent of the evacuation, its gravity, the time of day, and other factors. A collective, community–wide evacuation of existing populations and the proposed population from the Project would include congested roads in its existing condition that are improved, but still congested with the Project. Congested roads are normal in any urban setting when a large evacuation is declared unless it is managed appropriately (*e.g.*, evacuation areas are staggered to reduce the potential traffic surges that can significantly impact evacuations), there would still be the potential for congestion and delays.

This WES promotes the "Ready, Set, Go!" model, adopted by Riverside County Fire Department, CAL FIRE, and many fire agencies statewide. The goal is to raise agency and citizen awareness of potential evacuation issues and get a majority of the public "Ready" by taking a proactive stance on preparedness, training drills, and resident education, and evacuation planning efforts.

The Project populace will be "Set" by closely monitoring the situation whenever fire weather occurs and/or when wildfire occurs and elevating pre-planned protocol activities and situational awareness.

Lastly, fire or law enforcement officials will mandate that populations "Go" by executing pre-planned evacuation procedures. The preferred alternative, initially, may well be early evacuation. However, there may be instances when evacuation is not possible, is not considered safe, or is not an option based on changing conditions, or other factors.

The Project also is designed specifically to maintain an enhanced resistance to wildfire ignition and perform as a fire adapted Project, offering fire and law officials with additional options for safety to the populace compared to those options available to less thought-through projects.

As noted, this WES does not and cannot provide any guarantees. Fire is a dynamic and unpredictable occurrence, and it is important for those in a high fire severity zone to educate themselves on practices that will improve safety and that will be able to be implemented at the individual level rapidly and effectively, albeit in combination with protocols and "in-the-field" decision making of emergency responders.

Summary – Vehicle Travel Time Scenarios

This WES presents a reasonable vehicle travel time estimate based on professional judgments made by CRA, taking into consideration input from Dudek and other resources. Changing any number of these assumptions can lengthen or shorten the average vehicle travel time. For instance, a situation could arise in which professionals *may* choose to utilize additional roadways for evacuation not utilized in the Dudek/CRA analysis and *may also* choose to send more vehicle trips to certain evacuation routes and *may also* choose to guide vehicle trips to more or different route permutations relative to what has been modeled in this the Dudek/CRA analysis. The net result of changing the

variables selected could yield an average evacuation travel time shorter or longer than the results detailed in the Dudek/CRA analysis.

Many factors can shorten or lengthen the vehicle time from the results shown herein. For example:

1. Changing the possible evacuation routes selected would affect the results. For instance, utilizing roads for ingress and/or egress that are not utilized in this analysis could shorten vehicle travel times relative to the results shown herein.
2. Increasing or decreasing the number of path permutations and percentage of the population utilizing each route that leads out of the immediate area could shorten or lengthen vehicle travel time relative to the results shown herein.
3. Emergency professionals electing to reserve certain road lanes for emergency vehicle ingress for portions of time could affect the travel time relative to the results shown herein.
4. Assuming evacuees utilize fewer or more vehicles to evacuate from the Project or surrounding communities relative to the Vehicle Utilization Rate selected in the analysis would shorten or lengthen vehicle travel time relative to the results shown herein.
5. Changing the mix of vehicle trips allocated to each evacuation route could shorten or lengthen vehicle travel time relative to the results shown herein.
6. Assuming a different road capacity adjustment factor could shorten or lengthen the vehicle travel time relative to the results shown herein.
7. Assuming fewer people are at home when the evacuation notice is given would reduce the number of vehicle trips and shorten vehicle travel time relative to the results shown herein. For instance, an evacuation during daytime hours would typically result in fewer outbound trips than assumed in this analysis.
8. Assuming some portion of vehicle trips are made in advance of the evacuation notice would reduce the number of vehicle trips relative to the results shown herein.
9. Assuming emergency professionals elect to implement contraflow on certain roadways to open up additional lanes for emergency evacuation egress could reduce the travel time results shown herein.
10. The availability of new information, unexpected weather conditions, and other unforeseen factors such as changes in fuel loads or shifting weather patterns may influence fire behavior and evacuation outcomes in ways not anticipated at the time of this analysis.
11. Assuming some homeowners and their families are not in the Study Area when evacuation notice is given (most likely in a daytime evacuation event), could reduce the number for vehicle trips relative to the results shown herein.

The evacuation time analysis is necessarily limited in scope given the numerous variables inherent in a wildfire and evacuation event. However, as discussed above, it is not anticipated that the Project will significantly impact evacuation of the proposed or existing surrounding communities based on evacuation times and other qualitative considerations.

Limitation On Reliance Or Dependence Upon Report

Any person or entity furnished with this report and/or who reviews it agrees that the advance written consent of Dudek be sought and furnished to such person or entity prior to the review, reliance or authorization as to any matters that are the subject of the reports by any person or entity (whether through act or omission as set forth in the report), other than Dudek's direct client. In such case, obtaining Dudek's consent shall not be subject to any fee or charge (other than reasonable copy costs, where applicable).

Dudek expressly disavows, does not assume any responsibility for, nor will be liable for any claims, losses, or damages associated with any matters that are the subject of this or other reports it prepares or contributes to respecting this project, however characterized (including without limitation as sounding in tort, breach of contract, misrepresentation by act or omission, failure to adhere to applicable standards of professionalism, statutory liability, etc.), whether in law or equity, whether known or unknown, and whether actual or contingent, excepting only Dudek's direct client, as to which the limitation of liability provisions in the contract between Dudek and its client shall govern.

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Appendix A

Local and State Preparedness Resources

Write your family's name above

Family Emergency Communication Plan

IN CASE OF EMERGENCY (ICE) CONTACT

Name: ..... Mobile #: .....
Home #: ..... Email: .....
Address: .....

OUT-OF-TOWN CONTACT

Name: ..... Mobile #: .....
Home #: ..... Email: .....
Address: .....

FOLD HERE

HOUSEHOLD INFORMATION

Home #: .....
Address: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information .....

FOLD HERE

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

FOLD HERE

SCHOOL, CHILDCARE , CAREGIVER, AND WORKPLACE EMERGENCY PLANS

Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

FOLD HERE

Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

EMERGENCY MEETING PLACES

Indoor: .....
Instructions: .....
.....

Neighborhood: .....
Instructions: .....
.....

Out-of-Neighborhood: .....
Address: .....
Instructions: .....
.....

Out-of-Town: .....
Address: .....
Instructions: .....
.....

IMPORTANT NUMBERS OR INFORMATION

Police: ..... Dial 911 or #: .....
Fire: ..... Dial 911 or #: .....
Poison Control: ..... #: .....
Doctor: ..... #: .....
Doctor: ..... #: .....
Pediatrician: ..... #: .....
Dentist: ..... #: .....
Medical Insurance: ..... #: .....
Policy #: .....
Medical Insurance: ..... #: .....
Policy #: .....
Hospital/Clinic: ..... #: .....

Pharmacy: ..... #: .....
Homeowner/Rental Insurance: ..... #: .....
Policy #: .....
Flood Insurance: ..... #: .....
Policy #: .....
Veterinarian: ..... #: .....
Kennel: ..... #: .....
Electric Company: ..... #: .....
Gas Company: ..... #: .....
Water Company: ..... #: .....
Alternate/Accessible Transportation: ..... #: .....
Other: .....
Other: .....

Write your family's name above

Family Emergency Communication Plan

IN CASE OF EMERGENCY (ICE) CONTACT

Name: ..... Mobile #: .....
Home #: ..... Email: .....
Address: .....

OUT-OF-TOWN CONTACT

Name: ..... Mobile #: .....
Home #: ..... Email: .....
Address: .....

FOLD HERE

HOUSEHOLD INFORMATION

Home #: .....
Address: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information .....

FOLD HERE

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

FOLD HERE

SCHOOL, CHILDCARE , CAREGIVER, AND WORKPLACE EMERGENCY PLANS

Name: .....
Address: .....
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Emergency Plan/Pick-Up: .....

Name: .....
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Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

EMERGENCY MEETING PLACES

Indoor: .....
Instructions: .....
.....

Neighborhood: .....
Instructions: .....
.....

Out-of-Neighborhood: .....
Address: .....
Instructions: .....
.....

Out-of-Town: .....
Address: .....
Instructions: .....
.....

IMPORTANT NUMBERS OR INFORMATION

Police: ..... Dial 911 or #: .....
Fire: ..... Dial 911 or #: .....
Poison Control: ..... #: .....
Doctor: ..... #: .....
Doctor: ..... #: .....
Pediatrician: ..... #: .....
Dentist: ..... #: .....
Medical Insurance: ..... #: .....
Policy #: .....
Medical Insurance: ..... #: .....
Policy #: .....
Hospital/Clinic: ..... #: .....

Pharmacy: ..... #: .....
Homeowner/Rental Insurance: ..... #: .....
Policy #: .....
Flood Insurance: ..... #: .....
Policy #: .....
Veterinarian: ..... #: .....
Kennel: ..... #: .....
Electric Company: ..... #: .....
Gas Company: ..... #: .....
Water Company: ..... #: .....
Alternate/Accessible Transportation: ..... #: .....
Other: .....
Other: .....

Car

Make an Emergency Kit for your Car

With so much time spent on the road it's a good idea to keep some basic emergency supplies in your vehicle.

For those who commute to and from work you may find yourself cut off from your home. The supplies you keep in your vehicle could be all you have until you are able to get home. Below are some important tips to help you prepare a kit for your car, as well as some important safety considerations that may help you keep your vehicle ready when disaster strikes.

In addition to keeping a kit in your vehicle, keeping current on maintenance and repairs will ensure your car is ready when you need it most. Windshield wipers, adequate tire tread and heating and air conditioning systems are examples of things that may help you during adverse weather. In a disaster fuel pumps may not work so it's a good idea to get in the habit of always making sure you have at least half a tank of gas.

In case you are stranded, keep a kit of emergency supplies in your car including:

- Jumper cables: might want to include reflective triangles as well
- Flashlights: with extra batteries
- First Aid Kit: remember any necessary medications, baby formula and diapers if you have a small child
- Food: non-perishable food such as canned food, and protein rich foods like nuts and energy bars
- Manual can opener
- Water: at least 1 gallon of water per person a day for at least 3 days
- Basic toolkit: pliers, wrench, screwdriver
- Pet supplies: food and water
- Radio: battery or hand cranked

- Ice scraper
- Clothes: warm clothes, gloves, hat, sturdy boots, jacket and an extra change of clothes for the cold
- Blankets or sleeping bags
- Charged Cell Phone: and car charger

(951) 358-7100

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CALIFORNIA WILDFIRE HOME SAFETY CHECKLIST

• HOW COMMON ARE CALIFORNIA WILDFIRES? •

At least 6,284 wildfires occurred in California in 2018, according to the California Department of Forestry and Fire Protection (CAL FIRE). These fires burned approximately 876,147 acres of land.

• WHAT TO DO BEFORE A CALIFORNIA WILDFIRE •

Separate your home from flammable materials

Create at least 30 feet of space between your home and flammable vegetation and materials.

Trim trees and shrubs

Ensure trees and shrubs do not come into contact with electrical wires or hang over your home's chimney.

Clean your home's roof

Remove pine needles, leaves and other debris from your home's roof.

Store combustible materials properly

Store combustible or flammable materials in approved containers.

Pick up battery-operated flashlights and radios

Keep battery-operated flashlights and radios with additional fresh batteries in a safe, easy-to-access location in your home.

• WHAT TO DO DURING A CALIFORNIA WILDFIRE •

Stay up to date

Use a TV or radio to receive wildfire emergency updates.

Set up hoses and water

If possible, fill buckets with water and set up hoses outside your home.

Turn on the house lights

Activate the lights in each room of your home.

Remove flammable drapes or curtains

Take down flammable drapes or curtains in your home.

Get ready to evacuate

Prepare all family members and pets to evacuate your home.

• WHAT TO DO AFTER A CALIFORNIA WILDFIRE •

Contact local fire officials

Check in with local fire officials to find out if it is safe to return home.

Look for hot spots

Check the ground for smoldering stumps and other hot spots and use buckets of water on these spots as needed.

Examine your home's exterior

Look for sparks and embers across your home's roof and exterior areas.

Evaluate your home's interior

Keep an eye out for hidden burning in each room of your home.

9-1-1

Call 911

Contact 911 if you identify any potential dangers.

How much do you know about wildfires?

True or False:

1. An average of 7 million acres of US woodland burn every year.
2. 1 in 5 wildfires are caused by humans.
3. Wildfires move faster downhill.
4. Some species of trees and shrubs require fire to reproduce.
5. The 'fuel' (trees, plants, etc.) you see burning isn't really on fire.
6. There are three broad types of fire spread: Subterranean, Surface and Crown fires.
7. Only YOU can prevent wildfires.

1. True: Across the US, including Alaska, approximately 7 million acres of federal, tribal, state and private land burns annually.

2. False: More than 4 out of 5 wildfires are caused by humans.

3. False: Fire moves faster uphill. The steeper the slope, the faster the fire travels.

4. True: Species such as Ceanothus and many types of closed-cone coniferous trees require heat to germinate.

5. True: The fuel itself is not on fire, but rather, is being converted into a gas. It's the gas produced by the fuel that is actually burning.

6. False: The three types of fire spread are: Ground - organic material in the soil is burning; Surface - leaf litter, fallen braches, etc. on the ground are burning; Crown - the top layer of foliage from trees is burning.

7. True:!

WILDFIRE IS COMING.
ARE YOU READY?

WILDFIRE ACTION PLAN

BE PREPARED

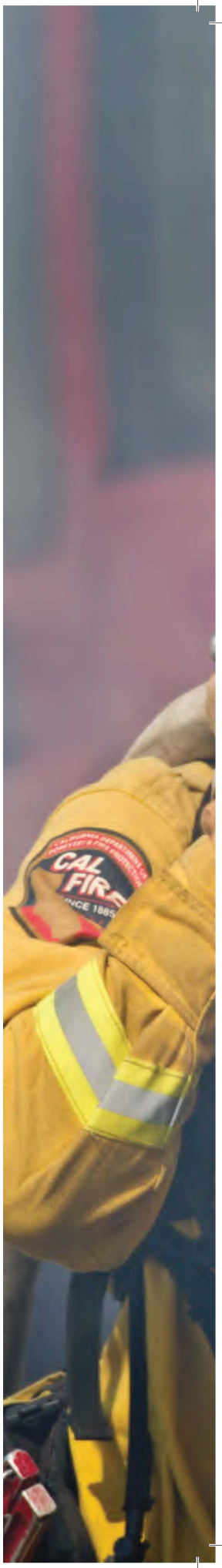
Wildfires are a fact of life in California. It's not a question of if they will occur, but when. Catastrophic wildfires are increasing in our state, encroaching further into populated areas. It is extremely important that Californians be prepared when wildfire strikes.

By preparing your home and property for wildfire, and knowing what to do if evacuation is necessary, you can dramatically increase your safety and the survivability of your home. It is your responsibility to prepare yourself, your family, and your home for when wildfire strikes.

This guide illustrates the importance of creating and maintaining Defensible Space and hardening your home by retrofitting it with ignition-resistant or noncombustible materials to protect against the threat of flying embers, direct flame contact, and radiant heat exposure. It also provides information about the preparations and precautions to make in order to evacuate early and safely.

If you need more information about preparing for wildfire or any other disaster, contact your nearest fire station or visit us at ReadyforWildfire.org.

These counties receive funding from the state to provide fire protection and prevention services to State Responsibility Area lands within their boundaries.



CONTENTS

GET READY

Hardening Your Home 4
Defensible Space 6
Fire Smart Landscaping 9

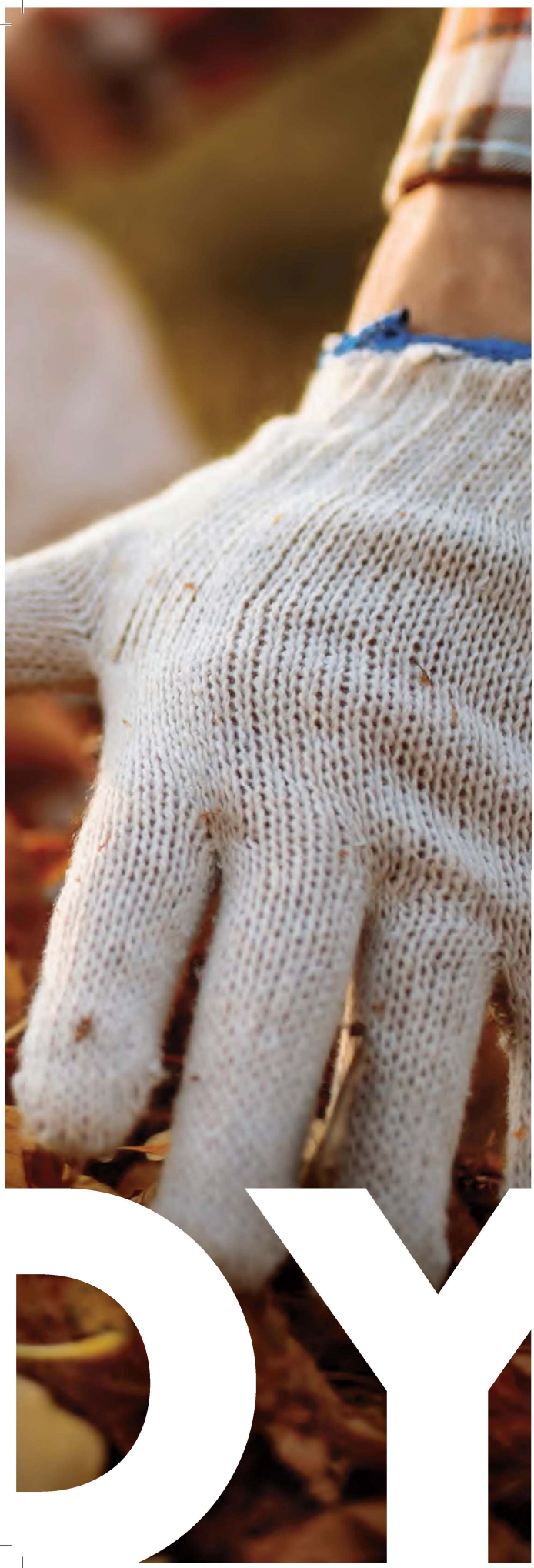
GET SET

Create a Wildfire Action Plan 12
The Six Ps 13
Emergency Supply Kit 14
Be Prepared for Power Outages 15
Family Communication Plan 16
Insurance Preparedness 17

GO!

Pre-Evacuation Steps 20
Evacuation Steps 21
When to Evacuate 21
Animal Evacuation 22
What to Do if Trapped 23
Returning Home After a Wildfire 24

GET
REA



There are three ways your home can be exposed to wildfire: through flying embers, direct flame contact, and radiant heat exposure.

Embers are the main cause of homes igniting during a wildfire. Wind can blow embers up to a mile ahead of a wildfire. These flying embers can directly ignite materials on, or attached to, a home. They can also ignite vegetation or combustible materials near the home, resulting in a subsequent fire that spreads to the home through direct flame contact or radiant heat.

Direct flame contact to the home can be the result of nearby vegetation or combustible materials catching on fire due to embers, or from the wildfire burning unchecked directly to the building.

Radiant heat exposure occurs when there are materials, vegetation, or other combustibles, that are burning close to the home—for a long enough period of time—and generate enough heat to directly ignite a combustible component of the home.

Getting ready for wildfire begins with two very important efforts: **Home Hardening** and **Defensible Space.** Hardening your home is retrofitting it with fire-resistant materials. Defensible Space is creating and maintaining a buffer between buildings and vegetation to slow wildfire. While not a guarantee that your home will survive a wildfire, these efforts give it the best chance.

HARDENING YOUR HOME

Now is the time to retrofit your home—before a wildfire strikes. California Building Code Chapter 7A requires specific construction materials and methods for the building of new homes in wildfire-prone areas. These same materials and methods are also the minimum standards recommended when retrofitting a home. Retrofitting prepares your home for the exposure it will experience during a wildfire. Here's what you can do to harden your home:

ROOF

Your roof is the most vulnerable part of your home. Homes with wood shake or shingle roofs are at high risk of being destroyed in a wildfire.

- Replace wood shake or shingle roofs with a Class A fire-rated roof, using materials such as composition, metal, or tile.
- Inspect your roof and maintain it by removing debris and plugging gaps.

VENTS

Vents on homes create openings for flying embers.

- Avoid storing combustible items near attic or crawl space vents.
- Inspect vents to ensure they are in good condition with no tears or large openings.
- Cover all vent openings with 1/16 inch to 1/8 inch corrosion-resistant metal mesh screen.
- Consider replacing screened vents with ember and flame-resistant vents.

EAVES AND SOFFITS

Eaves and soffits are a point of entry for flying embers from fires up to a mile away or flames from nearby vegetation or other material burning.

- Plug or caulk gaps greater than 1/8 inch in size with durable caulk.
- Enclose eaves with ignition-resistant or noncombustible materials if possible.

WINDOWS

Heat from a wildfire can cause windows to break before the home ignites, allowing embers to enter and start fires inside. Single-paned and large windows are particularly at risk.

- Install dual or multi-paned windows with at least one pane being tempered glass.
- Consider limiting the size and number of windows that face large areas of vegetation.
- Install metal mesh screens on openable windows to increase ember resistance and reduce radiant heat exposure.

DECKS

Surfaces within 10 feet of the building should be built with ignition-resistant, noncombustible, or other approved materials.

- Remove all combustible items from underneath deck.
- Limit combustible items on top of deck. Bring these items inside the home or move them away from the home when wildfire threatens.

EXTERIOR WALLS

Wood products such as boards, panels, or shingles are common siding materials. However, they are combustible and not good choices for wildfire prone areas.

- Use noncombustible materials such as stucco, metal, or fiber cement, or use ignition-resistant siding.
- Be sure to extend materials from the foundation to the roof.
- Plug or caulk gaps and joints with openings greater than 1/8 inch.

RAIN GUTTERS

Screen or enclose rain gutters with noncombustible corrosion-resistant materials to prevent accumulation of plant debris.

PATIO COVERS

Consider using noncombustible material within eight feet of buildings.

CHIMNEYS

Cover chimney or stovepipe outlet with a noncombustible corrosion-resistant metal mesh screen with openings between 3/8 inch and 1/2 inch in size. Close the fireplace flue during fire season when the fireplace is not in use.

FENCES

Construct fences using noncombustible materials within eight feet of your home.

GARAGES

Install weather stripping to eliminate gaps around garage doors. Add a battery back-up to automatic garage door openers so the garage can easily be opened if the power is out.

DRIVEWAYS

Ensure that access to your home complies with local fire codes.

WATER SUPPLY

Have multiple garden hoses long enough to reach all areas of your house.

ADDITIONAL HOME FIRE SAFETY RESOURCES

HOME HARDENING INFORMATION GUIDE

ReadyforWildfire.org

CALIFORNIA BUILDING CODE CHAPTER 7A

codes.iccsafe.org

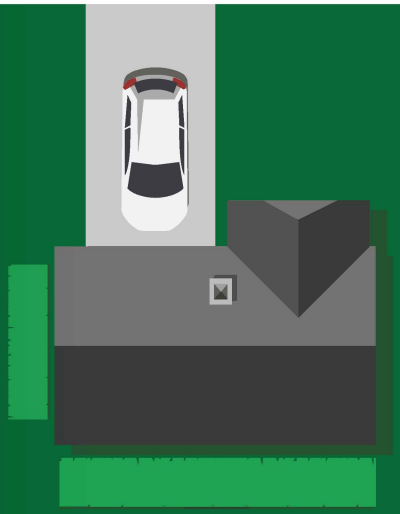
WILDFIRE HOME RETROFIT GUIDE

ReadyforWildfire.org

BUILDING MATERIALS LISTING

osfm.fire.ca.gov

DEFENSIBLE SPACE



Creating and maintaining Defensible Space is essential to reducing the impact of wildfire on your home and property. Defensible Space is the buffer created between a building on your property and the plants, brush, trees, or other combustible items in the near vicinity. This buffer helps to keep wildfire away from your home by reducing the fire's intensity and slowing or halting the spread of wildfire. The less there is to burn near your home, the less exposure your home will have to wildfire. Creating this space also provides protection for the firefighters defending your home.

CREATING AND MAINTAINING YOUR DEFENSIBLE SPACE

Within the 100-foot perimeter of a home, there is a need for more intense reduction of wildfire fuels. Start at the home and work your way out 100 feet or to your property line, whichever is closer.

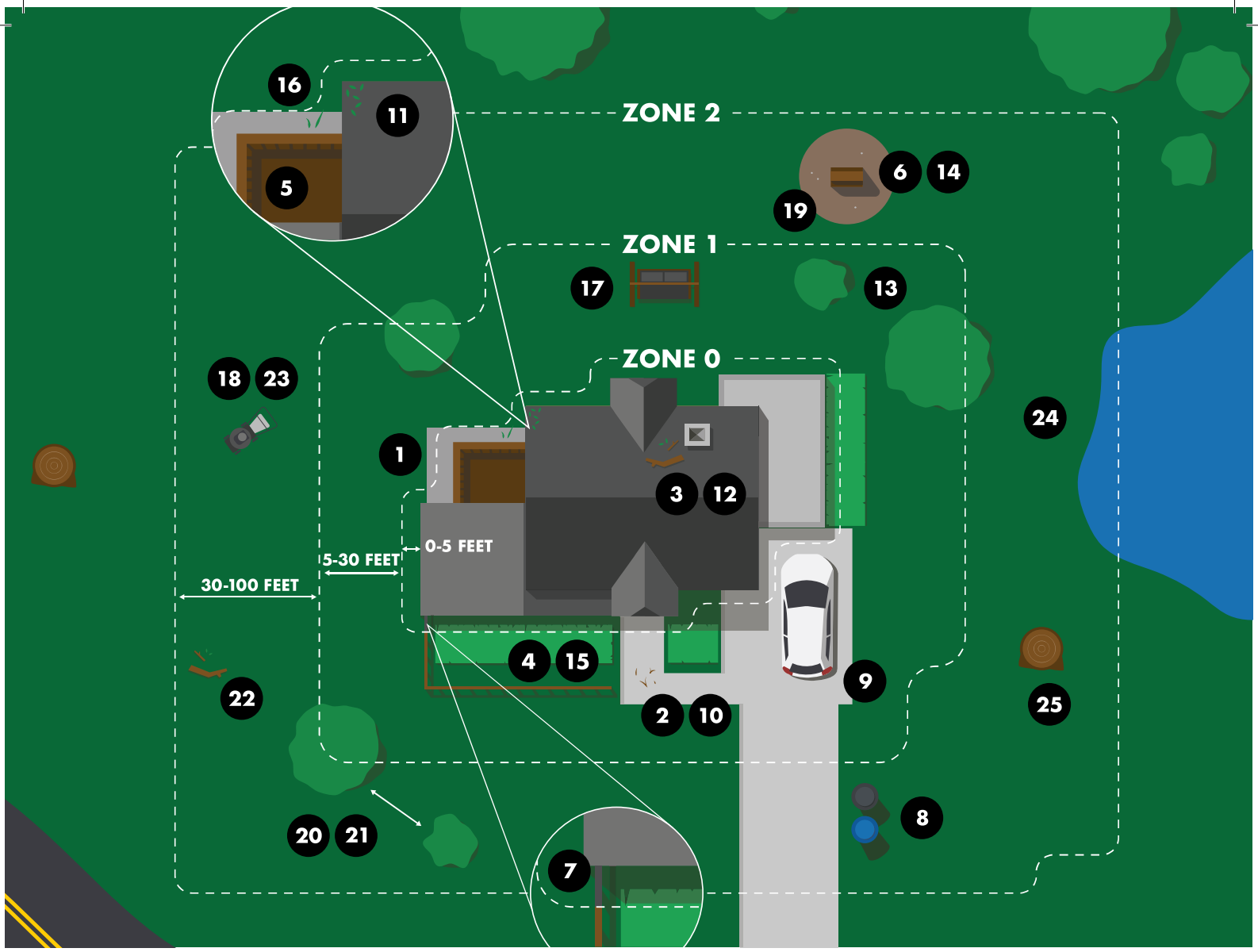
KNOW THE LAW - BE FIRE SMART

One hundred feet of Defensible Space is required under the Public Resources Code (PRC) 4291. Zones 1 and 2 currently make up the 100 feet of Defensible Space required by law. Assembly Bill 3074, passed into law in 2020, requires an ignition-resistant Zone 0 for Defensible Space.

Many local government agencies have ordinances for Defensible Space. These local ordinances will often be more stringent than the state of California's minimum requirement in PRC 4291. Check with your local fire department or fire protection district for any additional Defensible Space requirements. **fire.ca.gov/dspace**

Zone 0 extends from zero to five feet from buildings, structures, decks, etc.

1. Use hardscape like gravel, pavers, concrete, and other noncombustible mulch materials. No combustible bark or mulch.
2. Remove all dead and dying weeds, grass, branches, and vegetative debris. Check your roofs, gutters, decks, porches, stairways, etc.
3. Remove all branches within 10 feet of any chimney or stovepipe outlet.
4. Limit plants in this area to low growing, nonwoody, properly watered, and maintained plants.
5. Limit combustible items (outdoor furniture, planters, etc.) on top of decks.
6. Relocate firewood and lumber to Zone 2.
7. Replace within Zone 0 combustible fencing, gates, and arbors attached to the home with noncombustible alternatives.



8. Relocate garbage and recycling containers outside this zone.
9. Relocate boats, RVs, vehicles, and other combustible items outside this zone.

Zone 1 extends five to 30 feet from buildings, decks, and other structures.

10. Remove all dead plants, grass, and weeds (vegetation).
11. Remove dead or dry leaves and pine needles from your yard, roof, and rain gutters.
12. Remove branches that hang over your roof and keep dead branches 10 feet away from your chimney or stovepipe outlet.
13. Trim trees regularly to keep branches a minimum of 10 feet from other trees.
14. Relocate exposed wood piles outside of Zone 1.
15. Remove or prune flammable plants and shrubs near windows.
16. Remove vegetation and items that could catch fire from around and under decks.
17. Create a separation between trees, shrubs, and items that could catch fire, such as patio furniture, wood piles, swing sets, etc.

Zone 2 extends from 30 feet to 100 feet from buildings, structures, decks, etc.

18. Cut or mow annual grasses to a maximum height of four inches.
19. All exposed wood piles must have a minimum of 10 feet clearance around them, down to bare mineral soil, in all directions.
20. Create horizontal space between shrubs and trees. (See diagram on page 11)
21. Create vertical space between grass, shrubs, and trees. (See diagram on page 11)
22. Remove fallen leaves, needles, twigs, bark, cones, and small branches. However, they may be permitted to a depth of three inches.

All zones

23. Mow before 10 a.m., but never when it's windy or excessively dry.
24. Protect water quality. Do not clear vegetation near waterways to bare soil. Vegetation removal can cause soil erosion—especially on steep slopes.
25. Logs or stumps embedded in the soil must be removed in Zone 0. In Zones1and 2 they need to be removed or isolated from other vegetation.

It takes the combination of both Defensible Space and Home Hardening to give your home and property the best chance of surviving a wildfire. Below are examples of low-risk and high-risk scenarios:

HIGH RISK

UNENCLOSED EAVES

UNSCREENED VENTS

DEFENSIBLE SPACE NONCOMPLIANT

LOW RISK

ENCLOSED EAVES

SCREENED VENTS

DEFENSIBLE SPACE COMPLIANT

FIRE SMART LANDSCAPING

While some plants are characterized as "fire-safe" or "fire-resistant," all plants will burn under the right conditions, regardless of how they are classified. The environment the plant grows in, how it is maintained, and its placement and spacing near other vegetation and combustibles will generally have more influence on the flammability of the plant than how it is characterized. Taking these items into consideration is crucial to reduce the spread of wildfire to your home. Scan the QR code below for more information.

FIRE SMART LANDSCAPING
ReadyforWildfire.org/fire-smart-landscaping

MINIMUM VERTICAL SPACING BETWEEN TREES AND SHRUBS

Eliminate opportunities for a vertical "fire ladder":

- Remove branches beneath large trees for a six-foot minimum clearance.
- Create proper vertical spacing between shrubs and the lowest branches of trees. See adjacent diagrams.

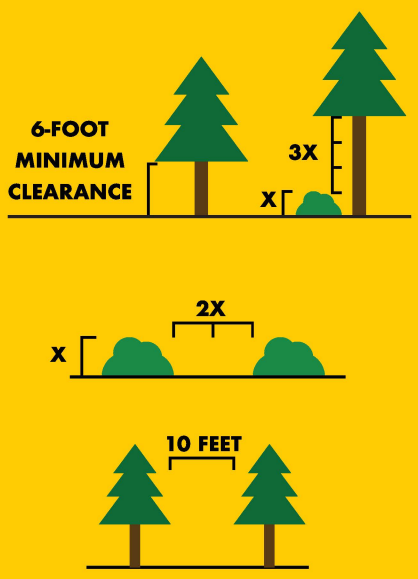
MINIMUM HORIZONTAL SPACING BETWEEN TREES AND SHRUBS

Horizontal spacing depends on the slope of the land and the height of the shrubs or trees. See adjacent diagrams.

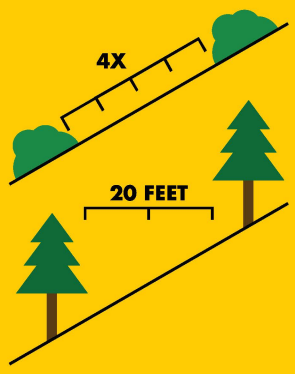
DEAD TREE REMOVAL

If you have dead or dying trees on your property, the entire tree needs to be removed to reduce wildfire risk. Scan the QR code below to learn about permit requirements.

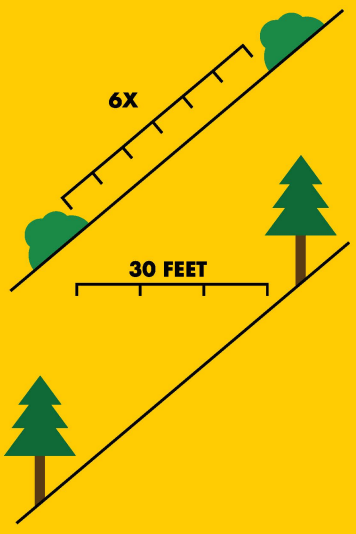
PERMIT REQUIREMENTS
ReadyforWildfire.org/dead-tree-removal



Flat to mild slope (<20%)

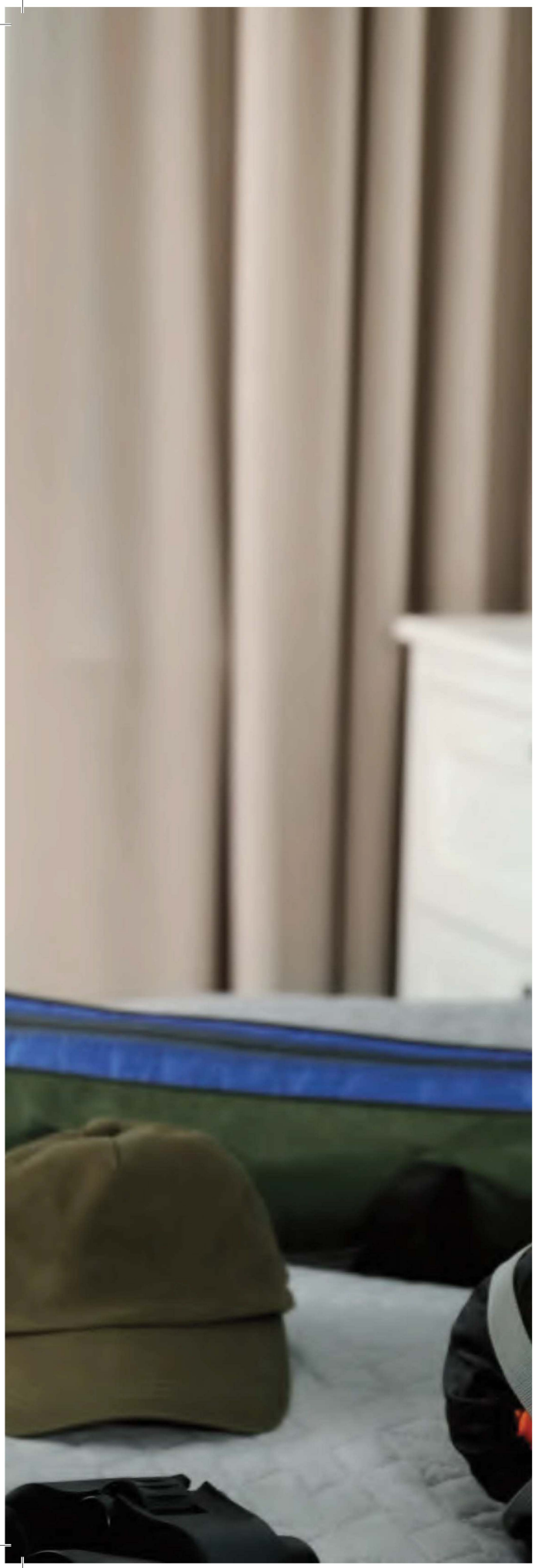


Mild to moderate slope (20%–40%)



Moderate to steep slope (>40%)

KIT



It is important that you are prepared **before** wildfire strikes. In an emergency it is easy to become confused or panicked.

Getting Set requires three main preparation actions:

- Creating a Wildfire Action Plan
- Creating an Emergency Supply Kit
- Creating a Family Communication Plan

Preparing these items in advance will help keep you focused and able to act quickly when evacuation is anticipated or needed.

Use this guide to complete these actions to prepare in advance of wildfire.

READY FOR WILDFIRE INCIDENT APP

Scan the QR code below to access accurate updates about active wildfires near you with our web-based Ready for Wildfire Incident App.

ACTION PLAN CHECKLIST

CREATE A WILDFIRE ACTION PLAN

Your Wildfire Action Plan must be prepared and familiar to all members of your household well in advance of a wildfire. Use the checklist below to help create your plan. Each family's plan will be different, depending on a variety of issues, needs, and situations.

Create an evacuation plan that includes:

- ○ A designated emergency meeting location outside the fire or hazard area. This is critical to determine who has safely evacuated from the affected area.
- ○ Identification of several different escape routes from your home and community. Practice these routes often so everyone in your family is familiar with them in case of emergency. Go to page 18 to write down your evacuation routes.
- ○ An evacuation plan for pets and large animals such as horses and other livestock.
- ○ A Family Communication Plan that designates an out-of-area friend or relative as a point of contact to act as a single source of communication among family members in case of separation. It is easier to call or message one person and let them contact others than to try and call everyone when phone, cell, and internet systems can be overloaded or limited during a disaster and under a stressful situation. See page 18 for a Family Communication Plan form.

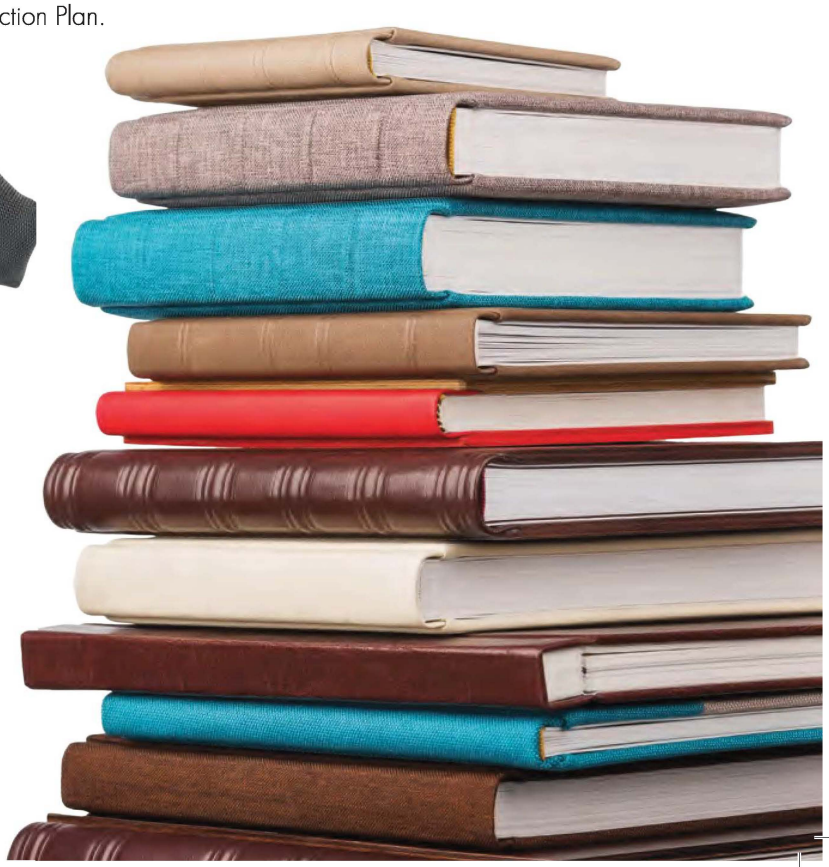
Be prepared:

- ○ Have fire extinguishers on hand and make sure everyone in the family knows how to use them. Many fire extinguishers have expiration dates, so make sure to check yours.
- ○ Ensure you and your family know where the home's gas, electric, and water main shut-off controls are located and how to safely shut them down in an emergency.
- ○ Assemble an Emergency Supply Kit for each person, as recommended by the American Red Cross. See Emergency Supply Kit on page 16 for details.
- ○ Maintain a list of emergency contact numbers in your cell phone, posted near your home phone, and in your Emergency Supply Kit.
- ○ Keep an extra Emergency Supply Kit in your car in case you cannot get to your home because of fire or other emergency.
- ○ Have a portable radio or scanner, or follow the Ready for Wildfire App so you can stay updated on wildfires. Follow local law enforcement notifications for any evacuation information. Visit incidents.ReadyforWildfire.org or scan QR code on page 13 to view the incident app.
- ○ Tell your neighbors about Ready, Set, Go! and your Wildfire Action Plan.

THE SIX Ps

Remember the "Six Ps" and keep them ready in case immediate evacuation is required:

- ○ People and pets
- ○ Papers, phone numbers, and important documents
- ○ Prescriptions, vitamins, and eyeglasses
- ○ Pictures and irreplaceable memorabilia
- ○ Personal computer, hard drive, and disks
- ○ "Plastic" (credit cards, ATM cards) and cash



EMERGENCY SUPPLY KIT

Put together your Emergency Supply Kit—also called a "go bag"—before a wildfire or other disaster occurs and keep it easily accessible so you can take it with you when you evacuate. Backpacks work great for storing these items (except food and water) and are quick to grab. Storing food and water in a tub or chest on wheels will make it easier to transport. Keep it light enough to be able to lift it into your car.

Emergency Supply Kit Contents:

- ○ Face masks or coverings
- ○ Three-day supply of non-perishable food and three gallons of water per person
- ○ Map marked with at least two evacuation routes
- ○ Prescriptions or special medications
- ○ Change of clothing, including a cotton long-sleeved shirt and pants
- ○ Extra eyeglasses or contact lenses
- ○ An extra set of car keys, phone charger, credit cards, cash, or traveler's checks
- ○ First aid kit
- ○ Flashlight
- ○ Battery-powered radio and extra batteries
- ○ Sanitation supplies
- ○ Copies of important documents (birth certificates, passports, insurance, etc.)
- ○ Food, water, and medications for pets
- ○ Can opener

Items to take if time allows:

- ○ Easily carried valuables
- ○ Family photos and other irreplaceable items
- ○ Personal computer information on hard drives and disks
- ○ Extra cell phone chargers, laptops, etc.

Always keep a sturdy pair of shoes and a flashlight near your bed handy in case of a sudden evacuation at night.

OUR FAMILY'S ADDITIONAL SUPPLY KIT MUST HAVES ARE:

BE PREPARED FOR POWER OUTAGES

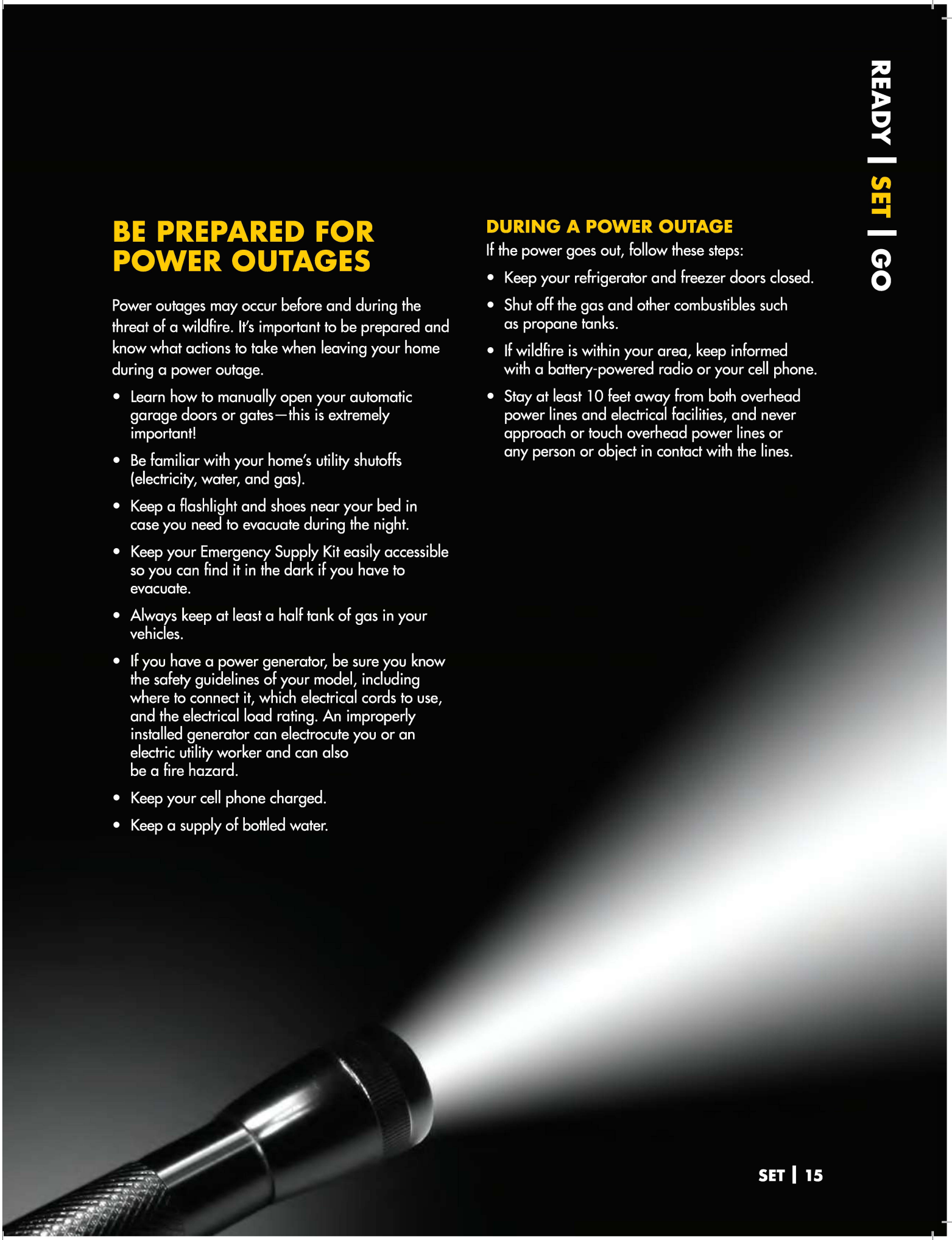
Power outages may occur before and during the threat of a wildfire. It's important to be prepared and know what actions to take when leaving your home during a power outage.

- Learn how to manually open your automatic garage doors or gates—this is extremely important!
- Be familiar with your home's utility shutoffs (electricity, water, and gas).
- Keep a flashlight and shoes near your bed in case you need to evacuate during the night.
- Keep your Emergency Supply Kit easily accessible so you can find it in the dark if you have to evacuate.
- Always keep at least a half tank of gas in your vehicles.
- If you have a power generator, be sure you know the safety guidelines of your model, including where to connect it, which electrical cords to use, and the electrical load rating. An improperly installed generator can electrocute you or an electric utility worker and can also be a fire hazard.
- Keep your cell phone charged.
- Keep a supply of bottled water.

DURING A POWER OUTAGE

If the power goes out, follow these steps:

- Keep your refrigerator and freezer doors closed.
- Shut off the gas and other combustibles such as propane tanks.
- If wildfire is within your area, keep informed with a battery-powered radio or your cell phone.
- Stay at least 10 feet away from both overhead power lines and electrical facilities, and never approach or touch overhead power lines or any person or object in contact with the lines.



SAVE THIS
FAMILY COMMUNICATION PLAN

Fill out this form and place it in a location where it can easily be found by everyone in your household. Copy the form and keep it in your Emergency Supply Kit. This will allow all family members to have access to this key information in case you get separated.

WHEN WE HAVE TO EVACUATE, WE WILL MEET AT:

_____

OUR OUT-OF-AREA EMERGENCY CONTACT PERSON IS:

Name: _____

Home Phone #: _____

Relationship: _____

E-mail: _____

Cell Phone #: _____

OTHER IMPORTANT NUMBERS ARE:

Emergency 911: _____

Local Police: _____

Local Fire Department: _____

Other: _____

Other: _____

Other: _____

OUR TWO EVACUATION ROUTES ARE (DESCRIBE BELOW):

_____ _____

_____ _____

_____ _____

_____ _____

INSURANCE PREPAREDNESS

A home is generally your largest asset. Protect it.

Insurance is the critical back-up plan enabling you to rebuild your home after a wildfire. Follow these tips as part of your Ready, Set, Go! Wildfire Action Plan:

Conduct an annual insurance checkup

- Call your agent or insurance company annually to discuss your policy limits and coverage. Make sure your policy reflects the correct square footage and features in your home. Consider purchasing building code upgrade coverage.

Know what your policy covers

- Know if you have a replacement-cost policy that pays to replace all of your items at current market price, or if you have an actual cash value policy that takes depreciation into account and pays less for aged items.

Update your policy to cover home improvements

- If you make home improvements, be sure to call your agent or company to update your coverage. Make sure your insurer knows about the changes, so that new countertops, floors, rooms, etc., are covered if you must rebuild.

Maintain insurance

- If your home is paid off, be sure to maintain homeowner insurance. Without insurance, costs to repair or replace a home or structure is the responsibility of a homeowner.

Get renters insurance

- Renters can lose everything in a fire and be left to start over. Many insurers bundle renters insurance coverage with an auto insurance policy at affordable prices.

Make a home inventory

- Document the contents of your home before a wildfire occurs. Use your cell phone to video your belongings or a camera to take photos. Store the inventory list and photos at a location away from the property and/or in a cloud internet server. Include the cost of items and note important or expensive items. If possible, keep receipts for major purchases.
- Don't forget to include items inside the home, inside the garage, and outside of the home.

GO

Give your household the best chance of surviving a wildfire by being ready to go and evacuating early.

Being ready to go means following pre-evacuation steps, knowing when to evacuate, preparing possible evacuation routes, and knowing what to do if you become trapped.

Be safe and don't wait until it's too late! Use these checklists to help prepare you and your family to be ready to evacuate if wildfire strikes.

It is also important to learn what to expect after a wildfire and what you should do before returning home. The danger is not over after the flames are put out.

KNOW THE LAW—BE READY TO EVACUATE

California law authorizes officers to restrict access to any area where a menace to public health or safety exists due to a calamity such as flood, storm, fire, earthquake, explosion, accident, or other disaster. Refusal to comply is a misdemeanor. (Penal Code 409.5)

PRE-EVACUATION STEPS

When evacuation is anticipated, follow these checklists (if time allows):

Outside

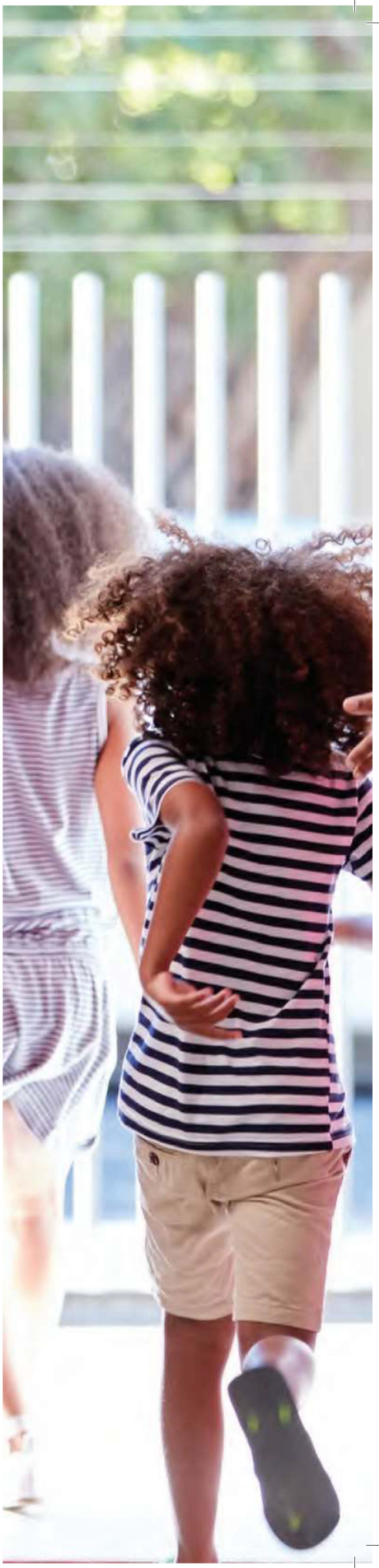
- ○ Gather flammable items from the exterior of the house and bring them inside (patio furniture, children's toys, door mats, trash cans, etc.) or place them in your pool.
- ○ Turn off propane tanks.
- ○ Move propane BBQ appliances away from structures.
- ○ Connect garden hoses to outside water valves or spigots for use by firefighters. Fill water buckets and place them around the house.
- ○ Turn off sprinklers and running water; leaving them on can affect critical water pressure.
- ○ Leave exterior lights on so your home is visible to firefighters in the smoke or darkness of night.
- ○ Put your Emergency Supply Kit in your vehicle.
- ○ Back your car into the driveway with vehicle loaded and all doors and windows closed. Carry your car keys with you.
- ○ Have a ladder available and place it at the corner of the house for firefighters to quickly access your roof.
- ○ Seal attic and ground vents with pre-cut fire-resistant boards or commercial seals.
- ○ Monitor your property and the fire situation. Don't wait for an evacuation order if you feel threatened and need to leave.
- ○ Check on neighbors and make sure they are preparing to leave.

Inside the House

- ○ Shut all windows and doors, leaving them unlocked.
- ○ Remove flammable window shades and curtains. Close metal shutters.
- ○ Move flammable furniture to the center of the room, away from windows and doors.
- ○ Shut off gas at the meter or tank. Turn off pilot lights.
- ○ Leave your lights on so firefighters can see your house under smoky conditions.
- ○ Shut off the air conditioning or heater.

Animals

- ○ Locate your pets and keep them nearby.
- ○ Prepare livestock for transport and consider moving them to a safe location early.



READY | SET | GO

EVACUATION STEPS

- ○ Review your Evacuation Checklist.
- ○ Ensure your Emergency Supply Kit is in your vehicle.
- ○ Cover up to protect against heat and flying embers. Wear long pants, a long-sleeved shirt, heavy shoes/boots, cap/hat, a dry bandana for face cover, goggles, or glasses. Clothing made of 100% cotton is preferable.
- ○ Locate your pets and take them with you.

WHEN TO EVACUATE

Leave when evacuation is recommended by fire officials to avoid being caught in fire, smoke, or road congestion. You don't need to wait to be ordered by authorities to evacuate. In an intense wildfire, emergency personnel may not have time to knock on every door. If you feel you are in danger, the best course of action is to evacuate. If you are advised to leave, don't hesitate!

Officials will determine the areas to be evacuated and escape routes to use depending upon the fire's location, behavior, winds, terrain, etc.

Law enforcement agencies are typically responsible for enforcing an evacuation order. Follow their directions promptly.

You will be advised of potential evacuations as early as possible. You must take the initiative to stay informed and aware. Listen to your radio/TV for announcements from law enforcement and emergency personnel.

You may be directed to temporary assembly areas to await transfer to a safe location.

The terms "Warning" and "Order" are used to describe evacuation orders. However, local jurisdictions may use other terminology such as "Precautionary" and "Immediate Threat." These terms are used to alert you to the significance of the danger. All evacuation instructions provided by officials should be followed immediately for your safety.

ANIMAL EVACUATION

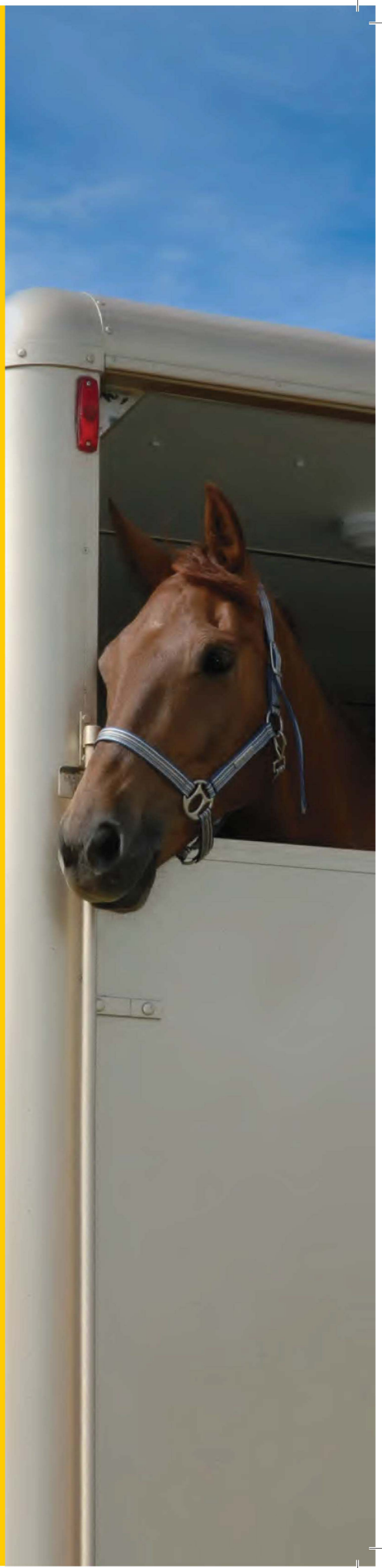
You've taken steps to help keep your family and home fire safe. Don't forget your pets and livestock. With some advanced planning, you can increase their chances of surviving a wildfire.

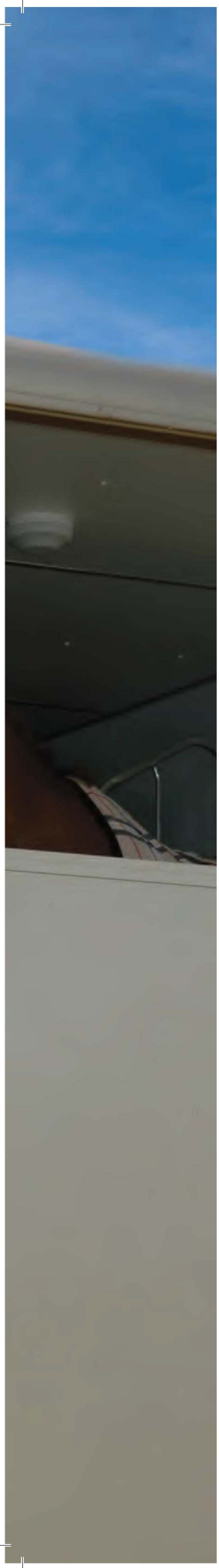
1. Clear Defensible Space around your barns, pastures, and property just as you do your home.
2. Contact your local fairgrounds, stockyards, equestrian centers, friends, etc. about their policies and ability to temporarily take livestock in an emergency.
3. Have vaccination/medical records, registration papers, and photographs of your animals (proof of ownership).
4. If you must leave your animals, leave them in a pre-selected, cleared area. If appropriate, leave enough hay for 48 to 72 hours.
   - Leave water for your animals. Do not rely on automatic watering systems, as a power outage could occur or the water system become compromised.
5. Arrange in advance for a neighbor to check on or transport your pets in case you are not home when disaster strikes.
   - Make sure your neighbors have your contact numbers (cell phone, work, home, etc.).
6. Make sure that each animal has its own pet carrier, as appropriate.
   - Birds, rodents, and reptiles should be transported in cages covered with a light sheet or cloth to minimize their fear.
7. Make sure your pets are always wearing properly fitted collars with personal identification, rabies and license tags.
8. Plan where you will take your pets and select an alternate prearranged location as well.
   - In the event of evacuation, pets may not be allowed inside human emergency shelters.
9. Prepare your livestock disaster preparedness kit.
10. Prepare your pet disaster preparedness kit.

Scan the QR code below to find what items to include in your livestock and pet disaster preparedness kit.

LIVESTOCK AND PET DISASTER PREPAREDNESS KIT INSTRUCTIONS

ReadyforWildfire.org/animal-evacuation





WHAT TO DO IF TRAPPED

WHILE IN YOUR VEHICLE:

- Stay calm.
- Park your vehicle in an area clear of vegetation.
- Close all vehicle windows and vents. If possible, cover inside of windows with a wool or cotton blanket to minimize radiant heat.
- Cover yourself with a wool or cotton blanket or jacket.
- Lie on vehicle floor.
- Use your cell phone to contact officials—**Call 911**

WHILE ON FOOT:

- Stay calm.
- Go to an area clear of vegetation, a ditch, or depression on level ground, if possible.
- Lie face down and cover up your body.
- If near a body of water—pool, creek, pond, lake, etc.—seek safety in the water or use it to keep distance away from the fire. Be careful not to be swept away by moving water or get too deep.
- Use your cell phone to contact officials—**Call 911**

WHILE IN YOUR HOME:

- Stay calm and keep your family together.
- **Call 911** and inform authorities of your location.
- Fill sinks and tubs with cold water.
- Keep doors and windows closed but unlocked.
- Stay inside your house.
- Stay away from outside walls and windows.
- Turn on lights so emergency officials know you are inside.

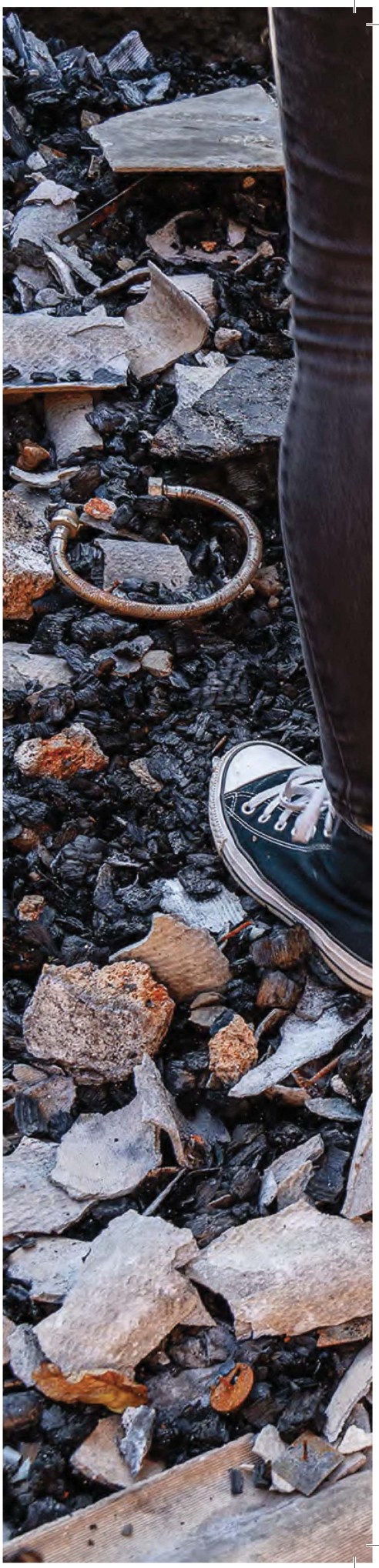
RETURNING HOME AFTER A WILDFIRE

ALWAYS check with officials before attempting to return to your home after a wildfire. Once home, check for the following:

- ○ **Call 911** if any danger is perceived.
- ○ Before inspecting your home, first check for the smell of gas. Turn off power until you've completed your inspection. Use a battery-powered flashlight to inspect a damaged home.
- ○ Check grounds for hot spots, smoldering stumps, and vegetation.
- ○ Check the roof and exterior areas for sparks or embers.
- ○ Check the attic and throughout your house for any hidden burning sparks or embers.
- ○ Check for fire damage to your home, turn off all appliances, and make sure the meter is not damaged before turning on the main circuit breaker.
- ○ Check the well or pump house to ensure it is in working order.
- ○ Do not drink or use water from the faucet until emergency officials say it is okay.
- ○ Discard any food that has been exposed to heat, smoke, or soot.
- ○ Consult local experts on the best way to restore and plant your land with fire smart landscaping.

Be aware of the following dangers that exist after a wildfire:

- Flash floods are a very real and potentially deadly hazard when rain occurs in heavily burned areas after a wildfire. Stay away from burned forests, storm channels, and natural drainages.
- Use extreme caution around trees, power poles, and other tall objects or structures that may have lost stability during the fire.



ReadyforWildfire.org
CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
CAL FIRE
SINCE 1885

Appendix B
Federal Preparedness Resources

Additional Items to Consider Adding to an Emergency Supply Kit:

- ❑ **Prescription medications and glasses**
- ❑ **Infant formula and diapers**
- ❑ **Pet food and extra water for your pet**
- ❑ **Important family documents such as copies of insurance policies, identification and bank account records in a waterproof, portable container**
- ❑ **Cash or traveler's checks and change**
- ❑ **Emergency reference material such as a first aid book or information from www.ready.gov**
- ❑ **Sleeping bag or warm blanket for each person. Consider additional bedding if you live in a cold-weather climate.**
- ❑ **Complete change of clothing including a long sleeved shirt, long pants and sturdy shoes. Consider additional clothing if you live in a cold-weather climate.**
- ❑ **Household chlorine bleach and medicine dropper** – When diluted nine parts water to one part bleach, bleach can be used as a disinfectant. Or in an emergency, you can use it to treat water by using 16 drops of regular household liquid bleach per gallon of water. Do not use scented, color safe or bleaches with added cleaners.
- ❑ **Fire Extinguisher**
- ❑ **Matches in a waterproof container**
- ❑ **Feminine supplies and personal hygiene items**
- ❑ **Mess kits, paper cups, plates and plastic utensils, paper towels**
- ❑ **Paper and pencil**
- ❑ **Books, games, puzzles or other activities for children**

Ready

Prepare. Plan. Stay Informed.®

Emergency Supply List

FEMA

www.ready.gov

Recommended Items to Include in a Basic Emergency Supply Kit:

- **Water, one gallon of water per person per day for at least three days, for drinking and sanitation**
- **Food, at least a three-day supply of non-perishable food**
- **Battery-powered or hand crank radio and a NOAA Weather Radio with tone alert and extra batteries for both**
- **Flashlight and extra batteries**
- **First aid kit**
- **Whistle to signal for help**
- **Dust mask, to help filter contaminated air and plastic sheeting and duct tape to shelter-in-place**
- **Moist towelettes, garbage bags and plastic ties for personal sanitation**
- **Wrench or pliers to turn off utilities**
- **Can opener for food (if kit contains canned food)**
- **Local maps**

Through its *Ready* Campaign, the Federal Emergency Management Agency educates and empowers Americans to take some simple steps to prepare for and respond to potential emergencies, including natural disasters and terrorist attacks. *Ready* asks individuals to do three key things: get an emergency supply kit, make a family emergency plan, and be informed about the different types of emergencies that could occur and their appropriate responses.

All Americans should have some basic supplies on hand in order to survive for at least three days if an emergency occurs. Following is a listing of some basic items that every emergency supply kit should include. However, it is important that individuals review this list and consider where they live and the unique needs of their family in order to create an emergency supply kit that will meet these needs. Individuals should also consider having at least two emergency supply kits, one full kit at home and smaller portable kits in their workplace, vehicle or other places they spend time.

Ready FEMA

Federal Emergency Management Agency
Washington, DC 20472

BE SMART. TAKE PART. CREATE YOUR FAMILY EMERGENCY COMMUNICATION PLAN

Join with others to prepare for emergencies and participate in America's PrepareAthon! | ready.gov/prepare

Creating your *Family Emergency Communication Plan* starts with one simple question: "What if?"

"What if something happens and I'm not with my family?" "Will I be able to reach them?" "How will I know they are safe?" "How can I let them know I'm OK?" During a disaster, you will need to send and receive information from your family.

Communication networks, such as mobile phones and computers, could be unreliable during disasters, and electricity could be disrupted. Planning in advance will help ensure that all the members of your household—including children and people with disabilities and others with access and functional needs, as well as outside caregivers—know how to reach each other and where to meet up in an emergency. Planning starts with three easy steps:

1. COLLECT.

Create a paper copy of the contact information for your family and other important people/offices, such as medical facilities, doctors, schools, or service providers.

2. SHARE.

Make sure everyone carries a copy in his or her backpack, purse, or wallet. If you complete your *Family Emergency Communication Plan* online at ready.gov/make-a-plan, you can print it onto a wallet-sized card. You should also post a copy in a central location in your home, such as your refrigerator or family bulletin board.

3. PRACTICE.

Have regular household meetings to review and practice your plan.

TEXT IS BEST!

If you are using a mobile phone, a text message may get through when a phone call will not. This is because a text message requires far less bandwidth than a phone call. Text messages may also save and then send automatically as soon as capacity becomes available.

The following sections will guide you through the process to create and practice your *Family Emergency Communication Plan*.

HOUSEHOLD INFORMATION

Write down phone numbers and email addresses for everyone in your household. Having this important information written down will help you reconnect with others in case you don't have your mobile device or computer with you or if the battery runs down. If you have a household member(s) who is Deaf or hard of hearing, or who has a speech disability and uses traditional or video relay service (VRS), include information on how to connect through relay services on a landline phone, mobile device, or computer.

SCHOOL, CHILDCARE, CAREGIVER, AND WORKPLACE EMERGENCY PLANS

Because a disaster can strike during school or work hours, you need to know their emergency response plans and how to stay informed. Discuss these plans with children, and let them know who could pick them up in an emergency. Make sure your household members with phones are signed up for alerts and warnings from their school, workplace, and/or local government. To find out more about how to sign up, see *Be Smart. Know Your Alerts and Warnings* at http://1.usa.gov/1BDloze. For children without mobile phones, make sure they know to follow instructions from a responsible adult, such as a teacher or principal.

OUT-OF-TOWN CONTACT

It is also important to identify someone outside of your community or State who can act as a central point of contact to help your household reconnect. In a disaster, it may be easier to make a long-distance phone call than to call across town because local phone lines can be jammed.

EMERGENCY MEETING PLACES

Decide on safe, familiar places where your family can go for protection or to reunite. Make sure these locations are accessible for household members with disabilities or access and functional needs. If you have pets or service animals, think about animal-friendly locations. Identify the following places:

- ☐ *Indoor*: If you live in an area where tornadoes, hurricanes, or other high-wind storms can happen, make sure everyone knows where to go for protection. This could be a small, interior, windowless room, such as a closet or bathroom, on the lowest level of a sturdy building, or a tornado safe room or storm shelter.
- ☐ *In your neighborhood*: This is a place in your neighborhood where your household members will meet if there is a fire or other emergency and you need to leave your home. The meeting place could be a big tree, a mailbox at the end of the driveway, or a neighbor's house.
- ☐ *Outside of your neighborhood*: This is a place where your family will meet if a disaster happens when you're not at home and you can't get back to your home. This could be a library, community center, house of worship, or family friend's home.

- [ ] *Outside of your town or city*: Having an out-of-town meeting place can help you reunite if a disaster happens and:

  - You cannot get home or to your out-of-neighborhood meeting place; or
  - Your family is not together and your community is instructed to evacuate the area.

  This meeting place could be the home of a relative or family friend. Make sure everyone knows the address of the meeting place and discuss ways you would get there.

OTHER IMPORTANT NUMBERS AND INFORMATION

You should also write down phone numbers for emergency services, utilities, service providers, medical providers, veterinarians, insurance companies, and other services.

SHARE

MAKE SURE EVERYONE HAS THE INFORMATION

- [ ] Make copies of your *Family Emergency Communication Plan* for each member of the household to carry in his or her wallet, backpack, or purse. Post a copy in a central place at home. Regularly check to make sure your household members are carrying their plan with them.
- [ ] Enter household and emergency contact information into all household members' mobile phones or devices.
- [ ] Store at least one emergency contact under the name "In Case of Emergency" or "ICE" for all mobile phones and devices. This will help someone identify your emergency contact if needed. Inform your emergency contact of any medical issues or other requirements you may have.
- [ ] Create a group list on all mobile phones and devices of the people you would need to communicate with if there was an emergency or disaster.
- [ ] Make sure all household members and your out-of-town contact know how to text if they have a mobile phone or device, or know alternative ways to communicate if they are unable to text.
- [ ] Read *Be Smart. Know Your Alerts and Warnings* at http://1.usa.gov/1BDloze and sign up to receive emergency information.

NOW IT'S TIME TO PRACTICE!

Once you have completed your *Family Emergency Communication Plan*, made copies for all the members of your household, and discussed it, it's time to practice!

Here are some ideas for practicing your plan:

- [ ] Practice texting and calling. Have each person practice sending a text message or calling your out-of-town contact and sending a group text to your mobile phone group list.
- [ ] Discuss what information you should send by text. You will want to let others know you are safe and where you are. Short messages like "I'm OK. At library" are good.

- [ ] Talk about who will be the lead person to send out information about the designated meeting place for the household.
- [ ] Practice gathering all household members at your indoor and neighborhood emergency meeting places. Talk about how each person would get to the identified out-of-neighborhood and out-of-town meeting places. Discuss all modes of transportation, such as public transportation, rail, and para-transit for all family members, including people with disabilities and others with access and functional needs.
- [ ] Regularly have conversations with household members and friends about the plan, such as whom and how to text or call, and where to go.
- [ ] To show why it's important to keep phone numbers written down, challenge your household members to recite important phone numbers from memory—now ask them to think about doing this in the event of an emergency.
- [ ] Make sure everyone, including children, knows how and when to call 911 for help. You should only call 911 when there is a life-threatening emergency.
- [ ] Review, update, and practice your *Family Emergency Communication Plan* at least once a year, or whenever any of your information changes.

To help start the conversation or remind your family why you are taking steps to prepare and practice, you may want to watch the 4-minute video, *It Started Like Any Other Day*, about families who have experienced disaster, at www.youtube.com/watch?v=w_omgt3MEBs. Click on the closed captioning (CC) icon on the lower right to turn on the captioning.

After you practice, talk about how it went. What worked well? What can be improved? What information, if any, needs to be updated? If you make updates, remember to print new copies of the plan for everyone.

OTHER IMPORTANT TIPS FOR COMMUNICATING IN DISASTERS[1]

- [ ] Text is best when using a mobile phone, but if you make a phone call, keep it brief and convey only vital information to emergency personnel and/or family or household members. This will minimize network congestion, free up space on the network for emergency communications, and conserve battery power. Wait 10 seconds before redialing a number. If you redial too quickly, the data from the handset to the cell sites do not have enough time to clear before you've re-sent the same data. This contributes to a clogged network.
- [ ] Conserve your mobile phone battery by reducing the brightness of your screen, placing your phone in airplane mode, and closing apps you do not need. Limit watching videos and playing video games to help reduce network congestion.
- [ ] Keep charged batteries, a car phone charger, and a solar charger available for backup power for your mobile phone, teletypewriters (TTYs), amplified phones, and caption phones. If you charge your phone in your car, be sure the car is in a well-ventilated area (e.g., not in a closed garage) to avoid life-threatening carbon monoxide poisoning.

[1] Federal Communications Commission, Public Safety and Homeland Security Bureau. (n.d.) *Tips for communicating in an emergency.* Retrieved from http://transition.fcc.gov/pshs/emergency-information/tips.html

- [ ] If driving, do not text, read texts, or make a call without a hands-free device.
- [ ] Maintain a household landline and analog phone (with battery backup if it has a cordless receiver) that can be used when mobile phone service is unavailable. Those who are Deaf or hard of hearing, or who have speech disabilities and use devices and services that depend on digital technology (e.g., VRS, Internet Protocol [IP] Relay, or captioning) should have an analog phone (e.g., TTY, amplified phone, or caption phone) with battery backup in case Internet or mobile service is down.
- [ ] If you evacuate and have a call-forwarding feature on your home phone, forward your home phone number to your mobile phone number.
- [ ] Use the Internet to communicate by email, Twitter, Facebook, and other social media networks. These communication channels allow you to share information quickly with a widespread audience or to find out if loved ones are OK. The Internet can also be used for telephone calls through Voice over Internet Protocol. For those who are Deaf or hard of hearing, or who have speech disabilities, you can make calls through your IP Relay provider.
- [ ] If you do not have a mobile phone, keep a prepaid phone card to use if needed during or after a disaster.
- [ ] Use a pay phone if available. It may have less congestion because these phones don't rely on electricity or mobile networks. In some public places, you may be able to find a TTY that can be used by those who are Deaf or hard of hearing, or who have speech disabilities.

America's PrepareAthon! is a grassroots campaign for action to get more people prepared for emergencies. Make your actions count at ready.gov/prepare.

The reader recognizes that the Federal Government provides links and informational data on various disaster preparedness resources and events and does not endorse any non-Federal events, entities, organizations, services, or products.

10 WAYS TO PARTICIPATE IN AMERICA'S PrepareAthon!℠

Access Alerts and Warnings

Test Communication Plans

Assemble or Update Supplies

Drill or Practice Emergency Response

Participate in a Class, Training, or Discussion

Plan with Neighbors

Conduct an Exercise

Make Property Safer

Document and Insure Property

Safeguard Documents

FAMILY EMERGENCY COMMUNICATION PLAN

HOUSEHOLD INFORMATION

Home #: .....
Address: .....

Name: ..... Mobile #: .....
Other # or social media: .....
Email: .....
Important medical or other information: .....
.....

Name: ..... Mobile #: .....
Other # or social media: .....
Email: .....
Important medical or other information: .....
.....

Name: ..... Mobile #: .....
Other # or social media: .....
Email: .....
Important medical or other information: .....
.....

Name: ..... Mobile #: .....
Other # or social media: .....
Email: .....
Important medical or other information: .....
.....

SCHOOL, CHILDCARE, CAREGIVER, AND WORKPLACE EMERGENCY PLANS

Name: .....
Address: .....
Emergency/Hotline #: .....
Website: .....
Emergency Plan/Pick-Up: .....

SCHOOL, CHILDCARE, CAREGIVER, AND WORKPLACE EMERGENCY PLANS

Name: .....
Address: .....
Emergency/Hotline #: .....
Website: .....
Emergency Plan/Pick-Up: .....

Name: .....
Address: .....
Emergency/Hotline #: .....
Website: .....
Emergency Plan/Pick-Up: .....

Name: .....
Address: .....
Emergency/Hotline #: .....
Website: .....
Emergency Plan/Pick-Up: .....

IN CASE OF EMERGENCY (ICE) CONTACT

Name: ..... Mobile #: .....
Home #: .....Email: .....
Address: .....

OUT-OF-TOWN CONTACT

Name: ..... Mobile #: .....
Home #: .....Email: .....
Address: .....

EMERGENCY MEETING PLACES

Indoor: .....
Instructions: .....
Neighborhood: .....
Instructions: .....

Out-of-Neighborhood: .....
Address: .....
Instructions: .....

Out-of-Town: .....
Address: .....
Instructions: .....

IMPORTANT NUMBERS OR INFORMATION

Police: ..... Dial 911 or #: .....
Fire: ..... Dial 911 or #: .....
Poison Control: .....#: .....
Doctor: .....#: .....
Doctor: .....#: .....
Pediatrician: .....#: .....
Dentist: .....#: .....
Hospital/Clinic: .....#: .....
Pharmacy: .....#: .....
Medical Insurance: .....#: .....
Policy #: .....
Medical Insurance: .....#: .....
Policy #: .....
Homeowner/Rental Insurance: .....
#: .....
Policy #: .....
Flood Insurance: .....#: .....
Policy #: .....
Veterinarian: .....#: .....
Kennel: .....#: .....
Electric Company: .....#: .....
Gas Company: .....#: .....
Water Company: .....#: .....
Alternate/Accessible Transportation: .....
#: .....
Other: .....#: .....
Other: .....#: .....
Other: .....#: .....

AMERICA'S PrepareAthon!
BE SMART. TAKE PART. PREPARE.

Ready

Write your family's name above

Family Emergency Communication Plan

IN CASE OF EMERGENCY (ICE) CONTACT

Name: ..... Mobile #: .....
Home #: ..... Email: .....
Address: .....

OUT-OF-TOWN CONTACT

Name: ..... Mobile #: .....
Home #: ..... Email: .....
Address: .....

FOLD HERE

HOUSEHOLD INFORMATION

Home #: .....
Address: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information .....

FOLD HERE

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

Name: ..... Mobile #: .....
Other # or social media: ..... Email: .....
Important medical or other information: .....

FOLD HERE

SCHOOL, CHILDCARE , CAREGIVER, AND WORKPLACE EMERGENCY PLANS

Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

FOLD HERE

Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

Name: .....
Address: .....
Emergency/Hotline #: ..... Website: .....
Emergency Plan/Pick-Up: .....

EMERGENCY MEETING PLACES

Indoor: .....
Instructions: .....
.....

Neighborhood: .....
Instructions: .....
.....

Out-of-Neighborhood: .....
Address: .....
Instructions: .....
.....

Out-of-Town: .....
Address: .....
Instructions: .....
.....

IMPORTANT NUMBERS OR INFORMATION

Police: ..... Dial 911 or #: .....
Fire: ..... Dial 911 or #: .....
Poison Control: ..... #: .....
Doctor: ..... #: .....
Doctor: ..... #: .....
Pediatrician: ..... #: .....
Dentist: ..... #: .....
Medical Insurance: ..... #: .....
Policy #: .....
Medical Insurance: ..... #: .....
Policy #: .....
Hospital/Clinic: ..... #: .....

Pharmacy: ..... #: .....
Homeowner/Rental Insurance: ..... #: .....
Policy #: .....
Flood Insurance: ..... #: .....
Policy #: .....
Veterinarian: ..... #: .....
Kennel: ..... #: .....
Electric Company: ..... #: .....
Gas Company: ..... #: .....
Water Company: ..... #: .....
Alternate/Accessible Transportation: ..... #: .....
Other: .....
Other: .....

American Red Cross

Family Disaster Plan

Family Last Name(s) or Household Address: **Date:**

Family Member/Household Contact Info (If needed, additional space is provided in #10 below):

Name	Home Phone	Cell Phone	Email:

Pet(s) Info:

Name:	Type:	Color:	Registration #:

Plan of Action

1. The disasters most likely to affect our household are:

2. What are the escape routes from our home?

3. If separated during an emergency, what is our meeting place near our home?

4. If we cannot return home or are asked to evacuate, what is our meeting place outside of our neighborhood?

_____

What is our route to get there and an alternate route, if the first route is impassible?

_____

_____

5. In the event our household is separated or unable to communicate with each other, our emergency contact outside of our immediate area is:

Name	Home Phone	Cell Phone	Email:
_____	_____	_____	_____

After a disaster, let your friends and family know you are okay by registering at "Safe and Well" at https://safeandwell.communityos.org/cms// or by calling 1-800-733-2767. You can also give them a call, send a quick text or update your status on social networking sites.

6. If at school/daycare, our child(ren) will be evacuated to:

Child's Name:	Evacuation Site (address and contact info):
_____	_____
_____	_____
_____	_____
_____	_____

7. Our plan for people in our household with a disability or special need is:

Person's Name:	Plan:
_____	_____
_____	_____

8. During certain emergencies local authorities may direct us to "shelter in place" in our home. An accessible, safe room where we can go, seal windows, vents and doors and listen to emergency broadcasts for instructions, is:

_____

9. Family Member Responsibilities in the Event of a Disaster

Task	Description	Family Member Responsible
Disaster Kit*	Stock the disaster kit and take it if evacuation is necessary. Include items you might want to take to an evacuation shelter. Remember to include medications and eye glasses.	
Be informed	Maintain access to NOAA or local radio, TV, email or text alerts for important and current information about disasters.	
Family Medical Information	Make sure the household medical information is taken with us if evacuation is necessary.	
Financial Information	Obtain copies of bank statements and cash in the event ATMs and credit cards do not work due to power outages. Bring copies of utility bills as proof of residence in applying for assistance.	
Pet Information	Evacuate our pet(s), keep a phone list of pet-friendly motels and animal shelters, and assemble and take the pet disaster kit.	
Sharing and Maintaining the Plan	Share the completed plan with those who need to know. Meet with household members every 6 months or as needs change to update household plan.	

**What supplies and records should go in your disaster kit? Visit www.redcross.org*

10. Other information, if not able to be included above.

Congratulations on completing your family disaster plan! Please tell others: "We've made a family disaster plan and you can, too, with help from the American Red Cross."

Get the facts about what you should do if an emergency or disaster occurs at www.redcross.org

Appendix C
Evacuation Modeling

TO:	Mike Huff; Dudek Austin Ott, Dudek
FROM:	Phuong Nguyen, PE; CR Associates (CRA)
DATE:	January 9, 2025
RE:	Beaumont Heights Fire Evacuation Analysis – Technical Memorandum

The purpose of this technical memorandum, which was prepared in coordination with the fire professionals at Dudek, is to assess the time required for emergency evacuation from the site of the Beaumont Heights Project (the "Project"), under several scenarios, assuming a wind-driven fire that results in a required evacuation affecting the project site and surrounding community.[1] The purpose of the traffic evacuation simulations and related analysis presented here is to identify the vehicle travel times required under the various simulated evacuation events.

Background and Purpose

This memorandum provides a summary of the various traffic simulation analyses conducted relative to evacuation of the Project site and surrounding community due to a wildfire. The simulations have been conducted for a variety of evacuation scenarios described below. Modeling potential evacuation traffic impacts requires that numerous assumptions be made to address the many variables that would impact a real-life evacuation scenario, including the number of existing vehicles in the community, the number of project vehicles that will need to evacuate, the roadway capacities and whether enhancements are provided (e.g., extra lanes, lane widening, signaling intersections), the total number of intersections and how they will be operating, the final destination, the targeted evacuation area, the total mobilization time, vegetation communities, weather and wind, fire spread rates, humidity, topography, risk to homes, locations of ignitions and new fire starts, lead time needed, etc. There are thousands of potential model scenarios, and each fire scenario poses variations that regularly change and would be reassessed "real-time" during a wildfire. Agencies involved in implementing an evacuation order may be informed by the project-specific modeling in this memorandum but will also rely on situational awareness and wildfire pre-plans, which act as operational tools to provide high-level fire assessments of assets at risk, preferred evacuation approaches, and safety information to inform evacuation decision-making.

The following analysis is intended to present representative evacuation scenarios using a data driven approach, conservative assumptions, and the modeling technology considered to be industry leading and most applicable to the conditions being analyzed[2]. In an actual emergency, fire command will take into account numerous factors including fire location and spread rates, wind speeds and direction, humidity, topography, fuel loading, emergency access routes, evacuation routes, time needed to evacuate, and other variables, and will issue specific directives consistent with the process and protocols outlined in the County of Riverside's and the City of Beaumont Emergency Operations Plans. The evacuation traffic model used herein is appropriate for planning and comparison purposes and would provide useful information to agencies and emergency managers regarding evacuation timeframes for purposes of informing managers' issuance of specific evacuation orders. For that reason, it will be provided to agencies and emergency managers; however, during a wildfire, employees, residents, and visitors should comply with directives from authorities and first responders conducting the evacuation or emergency response, not rely on this evacuation traffic model.

[1] This memorandum was prepared with technical input regarding fire behavior from Dudek's fire protection planning team.
[2] This evacuation analysis was conducted using the Vissim microsimulation software, which is one of the leading microsimulation software models available that can accurately replicate human driving behavior during an evacuation, including yielding at a congested location and delay due to stop & go traffic.

This technical memorandum and the accompanying analyses were prepared in accordance with the California Governor's Office of Planning and Research Fire Hazard Planning Technical Advisory, the California Office of the Attorney General's Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under CEQA, and guidance for determining evacuation times. The analysis also incorporates relevant information from the County of Riverside Emergency Operations Plan, the City of Beaumont Emergency Operation Plan, and associated annexes.

The scenarios analyzed in this study are informed by a review of local fire history and lessons learned from recent events, including the Bogart Fire (2016), Manzanita Fire (2017), Palmer Fire (2017), Beaumont Fire (2019), Apple Fire (2020), Highland Fire (2023), as well as the Palisades, Eaton, Kenneth, and Hughes Fires in 2025.

Advancements in fire behavior science, combined with improved understanding of area topography, fuel types, and the integration of new technologies, have led to a more refined approach to evacuations. Recent wildfire events have increasingly relied on targeted and strategic evacuations, as opposed to the widespread, area-wide mass evacuations that were standard protocol prior to approximately 2015. Although targeted evacuations represent the current best practice, it is important to acknowledge the presence of "shadow evacuees," which refers to individuals who choose to evacuate without receiving an official evacuation order. The proportion of shadow evacuees is highly *uncertain and may range from 25 percent to 75 percent. Therefore, to ensure a conservative analysis,* this study assumes a mass evacuation scenario.

The evacuation analysis is based on conservative assumptions intended to represent a worst-case scenario. Specifically, the analysis assumes a Saturday afternoon when the Project is operating at full capacity, all nearby residents are at home and surrounding industrial and retail uses are fully open and occupied at the time the evacuation order is issued. While CEQA only requires that reasonable scenarios be analyzed, this more extreme case was selected as an added precaution to prioritize public safety.

In practice, the actual number of evacuees would likely be lower depending on the timing of the evacuation order. For example, if an evacuation were ordered during a weekday afternoon, early morning, or late evening, there would likely be fewer people present in the area. According to the Institute of Transportation Engineers Parking Generation Manual, sixth edition, time of day parking demand varies substantially by land use. Residential areas typically experience peak parking demand, and therefore the highest number of vehicles is present, in the late evening and early morning. Industrial uses tend to peak during the late morning and early afternoon. As a result, the actual number of vehicles requiring evacuation and the total evacuation time may be significantly less than what is reported in this analysis, depending on when the evacuation is ordered.

The roadway network and vehicle input assumptions were selected to represent a "worst-case" evacuation scenario, specifically, a Saturday afternoon when the Project is operating at full capacity, all residents of adjacent communities are at home, and nearby industrial and retail land uses are fully active at the moment the evacuation order is issued. While CEQA does not require analysis of such an extreme scenario, only those reasonable standards and criterion be applied, whereas this analysis adopts a more conservative approach as an added precaution. During an actual wildfire event, it is likely that not all residents would be present in the surrounding communities, and the Project's parking lot would not be at full occupancy. Except of the time-of-day parking demands are provided in Attachment A.

Project Description

The proposed Project involves the development of four industrial buildings along with associated site improvements. Since the future tenants of the Project are currently unknown, the Environmental Impact Report (EIR) and this evacuation analysis are based on maximum development assumptions to accommodate a range of potential future tenants. Accordingly, this evacuation analysis is based on a conservative assumption of building square footage that exceeds the currently proposed development area. A comparison of the assumed and proposed square footage is provided in **Table 1**.

Table 1 – Studied vs. September 2025 Site Plan Square Footage

Building	Studied (SF)	9/24/2025 Project Site Plan (SF)
1	688,200	636,937
2	1,488,600	1,386,044
3	1,675,600	1,488,920
4	1,847,600	1,666,305

Primary site access for all buildings will be from Beaumont Avenue (SR-79), with one access point aligned with the existing California Avenue and a second future driveway proposed between Buildings 2 and 3, both designed for full access. Project development is planned to occur in four phases, moving from north to south, over the period from 2027 to 2045.

The TA provides a comprehensive analysis of each of the development phases, and includes the the following scenarios:

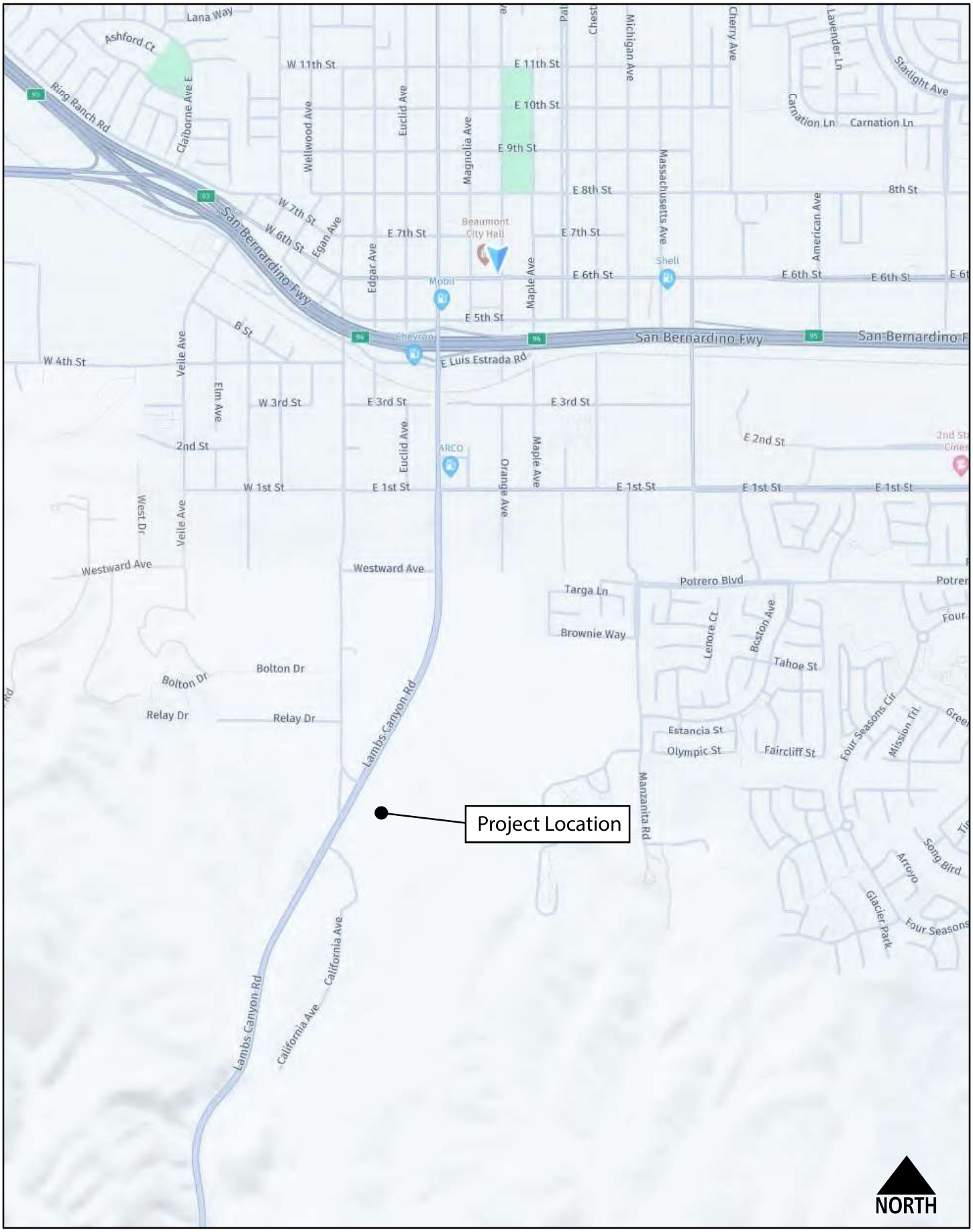
- Existing (2024) Conditions
- Background (2027) Conditions
- Background (2027 – Phase 1) With Project Conditions
- Background (2029) Conditions
- Background (2029 – Phase 1 + Phase 2) With Project Conditions
- Background (2030) Conditions
- Background (2030 – Phase 1 through Phase 3) With Project Conditions
- Background (2032) Conditions
- Background (2032 – Phase 1 through Phase 4 or Project Buildout) With Project Conditions
- Cumulative No Project Conditions (2045)
- Cumulative With Project Conditions (2045 – Project Buildout)

As shown, the TA includes a total of 11 different scenarios, whereas the evacuation analysis focuses on later phases when the project is more fully built out and would generate the greatest number of vehicles during an evacuation. The evacuation analysis therefore evaluates the following scenarios:

1. Existing (2024) Conditions
2. Background (2030) Conditions
3. Background (2030 – Phase 1 through Phase 3) With Project Conditions
4. Cumulative No Project Conditions (2045)
5. Cumulative With Project Conditions (2045 – Project Buildout)

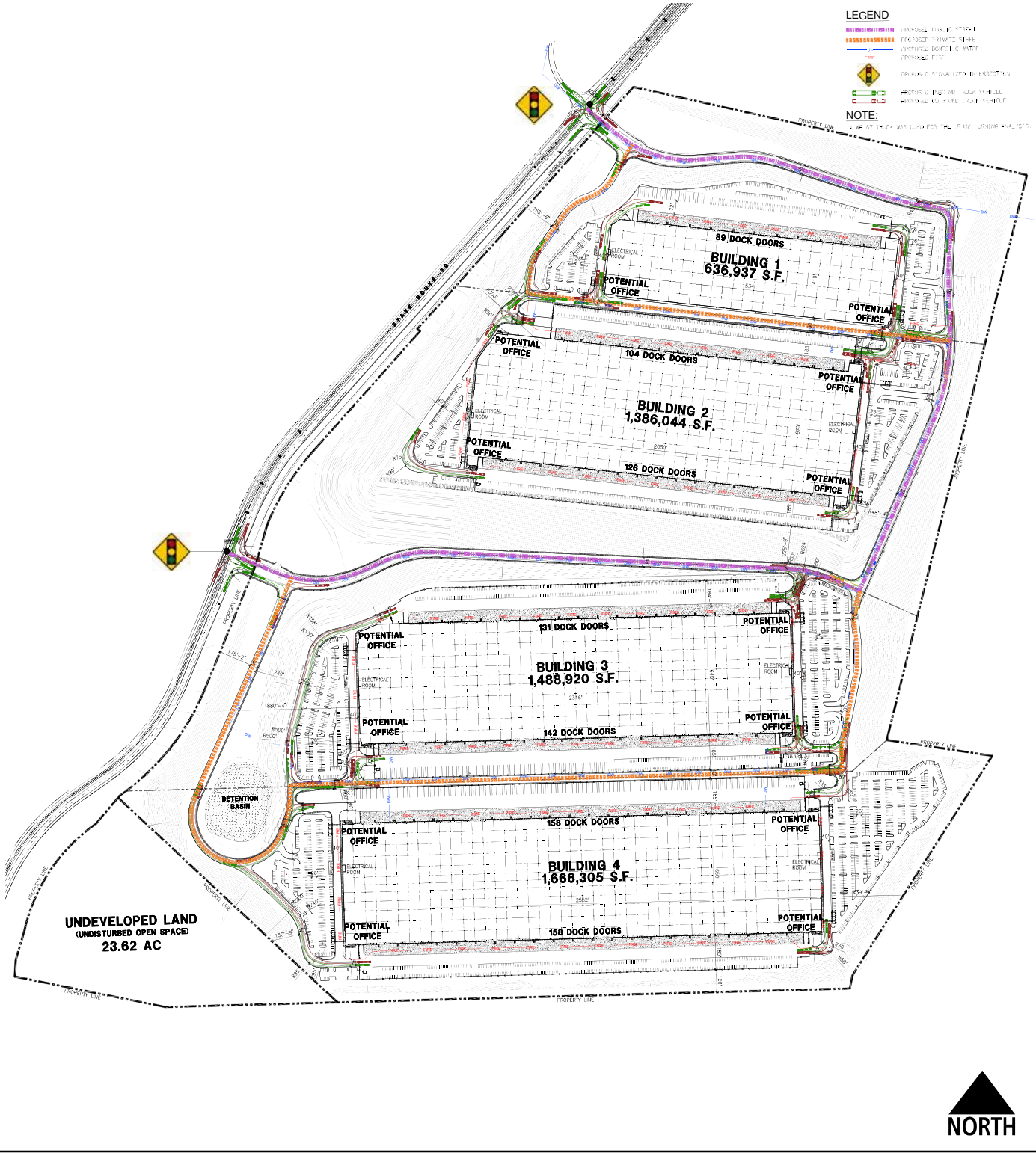
The evacuation analysis incorporates the same set of cumulative projects and roadway improvements as those evaluated in the traffic analysis. Given the uncertainty surrounding the timing of cumulative project development, it is conservatively assumed that all such projects will be fully built and occupied by the year 2030. Additional descriptions of each scenario are provided in subsequent sections.

Figure 1 displays the proposed Project location and **Figure 2** displays the proposed Project site plan.



Beaumont Heights Fire Evacuation Analysis
Technical Memorandum

Figure 1
Project Location



Beaumont Heights Fire Evacuation Analysis
Technical Memorandum

Figure 2
Project Site Plan

Methodological Approach

This evacuation analysis was performed for the Project to estimate the approximate time required for employees, visitors, residents of the Project, and surrounding community members to evacuate to nearby urban areas in the event of a wildfire emergency. In practice, evacuation strategies are highly dependent on the scale, location, and progression of a wildfire. Current evacuation practice typically targets only the area in immediate danger, which allows for more effective evacuation operations, reduces unnecessary congestion and gridlock, and preserves roadway capacity for emergency response vehicles. Under these typical conditions, first responders and law enforcement personnel actively manage evacuation traffic at key intersections and corridors in accordance with established protocols outlined in the County of Riverside Operational Area Emergency Support Function #16: Evacuation and Re-Entry (Riverside County ESF #16) and the City of Beaumont Emergency Operations Plan (EOP).

Depending on the location and extent of the wildfire, the lead agency for evacuation operations may vary. If a wildfire originates on the west or southwest side of the Project site, within unincorporated Riverside County, it is likely that the County of Riverside Sheriff's Department would serve as the lead agency for evacuation operations. Conversely, if a wildfire originates within the incorporated limits of the City of Beaumont, the City of Beaumont Police Department would typically assume the lead role. However, wildfires frequently cross jurisdictional boundaries, and under such circumstances a joint evacuation operation between the County of Riverside Sheriff's Department and the City of Beaumont Police Department would be implemented. Joint operations, including unified command, coordination procedures, and shared responsibilities, are explicitly outlined in both the County and City EOPs to ensure seamless evacuation management across jurisdictional boundaries.

Riverside County ESF #16 provides a comprehensive framework for managing evacuations and ensuring safe re-entry following emergencies. The purpose of the plan is to guide the coordinated evacuation of people and animals from hazardous areas to areas of safety and applies to all jurisdictions and special districts within the County. While the City of Beaumont EOP does not organize emergency response functions using numbered Emergency Support Functions in the same manner as Riverside County, it does designate an Evacuation and Re-Entry Unit Leader within its Emergency Operations Center structure. This Unit Leader is responsible for directing evacuation and re-entry activities and making operational decisions based on professional judgment, situational awareness, and incident-specific conditions. As a result, although structured differently, the City of Beaumont's evacuation and re-entry approach would be expected to be functionally similar to the processes and objectives outlined in Riverside County ESF #16, including coordinated traffic management, phased evacuations where feasible, and integration with County and regional partners.

Early warning and evacuation timing can vary significantly based on wildfire behavior, fire origin, weather conditions, and available response time. In some cases, particularly where a fire is advancing slowly or forecast conditions indicate a heightened but not immediate threat, early warning notifications may be issued out of an abundance of caution, potentially up to 72 hours in advance. This early notification window allows agencies to coordinate logistics, stage resources, identify shelters, and prepare transportation assets. In other cases, particularly for fast-moving wildfires driven by wind or steep topography, evacuations may be ordered with little or no advance notice, requiring rapid, last-minute evacuation of affected populations.

For the purposes of the evacuation analysis conducted herein, a highly conservative scenario was assumed. The analysis assumes a last-minute evacuation condition in which 100 percent of the affected population evacuates simultaneously, with no advance warning. Due to the assumed short

notice, the analysis further assumes that law enforcement personnel would not be in position to manage traffic or provide intersection control at the onset of evacuation. As a result, vehicles are assumed to compete with one another for available roadway capacity, without active traffic management or prioritized movements. This assumption represents a worst-case and intentionally conservative scenario and is expected to overstate congestion and evacuation times relative to more typical, managed evacuation conditions where phased evacuations, targeted zones, and law enforcement traffic control would be implemented.

When the incident commander (IC) deemed certain areas at risk due to fire conditions, an evacuation order was issued. An evacuation order should be used when there is potential for or an actual threat to civilian life, typically this could range between 1 to 2 hours[3] of such determination or when the IC deems it necessary to protect civilians. The purpose of an evacuation warning, in comparison, is to alert community members in a defined area of a potential threat to life and property from an emergency incident. An evacuation warning may be issued when the potential or actual threat to civilian life is more than 2 hours away.

During the evacuation process, which can proceed aided by the roadside fuel modification zones and unexposed corridors, wildfire progress may be slowed by fire-fighting efforts that would likely include fixed wing and helicopter fire-fighting assets. Hand crews would also be deployed toward containment. Note that none of the evacuation scenarios presented here utilize counter-flow lanes, as these lanes are reserved for first responders, law enforcement, and fire fighters in case of unforeseen circumstances.

Scenario Description

This section provides a description of each of the different evacuation scenarios, including the number of evacuating vehicles for each of the land uses. It is assumed that the proposed Project's evacuation plan would provide clear instructions for response once an evacuation order is issued. Employees are expected to evacuate using their personal vehicles, while operators of heavy vehicles would depart using their tractor units with a single trailer attached. Additionally, it is assumed that law enforcement would restrict all inbound traffic once an evacuation order is in effect.

Determining the evacuation travel time is a common method for evaluating project evacuations as it focuses on the active period when “wheels are rolling”. Note that while some households may leave the area prior to an evacuation order for personal reasons, for a conservative analysis, all scenarios presented here are based on the presumption that all the households and vehicles would leave together once an evacuation order is issued.

As discussed previously, the evacuation analysis in this report evaluates five scenarios: (1) Existing (2024) Conditions, (2) Background (2030) Conditions, (3) Background (2030 – Phase 1 through Phase 3) With Project Conditions, (4) Cumulative No Project Conditions (2045), and (5) Cumulative With Project Conditions (2045 – Project Buildout). Scenarios 1, 2, and 4 represent total evacuating vehicles and evacuation times under “without Project” conditions, while Scenarios 3 and 5 address the “with Project” conditions.

For purposes of the evacuation analysis, it was assumed that a wildfire originates to the south or southwest of the Project site, then spread northward, resulting in a mass evacuation of the Project site and the surrounding area. This assumption was informed by a review of historical wildfire perimeter

[3] ESF #16 does not specify a defined threshold; however, guidance can be inferred from neighboring jurisdictions, such as the San Diego County Operational Area Evacuation and Repopulation Policy #8-B, available at https://sdoparea.org/wp-content/uploads/documents/8B%20Evacuation%20and%20Repopulation.pdf.

data from the CAL FIRE Historical Wildland Fire Perimeters[4] database and the Interagency Wildland Fire Perimeter History[5] dataset. These datasets indicate that wildfires with large footprints that have necessitated mass evacuations in and around the City of Beaumont have historically originated within the wildland–urban interface (WUI) areas to the south and southwest of the City. These areas are generally characterized by rugged terrain, heavier fuel loads, limited roadway access, and longer detection and response times. As a result, fires originating in these areas have a greater potential to grow rapidly before firefighting resources can intervene, increasing the likelihood of widespread evacuations.

While it is technically feasible for a wildfire to originate to the north or northeast of the Project site, these areas are predominantly urbanized and characterized by a dense, grid-like roadway network and higher population density. Such conditions generally allow for faster fire detection, quicker emergency response, and more immediate access for firefighting equipment, thereby reducing the likelihood that a fire would grow to a scale requiring evacuation of the Project site. Although a scenario in which a fire originates to the north or northeast and is subsequently driven southward by Santa Ana wind conditions cannot be entirely discounted, the probability of such an event resulting in a large-scale evacuation is considered lower than that of a fire originating in the more rugged WUI areas with fewer opportunities for early intervention.

Under this assumed scenario, evacuating vehicles are expected to travel generally north toward I-10 and Downtown Beaumont. The analysis area was defined to capture the potential for evacuees from surrounding land uses to utilize the same or adjacent evacuation routes as the Project. Although the primary evacuation route for the Project is SR-79/Beaumont Avenue/California Avenue, it is anticipated that some evacuating traffic from land uses to the west and east could also rely on this corridor to access I-10 and Downtown Beaumont. To ensure a conservative analysis, the study area encompasses all potential evacuation zones, including areas with access to alternative routes.

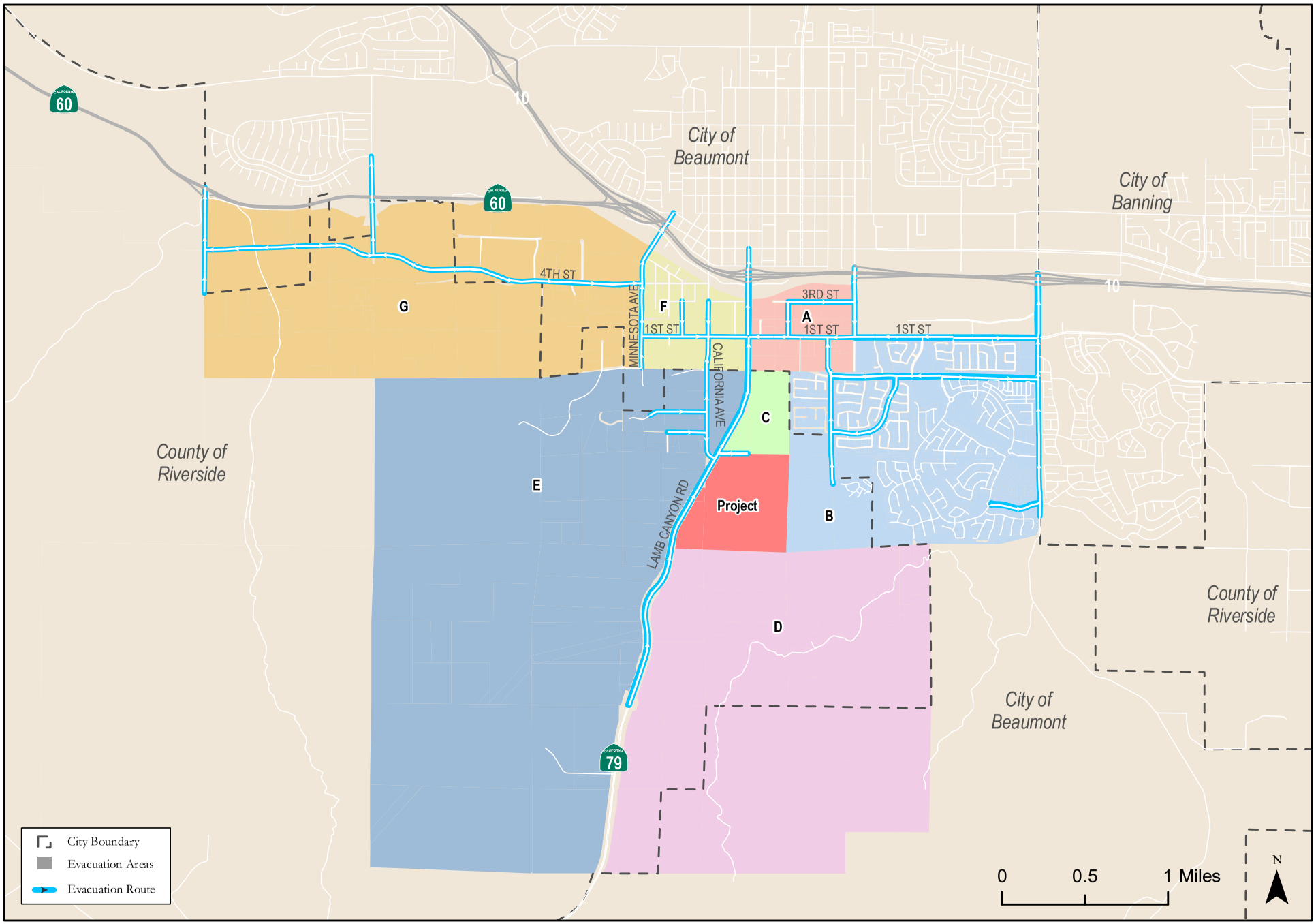
The County of Riverside uses the Genasys Protect Evacuation Zone alert system, which subdivides the evacuation zones listed above into smaller zones for evacuation operations. However, for the purposes of this analysis the larger zones, which in some cases encompass multiple Genasys Protect evacuation zones, were used. Genasys Protect Evacuation Zones were grouped into “evacuation areas,” labeled Area A through Area G. These groupings reflect shared evacuation routes and/or common destinations. For example, Area A includes industrial and certain residential uses that would, during an evacuation, use either Pennsylvania Avenue or SR-79/Beaumont Avenue to reach I-10 and Downtown Beaumont. In contrast, Area B primarily consists of residential uses likely to use Pennsylvania Avenue and South Highland Springs Avenue. Certain sites, such as the Sunlakes Village Shopping Center, were excluded from the analysis, as their evacuation routes do not overlap with those of the Project, and their limited surrounding vegetation makes them less vulnerable[6]. A comparison between the zones used in this analysis and the Genasys Protect Evacuation Zones is provided in Attachment A.

Figure 3 illustrates the evacuation zones within the study area and the corresponding evacuation roadways serving each zone. Evacuation roadways are defined as circulation element roadways that provide outbound access from each evacuation zone.

[4] https://www.arcgis.com/home/item.html?id=c3c10388e3b24cec8a954ba10458039d

[5] https://data-nifc.opendata.arcgis.com/datasets/nifc::interagencyfireperimeterhistory-all-years-view/explore?location=33.917551%2C-116.976151%2C12.41

[6] This does not preclude the possibility that such areas could face an evacuation order under different fire scenarios; however, if a fire is located south of the Project site, it is more likely that Incident Command would prioritize evacuation of land uses in closest proximity to the fire.



Beaumont Heights Fire Evacuation Analysis
Technical Memorandum

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Figure 3
Evacuation Areas and Routes

Evacuating Vehicles

The number of vehicles evacuating under each scenario was calculated based on published industry sources, including the American Community Survey, the Institute of Transportation Engineers (ITE) Parking Generation Manual, and City of Beaumont vehicle ownership statistics. For residential land uses, the total number of evacuating vehicles was determined by multiplying the average vehicle ownership rate for the City of Beaumont, which is 2.2 vehicles per household, by the number of households within each evacuation area. This calculation also accounts for specialized residential uses such as RV parks, where it is assumed that, in addition to the RVs parked onsite, there would be supplementary vehicles present, and that the RV parks would be at full occupancy during an evacuation event.

For industrial and commercial land uses, the number of evacuating vehicles was estimated by multiplying the total building square footage by the applicable average parking rate from the ITE Parking Generation Manual. It is assumed that all parked vehicles would evacuate in response to an evacuation order, resulting in a conservative estimate. Additionally, the proportion of heavy vehicles used in the analysis is consistent with the assumptions from the Traffic Analysis, which indicate that between 4 percent and 5 percent of vehicles in industrial areas are heavy vehicles. This is higher than the standard heavy vehicle percentage of 2 percent[7], which further reinforces the conservative nature of the analysis.

Except for Scenario 1, all other scenarios incorporate cumulative projects identified in the traffic analysis. These cumulative projects represent anticipated developments or land use changes expected to occur by the corresponding analysis years. For the purpose of the evacuation analysis, cumulative projects located within the same evacuation area or in adjacent areas were included, or partially included, in the calculation of total evacuating vehicles. The inclusion of each cumulative project was determined based on its proximity to the study area and the specific evacuation routes available to it. If a cumulative project was situated such that it had access to evacuation routes outside the study area, only a proportional share of its evacuating vehicles was included in the analysis. This approach ensures that the evacuation vehicle totals accurately reflect the potential demand on the primary evacuation routes being analyzed, while avoiding overestimating vehicles that may utilize alternative routes.

The detailed calculation of evacuating vehicles for each study area is shown in **Table 2** and the detailed calculations are included in **Attachment A.**

[7] https://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_599.pdf (p.5)

Table 2 – Evacuating Vehicles

Scenario	Number of Evacuating Vehicles by Area								Total
	A	B	C	D	E	F	G	Project	
Scenario 1 - Existing (2024) Conditions	632	7,812	25	86	1,008	567	5,052	N/A	15,182
Scenario 2 - Background (2030) Conditions	1,156	8,124	26	89	1,048	588	5,256	N/A	16,287
Scenario 3 - Background (2030 – Phase 1 through Phase 3) With Project Conditions	1,156	8,124	26	89	1,048	588	5,256	2,584	18,871
Scenario 4 - Cumulative No Project Conditions (2045)	1,334	9,372	30	103	1,210	678	6,064	N/A	18,791
Scenario 5 - Cumulative With Project Conditions (2045 – Project Buildout)	1,334	9,372	30	103	1,210	678	6,064	3,822	22,613

Source: CR Associates (2025), US Census Bureau (2025), Google Maps (2025).

Extreme Wildfire Event

The evacuation analysis presented here assumes a southerly wind pattern, meaning wind blowing from south to north. Although this wind direction is relatively uncommon in Beaumont, it represents the scenario most likely to require a full evacuation of the Project site and adjacent areas, as it would drive fire toward the developed properties to the north. In reality, the prevailing wind patterns in Beaumont are predominantly westerly or northwesterly, as documented by WeatherSpark[8] and regional wind studies[9]. These winds are channeled through the San Gorgonio Pass for most of the year, making them the typical wind direction experienced in the area. Under a westerly wind scenario, a fire originating to the west would primarily threaten areas west of the Project site, such as Area E and Area G, and might not necessitate evacuation of areas to the east, such as Area A and Area B. Nonetheless, to ensure a conservative and comprehensive analysis, it is assumed that Areas A through G, as well as the Project site, would evacuate simultaneously under all scenarios.

In California, wildfire-related large-scale evacuations are almost exclusively associated with wildfires that occur on extreme fire weather days, also known as "Red Flag Warning" days. These days occur when relative humidity drops to low levels and strong winds from the north/northeast are sustained. With climate change, periods in which such wildfires occur may increase. During Red Flag Warning days, vegetation is more likely to ignite and fire spread is more difficult to control. In Riverside County, these extreme weather days typically occur during limited periods in the late summer, fall and, occasionally, in the spring, but may occur at other times on a less frequent basis. Currently, it is not common to experience more than 15 to 20 Red Flag Warning days in a typical year. Wildfires that occur during these periods of extreme weather are driven by winds –referred to as "Santa Ana" winds – that originate in the north or east and blow toward the south or west. Fires driven by these winds move very quickly, making them difficult to control. In response to such fires, emergency managers typically activate pre-planned evacuation triggers that require down-wind communities to sequentially be notified to evacuate and move to nearby urbanized areas prior to the fire's encroachment.

Wildfires that occur on non-extreme weather days behave in a much less aggressive manner and pose fewer dangers to life and property because they include less aggressive fire behavior and are easier to control. Terrain and fuel are typically the wildfire drivers. During these non-extreme weather days, vegetation is much more difficult to ignite and does not spread fire as rapidly. In these situations,

[8] https://weatherspark.com/y/2098/Average-Weather-in-Beaumont-California-United-States-Year-Round
[9] https://www.markgps.com/palm-springs-wind-map.html

firefighters have a very high success rate of controlling fires and keeping them under 10 acres. CALFIRE estimates that 90% of all vegetation fires occur during normal, onshore weather conditions and that such fires account for only 10% of the land area burned. Conversely, the 10% of wildfires that occur during extreme fire weather account for 90% of the land area burned. This data highlights that the most dangerous fire conditions are those related to a fire that moves rapidly due to high winds and low humidity, whereas under normal conditions fires are likely to be controlled with no evacuation or possibly limited, focused evacuations.

Primary Evacuation Routes

The analysis presented here selects a reasonable evacuation route for the extreme weather scenario and a fire traveling from south to north. In each scenario, the evacuation areas are expected to use local roads and SR-79 to reach I-10 and Downtown Beaumont. Detailed evacuation analysis information is provided in **Attachment B**.

No contraflow lanes were utilized to provide additional evacuation capacity under the analysis. Contraflow or lane reversal involves reversing the usual flow of one or more lanes to serve additional outbound evacuation traffic, increasing outbound traffic capacity to move people away from the wildfire or other hazards. Such a strategy can be used to eliminate bottlenecks in communities with road geometrics that prevent efficient evacuations or to otherwise hasten and facilitate traffic flow. However, among the considerations in planning emergency contraflow are whether sufficient traffic control officers are available, potential negative impact on responding fire apparatus, access management, merging, exiting, safety concerns, and labor requirements.[10] None of the evacuation scenarios analyzed here assumed contraflow traffic flow would be implemented; instead, two-way travel flow was utilized, with evacuating vehicles traveling outbound to the Safe Zone, and inbound lanes assumed to be reserved for use by first responders, law enforcement, and fire fighters. Based on recent practice, it is reasonably assumed that first responders or law enforcement will direct traffic at all major intersections during the evacuation process. Should evacuation managers determine that contraflow is preferred or necessary in the context of an actual wildfire event, contraflow remains a tool in the evacuation manager's toolbelt that would increase evacuation capacity and decrease evacuation times.

Analysis Methodology

To analyze evacuation events, CR Associates (CRA) utilized PTV Vissim, a widely recognized microscopic, multimodal traffic simulation software, to model and assess evacuation scenarios. Vissim has been widely used in evacuation and emergency planning research and real-world applications[11].

Vissim is capable of simulating detailed traffic operations by representing each individual vehicle and driver in the network, allowing for nuanced modeling of complex behaviors such as lane changing, acceleration, and gap acceptance, all of which are critical to realistic evacuation analysis. In these simulations, Vissim accounts for roadway capacity constraints and dynamically tracks every vehicle's movements at 0.1-second intervals, providing a high-resolution dataset for measures of effectiveness such as average vehicle speed, queue lengths, travel times, and congestion hotspots.

This modeling approach enables the simulation to capture the unique traffic dynamics that often emerge during mass evacuations, including increased driver stress, atypical routing decisions, and changes in flow rates. For this study, a total of 20 simulation runs were performed to generate a

[10] Dudek July 2014. "Wildland Fire Evacuation Procedures Analysis" for City of Santa Barbara, California, page 65.
[11] https://www.sciencedirect.com/science/article/abs/pii/S1569190X16302520, https://journals.sagepub.com/doi/10.3141/2312-13, https://rosap.ntl.bts.gov/view/dot/16885

robust statistical sample and ensure reliability in the results, allowing for assessment of both average conditions and the variability in outcomes during evacuation events.

Evacuation Analysis & Results

Based on the analysis methodology described above, **Table 3,** below**,** reflects the evacuation times for each scenario depicted on an area-by-area basis (Areas A through G), along with the Project's evacuation times and the Project's *effect* on evacuation times for Areas A through G. The evacuation time for each area is calculated based on the arrival of the last vehicle from that area at I-10/Downtown Beaumont.

The summaries for each study scenario, as presented in detail in Table 3, are as follows:

Table 3 – Evacuation Time Summary – All Scenarios

Scenario	# Vehicles	Evacuation Time (Hours: Minutes)							
		A	B	C	D	E	F	G	Project
Scenario 1 - Existing (2024) Conditions	15,182	0:29	2:23	0:49	0:48	1:08	0:54	1:35	N/A
Scenario 2 - Background (2030) Conditions	16,287	0:53	3:18	0:47	0:46	0:48	0:54	3:32	N/A
Scenario 3 - Background (2030 – Phase 1 through Phase 3) With Project Conditions	18,871	0:53	3:18	0:49	1:08	1:20	0:58	3:36	3:45
Δ Evacuation Time (Scenario 3 – Scenario 2)	**N/A**	**0:00**	**0:00**	**0:02**	**0:22**	**0:32**	**0:04**	**0:04**	**3:45**
Scenario 4 - Cumulative No Project Conditions (2045)	18,791	1:04	3:49	0:52	0:52	0:54	1:01	4:07	N/A
Scenario 5 - Cumulative With Project Conditions (2045 – Project Buildout)	22,613	1:04	3:52	0:53	1:23	1:37	1:08	4:11	4:33
Δ Evacuation Time (Scenario 5 – Scenario 4)	**N/A**	**0:00**	**0:03**	**0:01**	**0:31**	**0:43**	**0:07**	**0:04**	**4:33**

Source: CR Associates (2025).

Scenario 1 - Existing (2024) Conditions

Scenario 1 represents existing (2024) conditions, with an estimated 15,182 vehicles requiring evacuation. Under these conditions, evacuation times for each area are as follows: Area A evacuates in 29 minutes, Area B in 2 hours and 23 minutes, Area C in 49 minutes, Area D in 48 minutes, Area E in 1 hour and 8 minutes, Area F in 54 minutes, Area G in 1 hour and 35 minutes, and there is no Project component in this scenario.

Scenario 2 - Background (2030) Conditions

Scenario 2 reflects background (2030) conditions, accounting for anticipated growth and an increase in evacuating vehicles to 16,287. As a result, evacuation times increase in some areas: Area A takes 53 minutes, Area B takes 3 hours and 18 minutes, Area C takes 47 minutes, Area D takes 46 minutes, Area E takes 48 minutes, Area F takes 54 minutes, Area G takes 3 hours and 32 minutes, and the Project area is not yet included in this scenario.

Scenario 3 - Background (2030 – Phase 1 through Phase 3) With Project Conditions

Scenario 3 introduces the proposed Project, evaluating background (2030) conditions with Phases 1 through 3, resulting in 18,871 vehicles requiring evacuation. In this scenario, evacuation times are 53 minutes for Area A, 3 hours and 18 minutes for Area B, 49 minutes for Area C, 1 hour and 8 minutes

for Area D, 1 hour and 20 minutes for Area E, 58 minutes for Area F, 3 hours and 36 minutes for Area G, and 3 hours and 45 minutes for the Project area. Compared to Scenario 2, the addition of the Project results in incremental increases in evacuation times, most notably 22 minutes longer for Area D, 32 minutes for Area E, 4 minutes for Areas F and G, and 3 hours and 45 minutes added for the Project itself.

Scenario 4 - Cumulative No Project Conditions (2045)

Scenario 4 evaluates cumulative (2045) conditions without the Project, with a total of 18,791 vehicles. Under this scenario, evacuation times are 1 hour and 4 minutes for Area A, 3 hours and 49 minutes for Area B, 52 minutes for Area C, 52 minutes for Area D, 54 minutes for Area E, 1 hour and 1 minute for Area F, and 4 hours and 7 minutes for Area G. The Project area is not included in this scenario.

Scenario 5 - Cumulative With Project Conditions (2045 – Project Buildout)

Scenario 5 examines cumulative (2045) conditions with full Project buildout, resulting in 22,613 vehicles requiring evacuation. Evacuation times increase to 1 hour and 4 minutes for Area A, 3 hours and 52 minutes for Area B, 53 minutes for Area C, 1 hour and 23 minutes for Area D, 1 hour and 37 minutes for Area E, 1 hour and 8 minutes for Area F, 4 hours and 11 minutes for Area G, and 4 hours and 33 minutes for the Project area. Compared to Scenario 4, the addition of the Project results in evacuation time increases of 3 minutes for Area B, 1 minute for Area C, 31 minutes for Area D, 43 minutes for Area E, 7 minutes for Area F, and 4 minutes for Area G, with a total evacuation time of 4 hours and 33 minutes for the Project area.

Analysis and Conclusion

Neither CEQA, nor the County has adopted numerical time standards for determining whether an evacuation timeframe is appropriate. Public safety, not time, is generally the guiding consideration for evaluating impacts related to emergency evacuation. The City considers a project's impact on evacuation significant if the project will significantly impair or physically interfere with implementation of an adopted emergency response or evacuation plan; or if the project will expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

In any populated area, safely undertaking large-scale evacuations may take several hours or more and require moving people long distances to designated areas. Further, evacuations are fluid and timeframes may vary widely depending on numerous factors, including, among other things, the number of vehicles evacuating, the road capacity to accommodate those vehicles, evacuees' awareness and preparedness, evacuation messaging and direction, and on-site law enforcement control. The "Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act"[12] guidance from the California Office of the Attorney General suggests that jurisdictions set benchmarks of significance based on past successful evacuations or on those from communities in similar situations.

A recent study titled "Review of California Wildfire Evacuation from 2017 to 2019[13]" provides more insights on the topic. This research involved interviews with 553 individuals (297 evacuees affected by various fires) including the Creek Fire, Rye Fire, Skirball Fire, and Thomas Fire. The study aimed to understand the decision-making processes of these individuals during the fires, such as whether to evacuate or stay, when to leave, the paths taken, chosen shelters, destinations, and modes of transportation. According to this research, the time it took for evacuations ranged from under 30 minutes to over 10 hours. From this dataset[14], the average evacuation time for the Creek Fire was

[12] https://oag.ca.gov/system/files/attachments/press-docs/2022.10.10%20-%20Wildfire%20Guidance.pdf
[13] https://escholarship.org/uc/item/5w85z07g
[14] 2018 Carr Wildfire Evacuation Survey Data | Zenodo

found to be 3 hours and 40 minutes, involving 115,000 people[15]. For the Thomas Fire, the average time was 4 hours and 25 minutes, impacting 104,607 individuals.

California fire and law enforcement agencies have integrated training, experience, and technology to assist in successful evacuations, which focus on moving persons at risk to safer areas before a wildfire encroaches on a populated area. Timeframes for moving people vary by site specifics, population, road capacities and other factors and there is no one threshold that would be appropriate to all locations. There are no established thresholds for evacuation times for this Project or at the time of this plan's preparation, for any California community, to the knowledge of the authors. This is primarily because every location and fire scenario are unique. While it may take one community 20 minutes to evacuate safely, it is not a valid assumption to consider a 3-hour evacuation for another community as unsafe. The 3-hour evacuation can be very safe while the 20-minute evacuation may be unsafe due to the conditions and exposures along the evacuation routes.

The City of Beaumont and County of Riverside (City/County) has historically had an extremely high success rate for safely evacuating large numbers of people and doing so in a managed and strategic way using available technological innovations. Safely undertaking large-scale evacuations may take several hours or more and require moving people long distances to designated areas. Further, evacuations are fluid and timeframes may vary widely depending on numerous factors, including, among other things, the number of vehicles evacuating, the road capacity to accommodate those vehicles, evacuees' awareness and preparedness, evacuation messaging and direction, and on-site law enforcement control.

Notwithstanding inherent evacuation challenges and uncertainties, the City/County demonstrates a very high effectiveness in managing both mass and targeted evacuations. This assessment is supported by documented evacuation outcomes showing consistently safe and orderly evacuations and is further reinforced by established emergency management protocols, including EFS-16[16]. Technological advancements and improved evacuation strategies learned from prior wildfire evacuation events have resulted in a system that is many times more capable of managing evacuations. With the technology in use today in the County, evacuations are more strategic and surgical than in the past, evacuating smaller areas at highest risk and phasing evacuation traffic so that it flows more evenly and minimizes the surges that may slow an evacuation. Mass evacuation scenarios where large populations are all directed to leave simultaneously, resulting in traffic delays, are thereby avoided, and those populations most at risk populations are able to safely evacuate.

Project would also provide emergency managers the alternative option of recommending the Project's employee/visitors to temporarily seek refuge on-site in fire-resistant buildings[17], temporary refuge areas, or within the wide, converted landscapes and hardscapes that would not readily facilitate wildfire spread. This would provide emergency managers with a safer alternative to risking a late evacuation. By contrast, the examples of Southern California evacuations that have included loss of life have been the result of evacuees who did not evacuate when directed, and then attempted a late evacuation with travel through long distances of exposed travel ways as wildfire was overtaking the

[15] https://abc7.com/sylmar-brush-fire-creek-kagel-canyon/2740550/

[16] Both the Wolf Fire After Action Report (AAR) (https://www.rvcfire.org/incidents/fact-sheets/Wolf_June2025) and the Rosa Fire AAR (https://www.rvcfire.org/incidents/fact-sheets/Rosa-08-2025) indicate that there were zero fatalities associated with these incidents. These fires represent the most recent wildfires in the 2025 calendar year for which AARs are currently available in Riverside County. In addition, a review of CAL FIRE incident statistics and available news coverage does not identify any wildfire-related fatalities in Riverside County for 2025, including across the 58 wildfires that occurred within the County during that year.

[17] The Project buildings are anticipated to be designed as ignition-resistant in accordance with Chapter 5 of the California Wildland–Urban Interface Code (CWUIC) and are expected to utilize concrete tilt-up construction. Concrete construction is inherently noncombustible and typically provides up to a four-hour fire-resistance rating, which generally affords greater fire resistance than Type V residential construction, which is not rated.

area. These examples occurred in fire environments that were more aggressive and included less maintenance than would occur at the Project area.[18]

The information presented here will be provided to emergency managers for use in pre-planning scenarios to better inform the field decisions made pursuant to adopted Emergency Operations Plans. Emergency personnel who issue an evacuation order may take into account these time estimates in determining when and where to issue evacuation orders. In a real evacuation scenario, emergency managers may use alternative actions/options to further expedite evacuation. Such actions may include providing additional lead time in issuing evacuation orders, providing alternative signal control at downstream intersections, utilizing additional off-site routes or directing traffic to roadways with additional capacity, implementing contra-flow lanes, or considering the possibility of a delayed evacuation where parts of the population could be directed to remain on-site until the fire burns out in the sparse fuels around the evacuation route. These options require "in the field" determinations of when evacuations are needed and how they are phased to maximize efficiency. Overall, safe evacuation of Project and the surrounding community is possible under all modeled scenarios.

Limitations

In coordination with fire professionals at Dudek, CRA has presented here a conservative analysis simulating evacuation during an extreme wildfire event. As previously noted, the analysis presents the total time to complete evacuation of all evacuees under the various scenarios, and not the average travel time for a single evacuee.

However, as discussed above, wildfires are variable events. The underlying planning principle for fire preparedness, given the dynamic nature of a fire, is to demonstrate the availability of multiple route alternatives and response strategies to permit emergency professionals to manage their response according to the specific circumstances. The Project area provides route and response alternatives too numerous to be considered in this model. Emergency responders will coordinate the safest possible evacuation based on the dynamic circumstances of the actual event, including the appropriate phasing of the evacuation, and utilization of the most appropriate ingress and egress routes for area evacuees and emergency responders.

The scope of route alternatives and response strategies available to emergency professionals to manage a potential fire in the City/County cannot be and should not be evaluated using this evacuation analysis alone. However, a more comprehensive view of Project's fire safety is gained by understanding this memorandum, the Fire Protection Plan, the Wildland Fire Evacuation Program, and the standard protocols and "in-the-field" decision making of emergency responders as detailed in the City/County Emergency Operations Plan.

The travel time analysis presented here calculated a reasonable vehicle travel time estimate based on professional judgment made by CRA, Dudek, and fire operations experts with experience participating in evacuations in Southern California.

The net result of changing the variables selected could yield an average evacuation travel time shorter or longer than the results detailed in the analysis. Many factors can shorten or lengthen the vehicle time from the results shown herein. For example:

[18] San Diego County Sheriff's Department, Captain Dave Brown during public testimony for the Harmony Grove Village South, Newland Sierra, Otay Ranch Villages 13 and 14 projects – various dates from 2017 to 2019.

1. Changing the possible evacuation routes selected would affect the results. For instance, utilizing roads for ingress and/or egress that are not utilized in this analysis could shorten or lengthen vehicle travel times relative to the results shown herein.

2. Increasing or decreasing the number of path permutations and percentage of the population utilizing each route that leads out of the immediate area could shorten or lengthen vehicle travel time relative to the results shown herein.

3. Emergency professionals electing to reserve certain travel lanes for emergency vehicle ingress for periods of time could affect the travel time relative to the results shown herein.

4. Assuming evacuees utilize fewer or more vehicles to evacuate from their homes relative to the vehicle utilization rate selected in the analysis would shorten or lengthen vehicle travel time relative to the results shown herein.

5. Changing the mix of vehicle trips allocated to each evacuation route could shorten or lengthen vehicle travel time relative to the results shown herein.

6. Assuming different road condition adjustment factors could shorten or lengthen the vehicle travel time relative to the results shown herein.

7. Assuming fewer people are at home or at work when the evacuation notice is given would reduce the number of vehicle trips and shorten vehicle travel time relative to the results shown herein. For instance, an evacuation during daytime hours could result in fewer outbound trips from the surrounding residential neighborhoods than assumed in this analysis

8. Assuming some portion of vehicle trips are made in advance of the evacuation notice would reduce the number of vehicle trips relative to the results shown herein.

9. Assuming emergency professionals elect to implement contraflow on certain roadways to open up additional lanes for emergency evacuation egress could reduce the travel time results shown herein.

10. The availability of new information, unexpected weather conditions, and other unforeseen factors such as changes in fuel loads or shifting weather patterns may influence fire behavior and evacuation outcomes in ways not anticipated at the time of this analysis.

The analysis and conclusions presented in this technical memorandum represent the best professional judgment of the author based on the current state of evacuation and fire science at the time of this report. It is important to note that as climate change progresses, new wildfire events occur, firefighting technologies advance, and after-action reports are produced, the understanding of wildfire behavior and best evacuation practices will continue to evolve. Therefore, practitioners should always consult the most current guidelines, scientific literature, and agency recommendations when planning for wildfire evacuations. The findings and recommendations in this report are intended to provide a snapshot in time and should not be considered a static or exhaustive source. Continued diligence and adaptation to emerging knowledge and practices are strongly recommended.

This evacuation time analysis is necessarily limited in scope given the numerous variables inherent in a wildfire and evacuation event. However, as discussed above, it is not anticipated that Project will significantly impact the time it takes to conduct an evacuation of the Project site or existing surrounding communities based on the evacuation times calculated here and other qualitative considerations.

Prepared by

Phuong Nguyen, PE
Senior Transportation Engineer
CR Associates

Attachment A
Evacuating Vehicles Calculation and Other Supporting Information

Vehicle Ownership obtained from
https://www.beaumontca.gov/DocumentCenter/View/37216/Community-Demographic-Profile

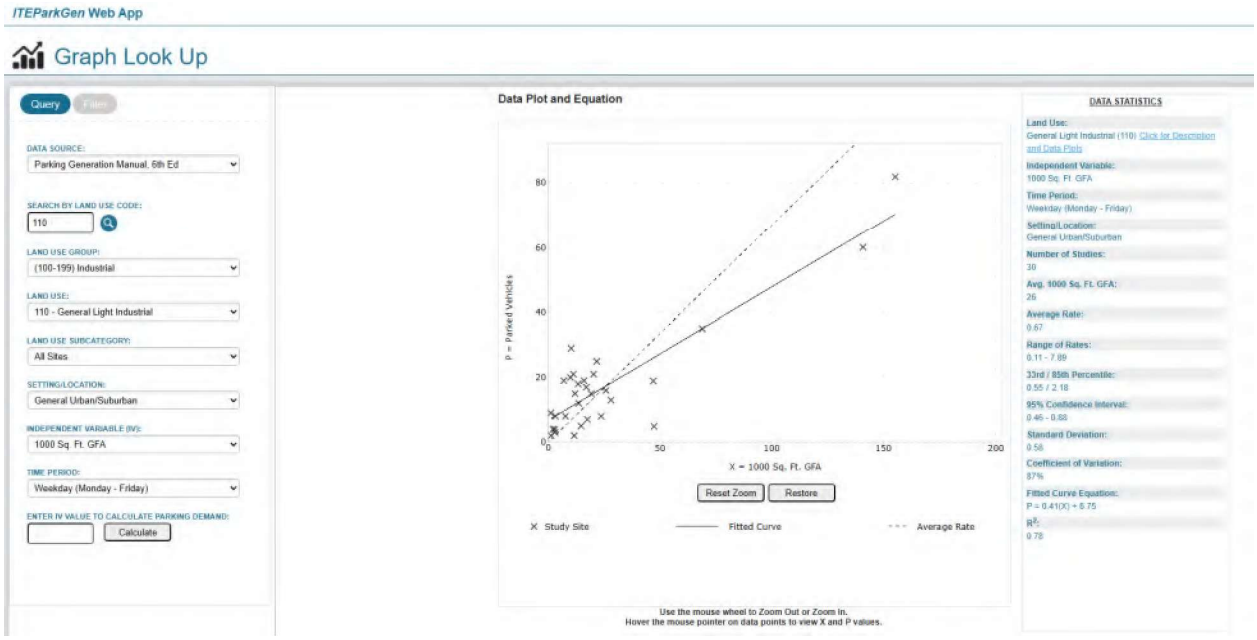
Community • Demographic Profile

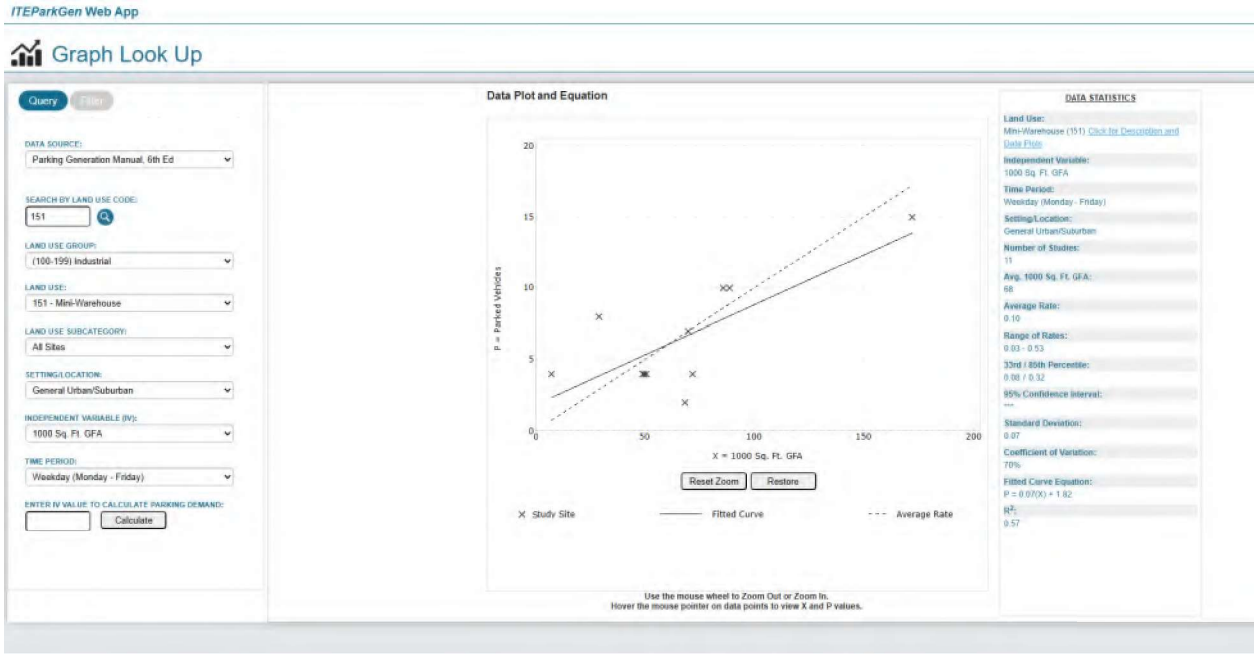
Beaumont, California

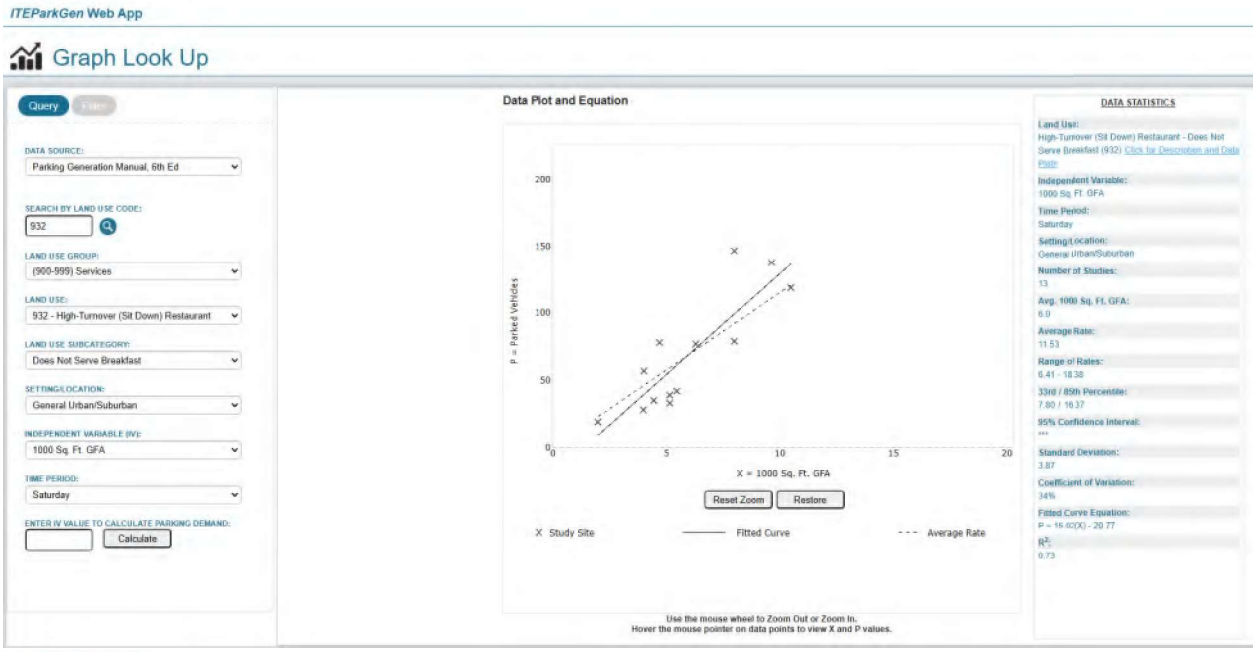
DESCRIPTION	DATA	%
2021 Est. Households by Presence of People Under 18	**15,605**	
Households with 1 or More People under Age 18:	6,565	42.07%
Married-Couple Family	4,711	71.76%
Other Family, Male Householder	613	9.34%
Other Family, Female Householder	1,190	18.13%
Nonfamily, Male Householder	35	0.53%
Nonfamily, Female Householder	16	0.24%
Households with No People under Age 18:	**9,040**	**57.93%**
Married-Couple Family	4,718	52.19%
Other Family, Male Householder	264	2.92%
Other Family, Female Householder	589	6.52%
Nonfamily, Male Householder	1,526	16.88%
Nonfamily, Female Householder	1,943	21.49%
2021 Est. Households by Number of Vehicles	**15,605**	
No Vehicles	304	1.95%
1 Vehicle	3,860	24.74%
2 Vehicles	6,431	41.21%
3 Vehicles	3,271	20.96%
4 Vehicles	1,087	6.97%
5 or more Vehicles	652	4.18%
2021 Est. Average Number of Vehicles		2.2
Family Households		
2026 Projection	12,814	
2021 Estimate	12,082	
2010 Census	9,328	
2000 Census	3,349	
Growth 2021 - 2026		6.06%
Growth 2010 - 2021		29.52%
Growth 2000 - 2010		178.53%
2021 Est. Families by Poverty Status	**12,082**	
2021 Families at or Above Poverty	11,276	93.33%
2021 Families at or Above Poverty with Children	5,559	46.01%
2021 Families Below Poverty	806	6.67%
2021 Families Below Poverty with Children	483	4.00%
2021 Est. Pop 16+ by Employment Status	**39,498**	
Civilian Labor Force, Employed	22,344	56.57%
Civilian Labor Force, Unemployed	1,122	2.84%
Armed Forces	47	0.12%
Not in Labor Force	15,985	40.47%

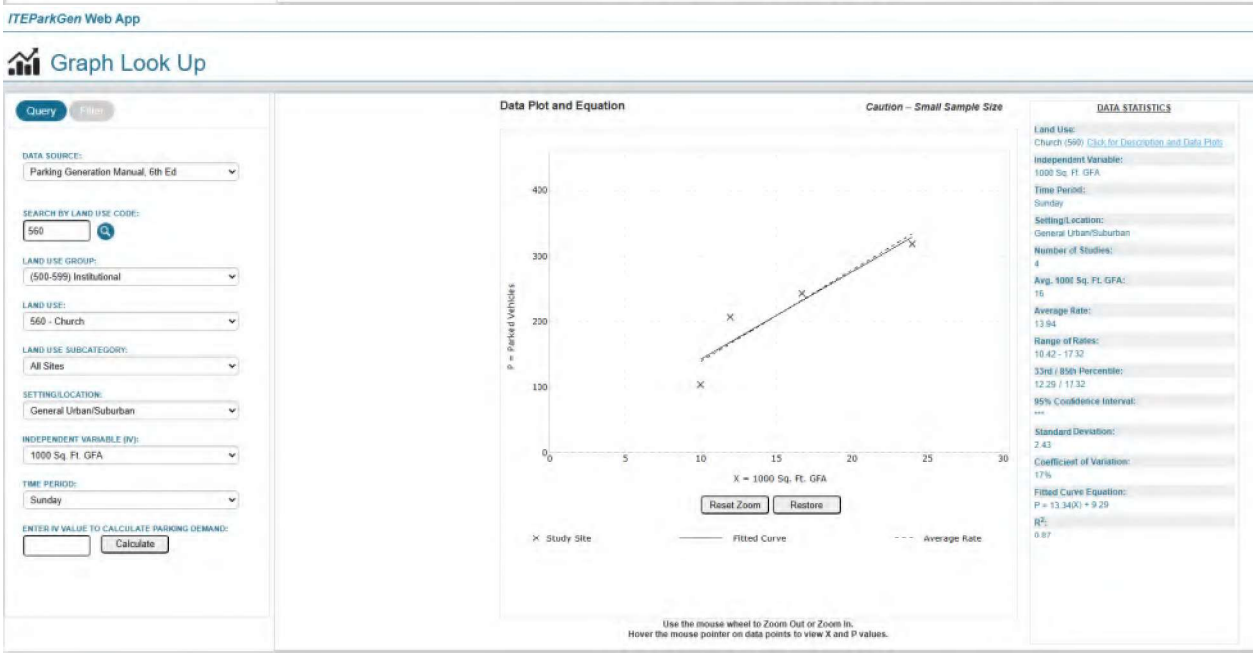
DESCRIPTION	DATA	%
2021 Est. Civ. Employed Pop 16+ by Class of Worker	**22,344**	
For-Profit Private Workers	15,044	67.33%
Non-Profit Private Workers	1,294	5.79%
Local Government Workers	445	1.99%
State Government Workers	1,014	4.54%
Federal Government Workers	2,847	12.74%
Self-Employed Workers	1,674	7.49%
Unpaid Family Workers	29	0.13%
2021 Est. Civ. Employed Pop 16+ by Occupation	**22,344**	
Architect/Engineer	203	0.91%
Arts/Entertainment/Sports	147	0.66%
Building Grounds Maintenance	543	2.43%
Business/Financial Operations	679	3.04%
Community/Social Services	369	1.65%
Computer/Mathematical	407	1.82%
Construction/Extraction	1258	5.63%
Education/Training/Library	1580	7.07%
Farming/Fishing/Forestry	80	0.36%
Food Prep/Serving	1296	5.80%
Health Practitioner/Technician	2109	9.44%
Healthcare Support	990	4.43%
Maintenance Repair	809	3.62%
Legal	188	0.84%
Life/Physical/Social Science	145	0.65%
Management	1665	7.45%
Office/Admin. Support	2914	13.04%
Production	1090	4.88%
Protective Services	753	3.37%
Sales/Related	2232	9.99%
Personal Care/Service	809	3.62%
Transportation/Moving	2078	9.30%
2021 Est. Pop 16+ by Occupation Classification	**22,344**	
White Collar	12,640	56.57%
Blue Collar	5,233	23.42%
Service and Farm	4,471	20.01%
2021 Est. Workers Age 16+ by Transp. to Work	**22,344**	
Drove Alone	18,172	81.33%
Car Pooled	2,397	10.73%
Public Transportation	210	0.94%
Walked	235	1.05%
Bicycle	16	0.07%
Other Means	302	1.35%
Worked at Home	1,012	4.53%

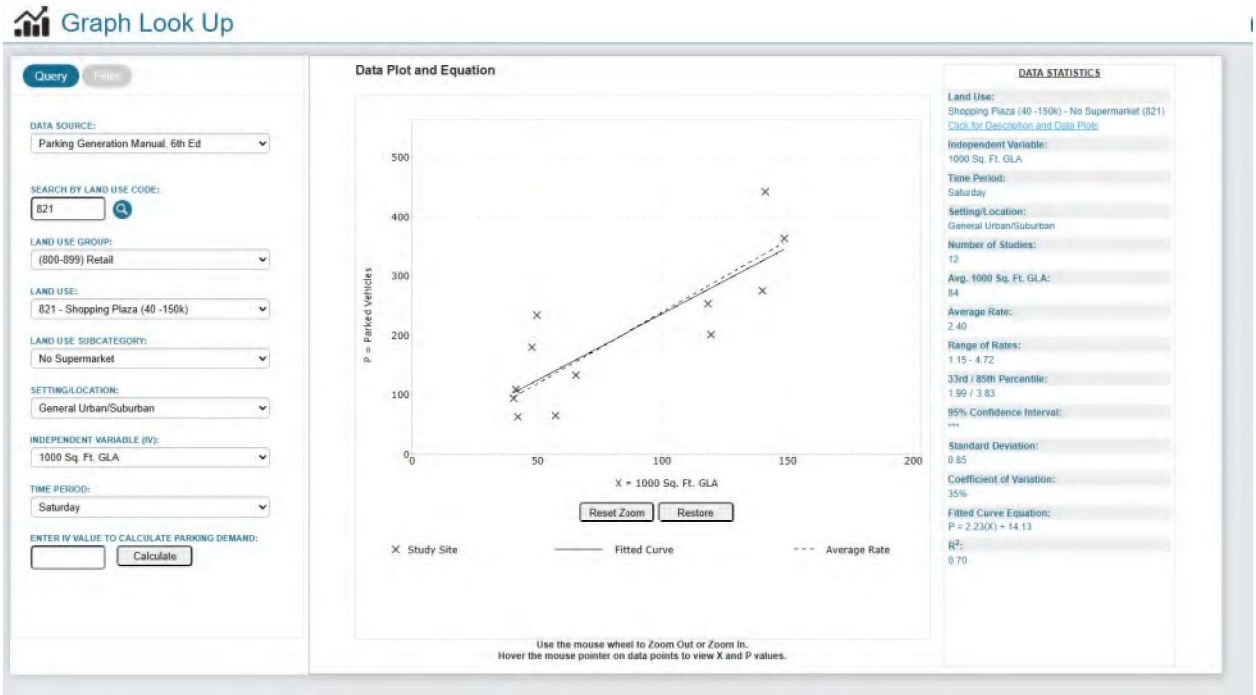
ITE Parking Rate






ITEParkGen Web App
Graph Look Up
Query
Filter
DATA SOURCE:
Parking Generation Manual, 6th Ed
SEARCH BY LAND USE CODE:
932
LAND USE GROUP:
(900-999) Services
LAND USE:
932 - High-Turnover (Sit Down) Restaurant
LAND USE SUBCATEGORY:
Does Not Serve Breakfast
SETTING/LOCATION:
General Urban/Suburban
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA
TIME PERIOD:
Saturday
ENTER IV VALUE TO CALCULATE PARKING DEMAND:
Calculate
Data Plot and Equation
P = Parked Vehicles
X = 1000 Sq. Ft. GFA
Reset Zoom
Restore
X Study Site
Fitted Curve
Average Rate
Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and P values.
DATA STATISTICS
Land Use:
High-Turnover (Sit Down) Restaurant - Does Not Serve Breakfast (932) Click for Description and Data Plots
Independent Variable:
1000 Sq. Ft. GFA
Time Period:
Saturday
Setting/Location:
General Urban/Suburban
Number of Studies:
13
Avg. 1000 Sq. Ft. GFA:
6.0
Average Rate:
11.53
Range of Rates:
6.41 - 18.38
33rd / 85th Percentile:
7.80 / 16.37
95% Confidence Interval:
Standard Deviation:
3.87
Coefficient of Variation:
34%
Fitted Curve Equation:
P = 16.60(X) + 20.77
R²:
0.73


ITEParkGen Web App
Graph Look Up
Query
Filter
DATA SOURCE:
Parking Generation Manual, 6th Ed
SEARCH BY LAND USE CODE:
560
LAND USE GROUP:
(500-599) Institutional
LAND USE:
560 - Church
LAND USE SUBCATEGORY:
All Sites
SETTING/LOCATION:
General Urban/Suburban
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA
TIME PERIOD:
Sunday
ENTER IV VALUE TO CALCULATE PARKING DEMAND:
Calculate
Data Plot and Equation
Caution – Small Sample Size
P = Parked Vehicles
X = 1000 Sq. Ft. GFA
Reset Zoom
Restore
X Study Site
Fitted Curve
Average Rate
Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and P values.
DATA STATISTICS
Land Use:
Church (560) Click for Description and Data Plots
Independent Variable:
1000 Sq. Ft. GFA
Time Period:
Sunday
Setting/Location:
General Urban/Suburban
Number of Studies:
4
Avg. 1000 Sq. Ft. GFA:
16
Average Rate:
13.94
Range of Rates:
10.42 - 17.32
33rd / 85th Percentile:
12.29 / 17.32
95% Confidence Interval:
Standard Deviation:
2.43
Coefficient of Variation:
17%
Fitted Curve Equation:
P = 13.34(X) + 9.29
R²:
0.87



Genasysi Evac Zones vs. Evacuation Zones

	Evacuation Zone							
Genasys Zone	A	B	C	D	E	F	G	Project
	BMT-0516	BMT-0514	RVC-0643	RVC-0643	RVC-0642	BMT-0511	BMT-0509	RVC-0643
	BMT-0517	BMT-0515		BMT-0827	BMT-0511		RVC-0642	
		BMT-0517					BMT-0511	
		BMT-0520						
		BMT-0645						
		RVC-0643						
		BMT-0646						
		BMT-0644						

Evacuating Vehicles Calculation by Zone by Scenario

Scenario	Area	Land Use	Amount	Rate	Rate Source	Total Vehicles	Traffic Study Passenger ADT	Traffic Study Truck ADT	Total	Total Parked Passenger Vehicle	Total Parked Truck Vehicle	Percent Passenger	Percent Truck	Passenger Car Input	Truck Input
Existing	A	Residential	17	2.2	City of Beaumont	38						98%	2%	37	1
Existing	A	Light-Industrial (1,000 square feet)	419	0.67	ITE Parking Generation	281						94%	6%	264	17
Existing	A	Self Storage (1,000 square feet)	113	0.1	ITE Parking Generation	12						98%	2%	12	0
Existing	A	Restaurant (1,000 square feet)	26	11.53	ITE Parking Generation	300						98%	2%	294	6
Existing	B	Residential	2938	2.2	City of Beaumont	6464						98%	2%	6335	129
Existing	C	Residential	11	2.2	City of Beaumont	25						98%	2%	25	0
Existing	D	Residential	39	2.2	City of Beaumont	86						98%	2%	84	2
Existing	E	Residential	49	2.2	City of Beaumont	108						98%	2%	106	2
Existing	F	Residential	93	2.2	City of Beaumont	205						98%	2%	201	4
Existing	F	Light-Industrial (1,000 square feet)	378	0.67	ITE Parking Generation	254						94%	6%	239	15
Existing	F	Self Storage (1,000 square feet)	247	0.1	ITE Parking Generation	25						98%	2%	25	0
Existing	F	Church	5	13.94	ITE Parking Generation	70						98%	2%	69	1
Existing	G	Egg Farm (1,000 square feet)	264	0.67	Use Light Industrial Rate - observation show much less	177						94%	6%	166	11
Existing	G	Residential	28	2.2	City of Beaumont	62						98%	2%	61	1
Existing	G	Light-Industrial (1,000 square feet)	3291	0.67	ITE Parking Generation	2205						94%	6%	2073	132
Project	Project	Light-Industrial (1,000 square feet)	688.2	0.67	ITE Parking Generation	462	2696	148	2844	438	2258	95%	5%	438	24
Project	Project	Light-Industrial (1,000 square feet)	1488.6	0.67	ITE Parking Generation	998	8524	462	8986	947	7577	95%	5%	947	51
Project	Project	Light-Industrial (1,000 square feet)	1675.6	0.67	ITE Parking Generation	1123	15084	812	15896	1066	14018	95%	5%	1066	57
Project	Project2	Light-Industrial (1,000 square feet)	1847.6	0.67	ITE Parking Generation	1238	22318	1198	23516	1175	21143	95%	5%	1175	63
Cumulative	A	79 North Logistics (1,000 squarefeet light industrial)	404.2	0.67	ITE Parking Generation	271						94%	6%	255	16
Cumulative	A	Pacific Scene (95 SF Residential)	95	2.2	City of Beaumont	209						98%	2%	205	4
Cumulative	B	Potrero Creek Estates (700 SF Residential	700	2.2	City of Beaumont	1540						98%	2%	1509	31
Cumulative	F	McClure Machine Shop (16,800 squarefeet light industrial	16.82	0.67	ITE Parking Generation	12						94%	6%	11	1
Cumulative	G	Legacy Highland (High Cube Warehouse & Cold Storage) - 20406000 SF total, 20% may shared same route as project	20406	0.39	ITE Parking Generation	1592						94%	6%	1496	96
Cumulative	G	Legacy Highland (Commercial) 143000 SF total, , 20% may shared same route as project	143	2.4		69						98%	2%	68	1
Cumulative	G	Taurek (Single Family Residential)	244	2.2	City of Beaumont	537						98%	2%	526	11
Cumulative	G	Orchard Logistic (High Cube Fulfillment)	610	0.67	ITE Parking Generation	409						94%	6%	384	25

Attachment B
Evacuation Analysis Worksheets

Per the Highway Capacity manual:
"The base capacity values presented in the HCM—for example, 2,400 vehicles per hour per lane on a freeway with a 75-mph free-flow speed, or 1,900 vehicles per hour of green at a traffic signal—are just that: *base values.* These values incorporate, among other factors, ideal roadway geometry, a traffic stream composed entirely of passenger cars, and good weather.

Highway Capacity Manual: A Guide for Multimodal Mobility Analysis

Exhibit 12-4
Basic Freeway and Multilane Highway Segment Capacity Under Base Conditions

FFS (mi/h)	Capacity of Basic Freeway Segments (pc/h/ln)	Capacity of Multilane Highway Segments (pc/h/ln)
75	2,400	NA
70	2,400	2,300[a]
65	2,350	2,300[a]
60	2,300	2,200
55	2,250	2,100
50	NA	2,000
45	NA	1,900

Notes: NA = not available.
[a] Capacities for multilane highways with 65- and 70-mi/h FFS are extrapolated and not based on field data.

The table below presents roadway capacity in five-minute increments, reflecting its significant variations within an hour.

Speed	Capacity per Hour	Capacity per 5 Minutes	Source
25	1500	125	Estimate based on HCM
30	1600	134	Estimate based on HCM
35	1700	142	Estimate based on HCM
40	1800	150	Estimate based on HCM
45	1900	159	HCM Multi-lane Highway
50	2000	167	HCM Multi-lane Highway
55	2100	175	HCM Multi-lane Highway
60	2200	184	HCM Multi-lane Highway
65	2300	192	HCM Multi-lane Highway

The evacuation capacity of each roadway varies due to factors such as speed limits and downstream traffic congestion. As a result, during evacuations, the number of vehicles that can travel per hour per lane is typically lower than during stable flow conditions.

The table below illustrates the number of vehicles passing through various roadway segments in five-minute intervals, as recorded over a two-hour period using the Vissim microsimulation model. The data indicate that the highest observed flows were below the theoretical (HCM) stable flow.

Existing (2024) Conditions

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	5366.235	1766.235	0:29
B		3600	B	59	12236.19	8636.185	2:23
C		3600	C	61	6543.345	2943.345	0:49
D		3600	D	62	6530.885	2930.885	0:48
E		3600	E	63	7737.515	4137.515	1:08
F		3600	F	64	6876.87	3276.87	0:54
G		3600	G	65	9319.23	5719.23	1:35

Background (2030) Conditions

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	6794.765	3194.765	0:53
B		3600	B	59	15520.1	11920.1	3:18
C		3600	C	61	6446.685	2846.685	0:47
D		3600	D	62	6387.63	2787.63	0:46
E		3600	E	63	6497.035	2897.035	0:48
F		3600	F	64	6840.825	3240.825	0:54
G		3600	G	65	16351.63	12751.63	3:32

Background (2030 – Phase 1 through Phase 3) With Project Conditions

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	6804.245	3204.245	0:53
B		3600	B	59	15530.23	11930.23	3:18
C		3600	C	61	6564.14	2964.14	0:49
D		3600	D	62	7714.245	4114.245	1:08
E		3600	E	63	8403.3	4803.3	1:20
F		3600	F	64	7105.41	3505.41	0:58
G		3600	G	65	16568.37	12968.37	3:36
Project		3600	Project	66	17134.53	13534.53	3:45

Cumulative No Project Conditions (2045)

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	7478.715	3878.715	1:04
B		3600	B	59	17356.69	13756.69	3:49
C		3600	C	61	6721.965	3121.965	0:52
D		3600	D	62	6725.315	3125.315	0:52
E		3600	E	63	6892.31	3292.31	0:54
F		3600	F	64	7260.39	3660.39	1:01
G		3600	G	65	18434.53	14834.53	4:07

Cumulative With Project Conditions (2045 – Project Buildout)

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	7464.863	3864.863	1:04
B		3600	B	59	17537.49	13937.49	3:52
C		3600	C	61	6792.437	3192.437	0:53
D		3600	D	62	8582.905	4982.905	1:23
E		3600	E	63	9419.611	5819.611	1:37
F		3600	F	64	7707.205	4107.205	1:08
G		3600	G	65	18677.52	15077.52	4:11
Project		3600	Project	66	19990.74	16390.74	4:33

Reference & Analysis Tool Selection

The methodology for fire evacuation analysis is rapidly advancing as new data and best practices become available. Before conducting the evacuation analysis, a thorough historical review of fire evacuation behavior and practices was undertaken to ensure the analysis accurately reflects local conditions. Consequently, the list of references in the technical memorandum only includes documents that pertain directly to local operating conditions and behaviors. The intention behind this selective referencing is to guide decision-makers towards specific, location-relevant guidelines rather than providing a comprehensive list of all reviewed best practices.

CRA has compiled an extensive list of research and findings on best practices for both wildfire and standard evacuation analyses. These foundational best practices informed our evacuation analysis, and a selection of the most relevant and recent research is included at the end this section. According to the research, wildfire evacuation analysis is not a one-size-fits-all approach; certain tools and practices are better suited for jurisdiction-wide analysis, including transportation modeling, roadway capacity-based analysis, GIS analysis, and custom tools. Notably, "A Review of Traffic Models for Wildland-Urban Interface Wildfire Evacuation" (Bergstedt, 2017) identified 12 tools for evacuation analysis, a number that continues to grow as more data and computing power become available.

Vissim, although not the sole tool available for fire evacuation analysis, was chosen for its capability to simulate driver behaviors, particularly undesirable behaviors such as competing for the right-of-way during evacuations. This capability is endorsed by the Bergstedt research paper and is utilized by various agencies, including the Utah Department of Transportation and the Florida Department of Transportation for hurricane evacuation analysis. Vissim's popularity and widespread use in evacuation analysis are evidenced by its citation in over 700 research papers, reflecting its effectiveness in mirroring human behavior. Despite the availability of other tools, Vissim was deemed the most suitable for this project's evacuation analysis.

The WUI-NITY, while an impressive tool designed for evaluating jurisdiction-wide evacuation, does not fully meet the specific needs of this project. A critical aspect of our analysis is to manage varying traffic flows and dynamic roadway capacities that change due to downstream congestion. The WUI-NITY, which focuses on larger planning areas, relies on a simplified ad hoc traffic movement model that uses common assumptions in evacuation modeling and determines road capacity based on the number of lanes and road type. While this approach is generally acceptable, our study requires a more nuanced method that accounts for local conditions, such as winding roads where actual driving speeds may be lower than posted limits. Therefore, we opted to use Vissim for its finer detail in simulation.

Similarly, the Wildfire Safe Egress – Platform (WISE), developed by the UCLA Engineering Department, employs an approach akin to that of WUI-NITY. However, WISE, being a GIS-based analysis tool, considers varying evacuation patterns and uses GIS analysis to estimate actual evacuation times. Like WUI-NITY, the WISE platform is better suited for broader planning level analysis and does not offer the detailed benefits provided by the Vissim microsimulation platform.

Additionally, the "Traffic Modeling for Wildland–Urban Interface Fire Evacuation" research paper, which evaluated a broad range of potential fire evacuation modeling platforms including microsimulation, supports the methodology used in this project. The paper underscores that microsimulation should be sensitive to local conditions and reflect actual demand. This aligns with our approach: vehicle ownership was derived from census data to mirror local demand accurately, and speed and traffic counts were meticulously gathered from all study area roadways to calibrate the model. The research findings affirm the conclusions of the CRA team regarding the adoption of best practices in evacuation modeling.

Minimum Throughput Time (MTT) and the Role of Microsimulation in Evacuation Analysis

Appendix Q of the 2025 California Fire Code introduces Minimum Throughput Time (MTT) as part of the Community Wildland–Urban Interface (WUI) Fire Hazard Evaluation Framework. MTT is a screening-level, traffic-engineering calculation intended to provide an initial, lower-bound estimate of how long it would take for an assumed number of evacuation vehicles to pass through the most constrained elements of a community's evacuation network. It is based on simplified assumptions regarding roadway capacity, number of evacuation lanes, and nominal travel speeds, and is explicitly described as an idealized measure intended to support early-stage planning and identification of potential bottlenecks

Critically, Appendix Q emphasizes that MTT does not represent actual evacuation conditions. The methodology does not account for signal operations, queue spillback, merging behavior, traffic incidents, smoke-related speed reductions, vehicle mix, phased evacuations, interactions with

neighboring communities, or fire-related roadway disruptions. As such, MTT is best understood as a conceptual benchmark—useful for establishing an order-of-magnitude sense of evacuation feasibility and highlighting where constraints may exist, but insufficient on its own for evaluating real-world evacuation performance or mitigation effectiveness.

Microsimulation evacuation modeling directly aligns with the intent of the MTT framework while addressing its known limitations. Both approaches seek to understand whether evacuation demand can be processed through a constrained roadway system; however, microsimulation does so using dynamic, time-dependent modeling rather than static assumptions. By explicitly representing individual vehicle movements, intersection control, traffic signal timing, lane-changing, merging, and queue formation, microsimulation provides a more realistic depiction of evacuation conditions under stressed, emergency scenarios. Appendix Q itself acknowledges the existence and value of dynamic evacuation modeling as a more advanced analytical approach, reinforcing that microsimulation is a logical extension of the MTT framework

A central insight provided by microsimulation is that roadway capacity during evacuations is variable and context-dependent, not fixed. A roadway segment may have sufficient geometric capacity to carry high volumes of traffic, but if downstream intersections or links are congested, queue spillback can significantly reduce its effective throughput. Conversely, if congestion or phasing upstream limits the number of vehicles entering a corridor, downstream facilities may never reach their theoretical capacity, regardless of design. Microsimulation captures these interactions, demonstrating that evacuation performance is governed by network-wide dynamics rather than a single bottleneck or capacity value.

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TO:	Mike Huff; Dudek Austin Ott, Dudek
FROM:	Phuong Nguyen, PE; CR Associates (CRA)
DATE:	January 9, 2025
RE:	Beaumont Heights Fire Evacuation Analysis – Technical Memorandum

The purpose of this technical memorandum, which was prepared in coordination with the fire professionals at Dudek, is to assess the time required for emergency evacuation from the site of the Beaumont Heights Project (the "Project"), under several scenarios, assuming a wind-driven fire that results in a required evacuation affecting the project site and surrounding community.[1] The purpose of the traffic evacuation simulations and related analysis presented here is to identify the vehicle travel times required under the various simulated evacuation events.

Background and Purpose

This memorandum provides a summary of the various traffic simulation analyses conducted relative to evacuation of the Project site and surrounding community due to a wildfire. The simulations have been conducted for a variety of evacuation scenarios described below. Modeling potential evacuation traffic impacts requires that numerous assumptions be made to address the many variables that would impact a real-life evacuation scenario, including the number of existing vehicles in the community, the number of project vehicles that will need to evacuate, the roadway capacities and whether enhancements are provided (e.g., extra lanes, lane widening, signaling intersections), the total number of intersections and how they will be operating, the final destination, the targeted evacuation area, the total mobilization time, vegetation communities, weather and wind, fire spread rates, humidity, topography, risk to homes, locations of ignitions and new fire starts, lead time needed, etc. There are thousands of potential model scenarios, and each fire scenario poses variations that regularly change and would be reassessed "real-time" during a wildfire. Agencies involved in implementing an evacuation order may be informed by the project-specific modeling in this memorandum but will also rely on situational awareness and wildfire pre-plans, which act as operational tools to provide high-level fire assessments of assets at risk, preferred evacuation approaches, and safety information to inform evacuation decision-making.

The following analysis is intended to present representative evacuation scenarios using a data driven approach, conservative assumptions, and the modeling technology considered to be industry leading and most applicable to the conditions being analyzed[2]. In an actual emergency, fire command will take into account numerous factors including fire location and spread rates, wind speeds and direction, humidity, topography, fuel loading, emergency access routes, evacuation routes, time needed to evacuate, and other variables, and will issue specific directives consistent with the process and protocols outlined in the County of Riverside's and the City of Beaumont Emergency Operations Plans. The evacuation traffic model used herein is appropriate for planning and comparison purposes and would provide useful information to agencies and emergency managers regarding evacuation timeframes for purposes of informing managers' issuance of specific evacuation orders. For that reason, it will be provided to agencies and emergency managers; however, during a wildfire, employees, residents, and visitors should comply with directives from authorities and first responders conducting the evacuation or emergency response, not rely on this evacuation traffic model.

[1] This memorandum was prepared with technical input regarding fire behavior from Dudek's fire protection planning team.
[2] This evacuation analysis was conducted using the Vissim microsimulation software, which is one of the leading microsimulation software models available that can accurately replicate human driving behavior during an evacuation, including yielding at a congested location and delay due to stop & go traffic.

This technical memorandum and the accompanying analyses were prepared in accordance with the California Governor's Office of Planning and Research Fire Hazard Planning Technical Advisory, the California Office of the Attorney General's Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under CEQA, and guidance for determining evacuation times. The analysis also incorporates relevant information from the County of Riverside Emergency Operations Plan, the City of Beaumont Emergency Operation Plan, and associated annexes.

The scenarios analyzed in this study are informed by a review of local fire history and lessons learned from recent events, including the Bogart Fire (2016), Manzanita Fire (2017), Palmer Fire (2017), Beaumont Fire (2019), Apple Fire (2020), Highland Fire (2023), as well as the Palisades, Eaton, Kenneth, and Hughes Fires in 2025.

Advancements in fire behavior science, combined with improved understanding of area topography, fuel types, and the integration of new technologies, have led to a more refined approach to evacuations. Recent wildfire events have increasingly relied on targeted and strategic evacuations, as opposed to the widespread, area-wide mass evacuations that were standard protocol prior to approximately 2015. Although targeted evacuations represent the current best practice, it is important to acknowledge the presence of "shadow evacuees," which refers to individuals who choose to evacuate without receiving an official evacuation order. The proportion of shadow evacuees is highly *uncertain and may range from 25 percent to 75 percent. Therefore, to ensure a conservative analysis,* this study assumes a mass evacuation scenario.

The evacuation analysis is based on conservative assumptions intended to represent a worst-case scenario. Specifically, the analysis assumes a Saturday afternoon when the Project is operating at full capacity, all nearby residents are at home and surrounding industrial and retail uses are fully open and occupied at the time the evacuation order is issued. While CEQA only requires that reasonable scenarios be analyzed, this more extreme case was selected as an added precaution to prioritize public safety.

In practice, the actual number of evacuees would likely be lower depending on the timing of the evacuation order. For example, if an evacuation were ordered during a weekday afternoon, early morning, or late evening, there would likely be fewer people present in the area. According to the Institute of Transportation Engineers Parking Generation Manual, sixth edition, time of day parking demand varies substantially by land use. Residential areas typically experience peak parking demand, and therefore the highest number of vehicles is present, in the late evening and early morning. Industrial uses tend to peak during the late morning and early afternoon. As a result, the actual number of vehicles requiring evacuation and the total evacuation time may be significantly less than what is reported in this analysis, depending on when the evacuation is ordered.

The roadway network and vehicle input assumptions were selected to represent a "worst-case" evacuation scenario, specifically, a Saturday afternoon when the Project is operating at full capacity, all residents of adjacent communities are at home, and nearby industrial and retail land uses are fully active at the moment the evacuation order is issued. While CEQA does not require analysis of such an extreme scenario, only those reasonable standards and criterion be applied, whereas this analysis adopts a more conservative approach as an added precaution. During an actual wildfire event, it is likely that not all residents would be present in the surrounding communities, and the Project's parking lot would not be at full occupancy. Except of the time-of-day parking demands are provided in Attachment A.

Project Description

The proposed Project involves the development of four industrial buildings along with associated site improvements. Since the future tenants of the Project are currently unknown, the Environmental Impact Report (EIR) and this evacuation analysis are based on maximum development assumptions to accommodate a range of potential future tenants. Accordingly, this evacuation analysis is based on a conservative assumption of building square footage that exceeds the currently proposed development area. A comparison of the assumed and proposed square footage is provided in **Table 1**.

Table 1 – Studied vs. September 2025 Site Plan Square Footage

Building	Studied (SF)	9/24/2025 Project Site Plan (SF)
1	688,200	636,937
2	1,488,600	1,386,044
3	1,675,600	1,488,920
4	1,847,600	1,666,305

Primary site access for all buildings will be from Beaumont Avenue (SR-79), with one access point aligned with the existing California Avenue and a second future driveway proposed between Buildings 2 and 3, both designed for full access. Project development is planned to occur in four phases, moving from north to south, over the period from 2027 to 2045.

The TA provides a comprehensive analysis of each of the development phases, and includes the the following scenarios:

- Existing (2024) Conditions
- Background (2027) Conditions
- Background (2027 – Phase 1) With Project Conditions
- Background (2029) Conditions
- Background (2029 – Phase 1 + Phase 2) With Project Conditions
- Background (2030) Conditions
- Background (2030 – Phase 1 through Phase 3) With Project Conditions
- Background (2032) Conditions
- Background (2032 – Phase 1 through Phase 4 or Project Buildout) With Project Conditions
- Cumulative No Project Conditions (2045)
- Cumulative With Project Conditions (2045 – Project Buildout)

As shown, the TA includes a total of 11 different scenarios, whereas the evacuation analysis focuses on later phases when the project is more fully built out and would generate the greatest number of vehicles during an evacuation. The evacuation analysis therefore evaluates the following scenarios:

1. Existing (2024) Conditions
2. Background (2030) Conditions
3. Background (2030 – Phase 1 through Phase 3) With Project Conditions
4. Cumulative No Project Conditions (2045)
5. Cumulative With Project Conditions (2045 – Project Buildout)

The evacuation analysis incorporates the same set of cumulative projects and roadway improvements as those evaluated in the traffic analysis. Given the uncertainty surrounding the timing of cumulative project development, it is conservatively assumed that all such projects will be fully built and occupied by the year 2030. Additional descriptions of each scenario are provided in subsequent sections.

Figure 1 displays the proposed Project location and **Figure 2** displays the proposed Project site plan.

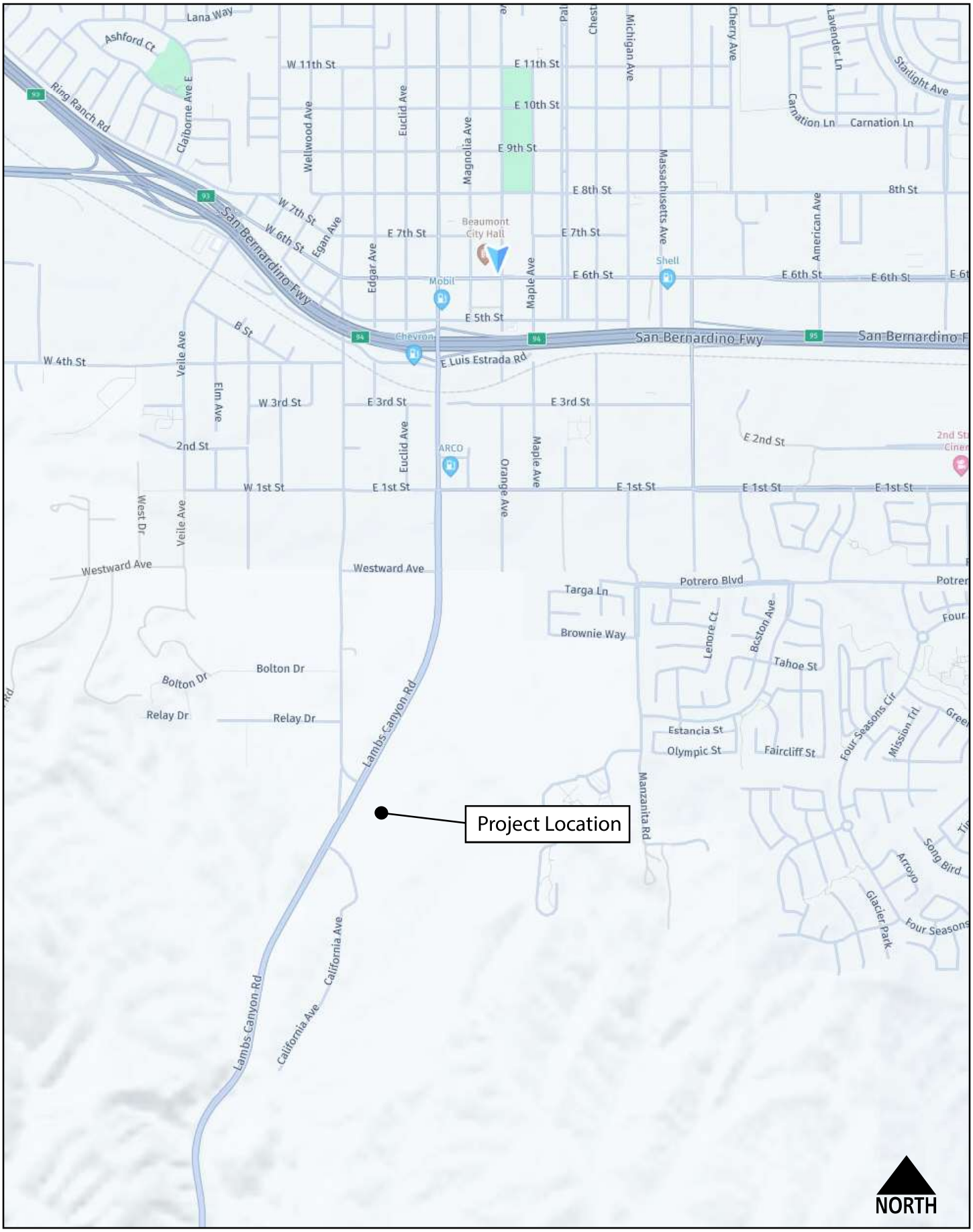

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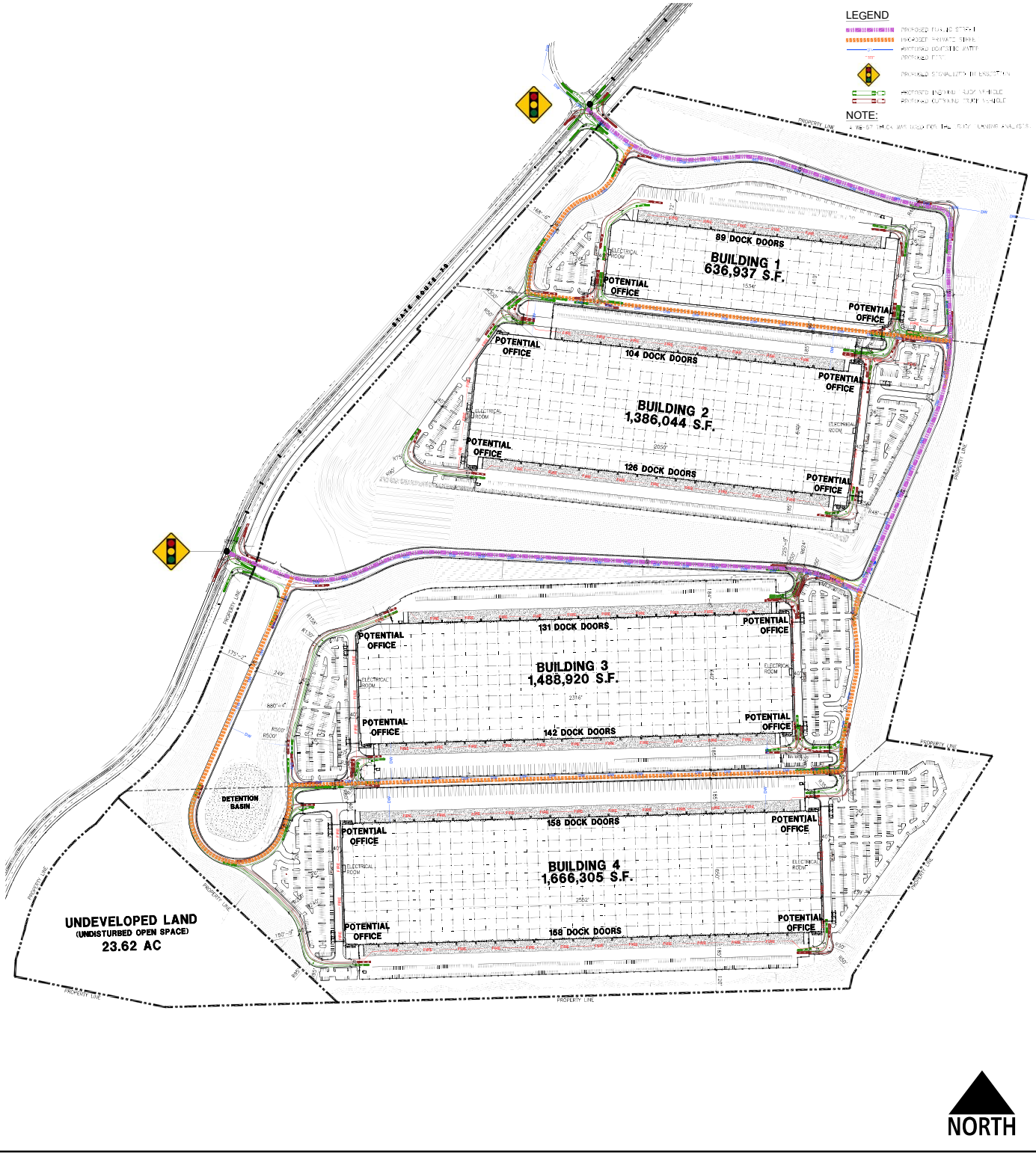
Figure 1
Project Location



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Technical Memorandum

Figure 2
Project Site Plan

Methodological Approach

This evacuation analysis was performed for the Project to estimate the approximate time required for employees, visitors, residents of the Project, and surrounding community members to evacuate to nearby urban areas in the event of a wildfire emergency. In practice, evacuation strategies are highly dependent on the scale, location, and progression of a wildfire. Current evacuation practice typically targets only the area in immediate danger, which allows for more effective evacuation operations, reduces unnecessary congestion and gridlock, and preserves roadway capacity for emergency response vehicles. Under these typical conditions, first responders and law enforcement personnel actively manage evacuation traffic at key intersections and corridors in accordance with established protocols outlined in the County of Riverside Operational Area Emergency Support Function #16: Evacuation and Re-Entry (Riverside County ESF #16) and the City of Beaumont Emergency Operations Plan (EOP).

Depending on the location and extent of the wildfire, the lead agency for evacuation operations may vary. If a wildfire originates on the west or southwest side of the Project site, within unincorporated Riverside County, it is likely that the County of Riverside Sheriff's Department would serve as the lead agency for evacuation operations. Conversely, if a wildfire originates within the incorporated limits of the City of Beaumont, the City of Beaumont Police Department would typically assume the lead role. However, wildfires frequently cross jurisdictional boundaries, and under such circumstances a joint evacuation operation between the County of Riverside Sheriff's Department and the City of Beaumont Police Department would be implemented. Joint operations, including unified command, coordination procedures, and shared responsibilities, are explicitly outlined in both the County and City EOPs to ensure seamless evacuation management across jurisdictional boundaries.

Riverside County ESF #16 provides a comprehensive framework for managing evacuations and ensuring safe re-entry following emergencies. The purpose of the plan is to guide the coordinated evacuation of people and animals from hazardous areas to areas of safety and applies to all jurisdictions and special districts within the County. While the City of Beaumont EOP does not organize emergency response functions using numbered Emergency Support Functions in the same manner as Riverside County, it does designate an Evacuation and Re-Entry Unit Leader within its Emergency Operations Center structure. This Unit Leader is responsible for directing evacuation and re-entry activities and making operational decisions based on professional judgment, situational awareness, and incident-specific conditions. As a result, although structured differently, the City of Beaumont's evacuation and re-entry approach would be expected to be functionally similar to the processes and objectives outlined in Riverside County ESF #16, including coordinated traffic management, phased evacuations where feasible, and integration with County and regional partners.

Early warning and evacuation timing can vary significantly based on wildfire behavior, fire origin, weather conditions, and available response time. In some cases, particularly where a fire is advancing slowly or forecast conditions indicate a heightened but not immediate threat, early warning notifications may be issued out of an abundance of caution, potentially up to 72 hours in advance. This early notification window allows agencies to coordinate logistics, stage resources, identify shelters, and prepare transportation assets. In other cases, particularly for fast-moving wildfires driven by wind or steep topography, evacuations may be ordered with little or no advance notice, requiring rapid, last-minute evacuation of affected populations.

For the purposes of the evacuation analysis conducted herein, a highly conservative scenario was assumed. The analysis assumes a last-minute evacuation condition in which 100 percent of the affected population evacuates simultaneously, with no advance warning. Due to the assumed short

notice, the analysis further assumes that law enforcement personnel would not be in position to manage traffic or provide intersection control at the onset of evacuation. As a result, vehicles are assumed to compete with one another for available roadway capacity, without active traffic management or prioritized movements. This assumption represents a worst-case and intentionally conservative scenario and is expected to overstate congestion and evacuation times relative to more typical, managed evacuation conditions where phased evacuations, targeted zones, and law enforcement traffic control would be implemented.

When the incident commander (IC) deemed certain areas at risk due to fire conditions, an evacuation order was issued. An evacuation order should be used when there is potential for or an actual threat to civilian life, typically this could range between 1 to 2 hours[3] of such determination or when the IC deems it necessary to protect civilians. The purpose of an evacuation warning, in comparison, is to alert community members in a defined area of a potential threat to life and property from an emergency incident. An evacuation warning may be issued when the potential or actual threat to civilian life is more than 2 hours away.

During the evacuation process, which can proceed aided by the roadside fuel modification zones and unexposed corridors, wildfire progress may be slowed by fire-fighting efforts that would likely include fixed wing and helicopter fire-fighting assets. Hand crews would also be deployed toward containment. Note that none of the evacuation scenarios presented here utilize counter-flow lanes, as these lanes are reserved for first responders, law enforcement, and fire fighters in case of unforeseen circumstances.

Scenario Description

This section provides a description of each of the different evacuation scenarios, including the number of evacuating vehicles for each of the land uses. It is assumed that the proposed Project's evacuation plan would provide clear instructions for response once an evacuation order is issued. Employees are expected to evacuate using their personal vehicles, while operators of heavy vehicles would depart using their tractor units with a single trailer attached. Additionally, it is assumed that law enforcement would restrict all inbound traffic once an evacuation order is in effect.

Determining the evacuation travel time is a common method for evaluating project evacuations as it focuses on the active period when “wheels are rolling”. Note that while some households may leave the area prior to an evacuation order for personal reasons, for a conservative analysis, all scenarios presented here are based on the presumption that all the households and vehicles would leave together once an evacuation order is issued.

As discussed previously, the evacuation analysis in this report evaluates five scenarios: (1) Existing (2024) Conditions, (2) Background (2030) Conditions, (3) Background (2030 – Phase 1 through Phase 3) With Project Conditions, (4) Cumulative No Project Conditions (2045), and (5) Cumulative With Project Conditions (2045 – Project Buildout). Scenarios 1, 2, and 4 represent total evacuating vehicles and evacuation times under “without Project” conditions, while Scenarios 3 and 5 address the “with Project” conditions.

For purposes of the evacuation analysis, it was assumed that a wildfire originates to the south or southwest of the Project site, then spread northward, resulting in a mass evacuation of the Project site and the surrounding area. This assumption was informed by a review of historical wildfire perimeter

[3] ESF #16 does not specify a defined threshold; however, guidance can be inferred from neighboring jurisdictions, such as the San Diego County Operational Area Evacuation and Repopulation Policy #8-B, available at https://sdoparea.org/wp-content/uploads/documents/8B%20Evacuation%20and%20Repopulation.pdf.

data from the CAL FIRE Historical Wildland Fire Perimeters[4] database and the Interagency Wildland Fire Perimeter History[5] dataset. These datasets indicate that wildfires with large footprints that have necessitated mass evacuations in and around the City of Beaumont have historically originated within the wildland–urban interface (WUI) areas to the south and southwest of the City. These areas are generally characterized by rugged terrain, heavier fuel loads, limited roadway access, and longer detection and response times. As a result, fires originating in these areas have a greater potential to grow rapidly before firefighting resources can intervene, increasing the likelihood of widespread evacuations.

While it is technically feasible for a wildfire to originate to the north or northeast of the Project site, these areas are predominantly urbanized and characterized by a dense, grid-like roadway network and higher population density. Such conditions generally allow for faster fire detection, quicker emergency response, and more immediate access for firefighting equipment, thereby reducing the likelihood that a fire would grow to a scale requiring evacuation of the Project site. Although a scenario in which a fire originates to the north or northeast and is subsequently driven southward by Santa Ana wind conditions cannot be entirely discounted, the probability of such an event resulting in a large-scale evacuation is considered lower than that of a fire originating in the more rugged WUI areas with fewer opportunities for early intervention.

Under this assumed scenario, evacuating vehicles are expected to travel generally north toward I-10 and Downtown Beaumont. The analysis area was defined to capture the potential for evacuees from surrounding land uses to utilize the same or adjacent evacuation routes as the Project. Although the primary evacuation route for the Project is SR-79/Beaumont Avenue/California Avenue, it is anticipated that some evacuating traffic from land uses to the west and east could also rely on this corridor to access I-10 and Downtown Beaumont. To ensure a conservative analysis, the study area encompasses all potential evacuation zones, including areas with access to alternative routes.

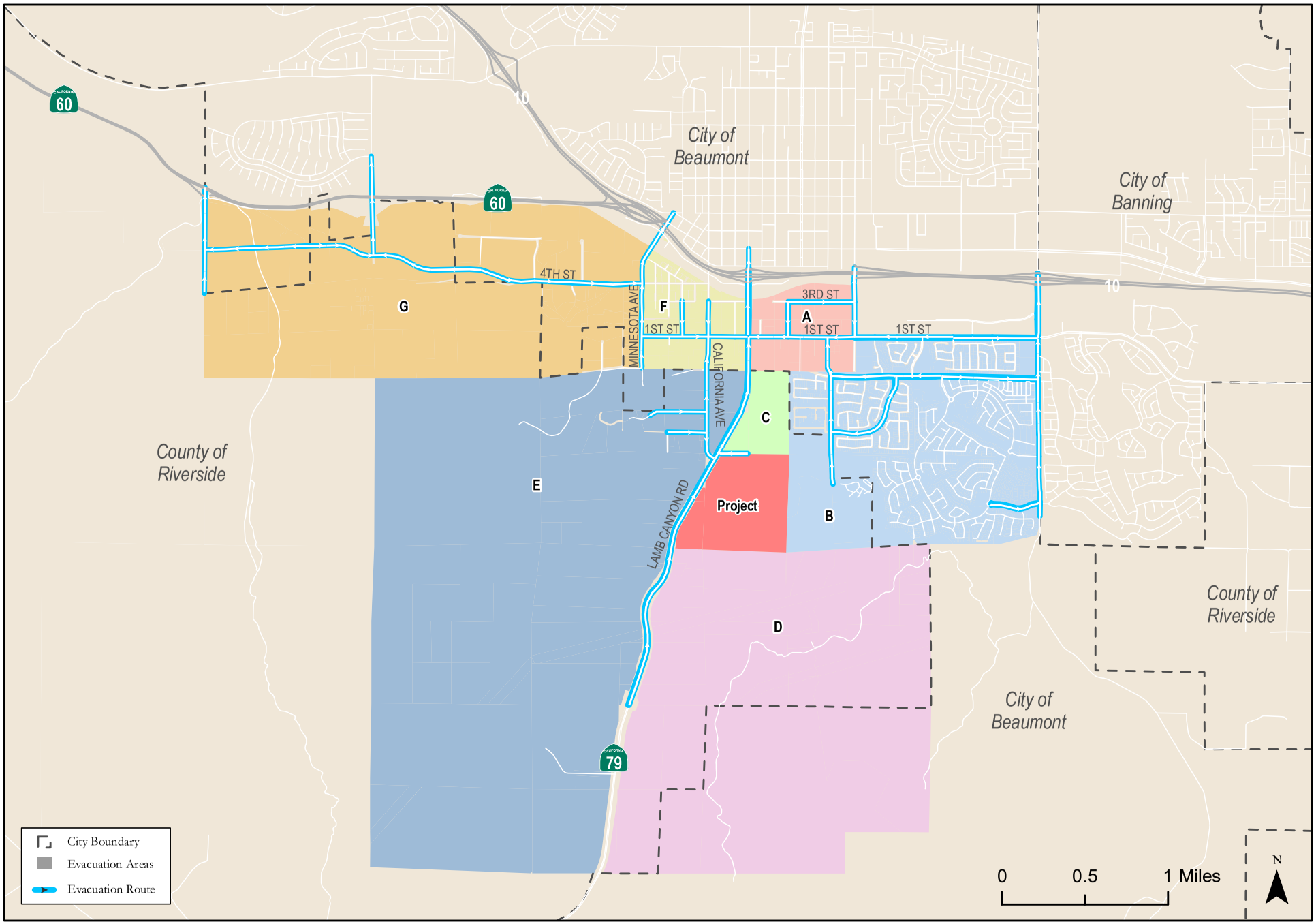
The County of Riverside uses the Genasys Protect Evacuation Zone alert system, which subdivides the evacuation zones listed above into smaller zones for evacuation operations. However, for the purposes of this analysis the larger zones, which in some cases encompass multiple Genasys Protect evacuation zones, were used. Genasys Protect Evacuation Zones were grouped into “evacuation areas,” labeled Area A through Area G. These groupings reflect shared evacuation routes and/or common destinations. For example, Area A includes industrial and certain residential uses that would, during an evacuation, use either Pennsylvania Avenue or SR-79/Beaumont Avenue to reach I-10 and Downtown Beaumont. In contrast, Area B primarily consists of residential uses likely to use Pennsylvania Avenue and South Highland Springs Avenue. Certain sites, such as the Sunlakes Village Shopping Center, were excluded from the analysis, as their evacuation routes do not overlap with those of the Project, and their limited surrounding vegetation makes them less vulnerable[6]. A comparison between the zones used in this analysis and the Genasys Protect Evacuation Zones is provided in Attachment A.

Figure 3 illustrates the evacuation zones within the study area and the corresponding evacuation roadways serving each zone. Evacuation roadways are defined as circulation element roadways that provide outbound access from each evacuation zone.

[4] https://www.arcgis.com/home/item.html?id=c3c10388e3b24cec8a954ba10458039d

[5] https://data-nifc.opendata.arcgis.com/datasets/nifc::interagencyfireperimeterhistory-all-years-view/explore?location=33.917551%2C-116.976151%2C12.41

[6] This does not preclude the possibility that such areas could face an evacuation order under different fire scenarios; however, if a fire is located south of the Project site, it is more likely that Incident Command would prioritize evacuation of land uses in closest proximity to the fire.



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Technical Memorandum

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Figure 3

Evacuation Areas and Routes

Evacuating Vehicles

The number of vehicles evacuating under each scenario was calculated based on published industry sources, including the American Community Survey, the Institute of Transportation Engineers (ITE) Parking Generation Manual, and City of Beaumont vehicle ownership statistics. For residential land uses, the total number of evacuating vehicles was determined by multiplying the average vehicle ownership rate for the City of Beaumont, which is 2.2 vehicles per household, by the number of households within each evacuation area. This calculation also accounts for specialized residential uses such as RV parks, where it is assumed that, in addition to the RVs parked onsite, there would be supplementary vehicles present, and that the RV parks would be at full occupancy during an evacuation event.

For industrial and commercial land uses, the number of evacuating vehicles was estimated by multiplying the total building square footage by the applicable average parking rate from the ITE Parking Generation Manual. It is assumed that all parked vehicles would evacuate in response to an evacuation order, resulting in a conservative estimate. Additionally, the proportion of heavy vehicles used in the analysis is consistent with the assumptions from the Traffic Analysis, which indicate that between 4 percent and 5 percent of vehicles in industrial areas are heavy vehicles. This is higher than the standard heavy vehicle percentage of 2 percent[7], which further reinforces the conservative nature of the analysis.

Except for Scenario 1, all other scenarios incorporate cumulative projects identified in the traffic analysis. These cumulative projects represent anticipated developments or land use changes expected to occur by the corresponding analysis years. For the purpose of the evacuation analysis, cumulative projects located within the same evacuation area or in adjacent areas were included, or partially included, in the calculation of total evacuating vehicles. The inclusion of each cumulative project was determined based on its proximity to the study area and the specific evacuation routes available to it. If a cumulative project was situated such that it had access to evacuation routes outside the study area, only a proportional share of its evacuating vehicles was included in the analysis. This approach ensures that the evacuation vehicle totals accurately reflect the potential demand on the primary evacuation routes being analyzed, while avoiding overestimating vehicles that may utilize alternative routes.

The detailed calculation of evacuating vehicles for each study area is shown in **Table 2** and the detailed calculations are included in **Attachment A.**

[7] https://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_599.pdf (p.5)

Table 2 – Evacuating Vehicles

Scenario	Number of Evacuating Vehicles by Area								Total
	A	B	C	D	E	F	G	Project	
Scenario 1 - Existing (2024) Conditions	632	7,812	25	86	1,008	567	5,052	N/A	15,182
Scenario 2 - Background (2030) Conditions	1,156	8,124	26	89	1,048	588	5,256	N/A	16,287
Scenario 3 - Background (2030 – Phase 1 through Phase 3) With Project Conditions	1,156	8,124	26	89	1,048	588	5,256	2,584	18,871
Scenario 4 - Cumulative No Project Conditions (2045)	1,334	9,372	30	103	1,210	678	6,064	N/A	18,791
Scenario 5 - Cumulative With Project Conditions (2045 – Project Buildout)	1,334	9,372	30	103	1,210	678	6,064	3,822	22,613

Source: CR Associates (2025), US Census Bureau (2025), Google Maps (2025).

Extreme Wildfire Event

The evacuation analysis presented here assumes a southerly wind pattern, meaning wind blowing from south to north. Although this wind direction is relatively uncommon in Beaumont, it represents the scenario most likely to require a full evacuation of the Project site and adjacent areas, as it would drive fire toward the developed properties to the north. In reality, the prevailing wind patterns in Beaumont are predominantly westerly or northwesterly, as documented by WeatherSpark[8] and regional wind studies[9]. These winds are channeled through the San Gorgonio Pass for most of the year, making them the typical wind direction experienced in the area. Under a westerly wind scenario, a fire originating to the west would primarily threaten areas west of the Project site, such as Area E and Area G, and might not necessitate evacuation of areas to the east, such as Area A and Area B. Nonetheless, to ensure a conservative and comprehensive analysis, it is assumed that Areas A through G, as well as the Project site, would evacuate simultaneously under all scenarios.

In California, wildfire-related large-scale evacuations are almost exclusively associated with wildfires that occur on extreme fire weather days, also known as "Red Flag Warning" days. These days occur when relative humidity drops to low levels and strong winds from the north/northeast are sustained. With climate change, periods in which such wildfires occur may increase. During Red Flag Warning days, vegetation is more likely to ignite and fire spread is more difficult to control. In Riverside County, these extreme weather days typically occur during limited periods in the late summer, fall and, occasionally, in the spring, but may occur at other times on a less frequent basis. Currently, it is not common to experience more than 15 to 20 Red Flag Warning days in a typical year. Wildfires that occur during these periods of extreme weather are driven by winds –referred to as "Santa Ana" winds – that originate in the north or east and blow toward the south or west. Fires driven by these winds move very quickly, making them difficult to control. In response to such fires, emergency managers typically activate pre-planned evacuation triggers that require down-wind communities to sequentially be notified to evacuate and move to nearby urbanized areas prior to the fire's encroachment.

Wildfires that occur on non-extreme weather days behave in a much less aggressive manner and pose fewer dangers to life and property because they include less aggressive fire behavior and are easier to control. Terrain and fuel are typically the wildfire drivers. During these non-extreme weather days, vegetation is much more difficult to ignite and does not spread fire as rapidly. In these situations,

[8] https://weatherspark.com/y/2098/Average-Weather-in-Beaumont-California-United-States-Year-Round
[9] https://www.markgps.com/palm-springs-wind-map.html

firefighters have a very high success rate of controlling fires and keeping them under 10 acres. CALFIRE estimates that 90% of all vegetation fires occur during normal, onshore weather conditions and that such fires account for only 10% of the land area burned. Conversely, the 10% of wildfires that occur during extreme fire weather account for 90% of the land area burned. This data highlights that the most dangerous fire conditions are those related to a fire that moves rapidly due to high winds and low humidity, whereas under normal conditions fires are likely to be controlled with no evacuation or possibly limited, focused evacuations.

Primary Evacuation Routes

The analysis presented here selects a reasonable evacuation route for the extreme weather scenario and a fire traveling from south to north. In each scenario, the evacuation areas are expected to use local roads and SR-79 to reach I-10 and Downtown Beaumont. Detailed evacuation analysis information is provided in **Attachment B**.

No contraflow lanes were utilized to provide additional evacuation capacity under the analysis. Contraflow or lane reversal involves reversing the usual flow of one or more lanes to serve additional outbound evacuation traffic, increasing outbound traffic capacity to move people away from the wildfire or other hazards. Such a strategy can be used to eliminate bottlenecks in communities with road geometrics that prevent efficient evacuations or to otherwise hasten and facilitate traffic flow. However, among the considerations in planning emergency contraflow are whether sufficient traffic control officers are available, potential negative impact on responding fire apparatus, access management, merging, exiting, safety concerns, and labor requirements.[10] None of the evacuation scenarios analyzed here assumed contraflow traffic flow would be implemented; instead, two-way travel flow was utilized, with evacuating vehicles traveling outbound to the Safe Zone, and inbound lanes assumed to be reserved for use by first responders, law enforcement, and fire fighters. Based on recent practice, it is reasonably assumed that first responders or law enforcement will direct traffic at all major intersections during the evacuation process. Should evacuation managers determine that contraflow is preferred or necessary in the context of an actual wildfire event, contraflow remains a tool in the evacuation manager's toolbelt that would increase evacuation capacity and decrease evacuation times.

Analysis Methodology

To analyze evacuation events, CR Associates (CRA) utilized PTV Vissim, a widely recognized microscopic, multimodal traffic simulation software, to model and assess evacuation scenarios. Vissim has been widely used in evacuation and emergency planning research and real-world applications[11].

Vissim is capable of simulating detailed traffic operations by representing each individual vehicle and driver in the network, allowing for nuanced modeling of complex behaviors such as lane changing, acceleration, and gap acceptance, all of which are critical to realistic evacuation analysis. In these simulations, Vissim accounts for roadway capacity constraints and dynamically tracks every vehicle's movements at 0.1-second intervals, providing a high-resolution dataset for measures of effectiveness such as average vehicle speed, queue lengths, travel times, and congestion hotspots.

This modeling approach enables the simulation to capture the unique traffic dynamics that often emerge during mass evacuations, including increased driver stress, atypical routing decisions, and changes in flow rates. For this study, a total of 20 simulation runs were performed to generate a

[10] Dudek July 2014. "Wildland Fire Evacuation Procedures Analysis" for City of Santa Barbara, California, page 65.
[11] https://www.sciencedirect.com/science/article/abs/pii/S1569190X16302520, https://journals.sagepub.com/doi/10.3141/2312-13, https://rosap.ntl.bts.gov/view/dot/16885

robust statistical sample and ensure reliability in the results, allowing for assessment of both average conditions and the variability in outcomes during evacuation events.

Evacuation Analysis & Results

Based on the analysis methodology described above, **Table 3,** below**,** reflects the evacuation times for each scenario depicted on an area-by-area basis (Areas A through G), along with the Project's evacuation times and the Project's *effect* on evacuation times for Areas A through G. The evacuation time for each area is calculated based on the arrival of the last vehicle from that area at I-10/Downtown Beaumont.

The summaries for each study scenario, as presented in detail in Table 3, are as follows:

Table 3 – Evacuation Time Summary – All Scenarios

Scenario	# Vehicles	Evacuation Time (Hours: Minutes)							
		A	B	C	D	E	F	G	Project
Scenario 1 - Existing (2024) Conditions	15,182	0:29	2:23	0:49	0:48	1:08	0:54	1:35	N/A
Scenario 2 - Background (2030) Conditions	16,287	0:53	3:18	0:47	0:46	0:48	0:54	3:32	N/A
Scenario 3 - Background (2030 – Phase 1 through Phase 3) With Project Conditions	18,871	0:53	3:18	0:49	1:08	1:20	0:58	3:36	3:45
Δ Evacuation Time (Scenario 3 – Scenario 2)	**N/A**	**0:00**	**0:00**	**0:02**	**0:22**	**0:32**	**0:04**	**0:04**	**3:45**
Scenario 4 - Cumulative No Project Conditions (2045)	18,791	1:04	3:49	0:52	0:52	0:54	1:01	4:07	N/A
Scenario 5 - Cumulative With Project Conditions (2045 – Project Buildout)	22,613	1:04	3:52	0:53	1:23	1:37	1:08	4:11	4:33
Δ Evacuation Time (Scenario 5 – Scenario 4)	**N/A**	**0:00**	**0:03**	**0:01**	**0:31**	**0:43**	**0:07**	**0:04**	**4:33**

Source: CR Associates (2025).

Scenario 1 - Existing (2024) Conditions

Scenario 1 represents existing (2024) conditions, with an estimated 15,182 vehicles requiring evacuation. Under these conditions, evacuation times for each area are as follows: Area A evacuates in 29 minutes, Area B in 2 hours and 23 minutes, Area C in 49 minutes, Area D in 48 minutes, Area E in 1 hour and 8 minutes, Area F in 54 minutes, Area G in 1 hour and 35 minutes, and there is no Project component in this scenario.

Scenario 2 - Background (2030) Conditions

Scenario 2 reflects background (2030) conditions, accounting for anticipated growth and an increase in evacuating vehicles to 16,287. As a result, evacuation times increase in some areas: Area A takes 53 minutes, Area B takes 3 hours and 18 minutes, Area C takes 47 minutes, Area D takes 46 minutes, Area E takes 48 minutes, Area F takes 54 minutes, Area G takes 3 hours and 32 minutes, and the Project area is not yet included in this scenario.

Scenario 3 - Background (2030 – Phase 1 through Phase 3) With Project Conditions

Scenario 3 introduces the proposed Project, evaluating background (2030) conditions with Phases 1 through 3, resulting in 18,871 vehicles requiring evacuation. In this scenario, evacuation times are 53 minutes for Area A, 3 hours and 18 minutes for Area B, 49 minutes for Area C, 1 hour and 8 minutes

for Area D, 1 hour and 20 minutes for Area E, 58 minutes for Area F, 3 hours and 36 minutes for Area G, and 3 hours and 45 minutes for the Project area. Compared to Scenario 2, the addition of the Project results in incremental increases in evacuation times, most notably 22 minutes longer for Area D, 32 minutes for Area E, 4 minutes for Areas F and G, and 3 hours and 45 minutes added for the Project itself.

Scenario 4 - Cumulative No Project Conditions (2045)

Scenario 4 evaluates cumulative (2045) conditions without the Project, with a total of 18,791 vehicles. Under this scenario, evacuation times are 1 hour and 4 minutes for Area A, 3 hours and 49 minutes for Area B, 52 minutes for Area C, 52 minutes for Area D, 54 minutes for Area E, 1 hour and 1 minute for Area F, and 4 hours and 7 minutes for Area G. The Project area is not included in this scenario.

Scenario 5 - Cumulative With Project Conditions (2045 – Project Buildout)

Scenario 5 examines cumulative (2045) conditions with full Project buildout, resulting in 22,613 vehicles requiring evacuation. Evacuation times increase to 1 hour and 4 minutes for Area A, 3 hours and 52 minutes for Area B, 53 minutes for Area C, 1 hour and 23 minutes for Area D, 1 hour and 37 minutes for Area E, 1 hour and 8 minutes for Area F, 4 hours and 11 minutes for Area G, and 4 hours and 33 minutes for the Project area. Compared to Scenario 4, the addition of the Project results in evacuation time increases of 3 minutes for Area B, 1 minute for Area C, 31 minutes for Area D, 43 minutes for Area E, 7 minutes for Area F, and 4 minutes for Area G, with a total evacuation time of 4 hours and 33 minutes for the Project area.

Analysis and Conclusion

Neither CEQA, nor the County has adopted numerical time standards for determining whether an evacuation timeframe is appropriate. Public safety, not time, is generally the guiding consideration for evaluating impacts related to emergency evacuation. The City considers a project's impact on evacuation significant if the project will significantly impair or physically interfere with implementation of an adopted emergency response or evacuation plan; or if the project will expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

In any populated area, safely undertaking large-scale evacuations may take several hours or more and require moving people long distances to designated areas. Further, evacuations are fluid and timeframes may vary widely depending on numerous factors, including, among other things, the number of vehicles evacuating, the road capacity to accommodate those vehicles, evacuees' awareness and preparedness, evacuation messaging and direction, and on-site law enforcement control. The "Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act"[12] guidance from the California Office of the Attorney General suggests that jurisdictions set benchmarks of significance based on past successful evacuations or on those from communities in similar situations.

A recent study titled "Review of California Wildfire Evacuation from 2017 to 2019[13]" provides more insights on the topic. This research involved interviews with 553 individuals (297 evacuees affected by various fires) including the Creek Fire, Rye Fire, Skirball Fire, and Thomas Fire. The study aimed to understand the decision-making processes of these individuals during the fires, such as whether to evacuate or stay, when to leave, the paths taken, chosen shelters, destinations, and modes of transportation. According to this research, the time it took for evacuations ranged from under 30 minutes to over 10 hours. From this dataset[14], the average evacuation time for the Creek Fire was

[12] https://oag.ca.gov/system/files/attachments/press-docs/2022.10.10%20-%20Wildfire%20Guidance.pdf
[13] https://escholarship.org/uc/item/5w85z07g
[14] 2018 Carr Wildfire Evacuation Survey Data | Zenodo

found to be 3 hours and 40 minutes, involving 115,000 people[15]. For the Thomas Fire, the average time was 4 hours and 25 minutes, impacting 104,607 individuals.

California fire and law enforcement agencies have integrated training, experience, and technology to assist in successful evacuations, which focus on moving persons at risk to safer areas before a wildfire encroaches on a populated area. Timeframes for moving people vary by site specifics, population, road capacities and other factors and there is no one threshold that would be appropriate to all locations. There are no established thresholds for evacuation times for this Project or at the time of this plan's preparation, for any California community, to the knowledge of the authors. This is primarily because every location and fire scenario are unique. While it may take one community 20 minutes to evacuate safely, it is not a valid assumption to consider a 3-hour evacuation for another community as unsafe. The 3-hour evacuation can be very safe while the 20-minute evacuation may be unsafe due to the conditions and exposures along the evacuation routes.

The City of Beaumont and County of Riverside (City/County) has historically had an extremely high success rate for safely evacuating large numbers of people and doing so in a managed and strategic way using available technological innovations. Safely undertaking large-scale evacuations may take several hours or more and require moving people long distances to designated areas. Further, evacuations are fluid and timeframes may vary widely depending on numerous factors, including, among other things, the number of vehicles evacuating, the road capacity to accommodate those vehicles, evacuees' awareness and preparedness, evacuation messaging and direction, and on-site law enforcement control.

Notwithstanding inherent evacuation challenges and uncertainties, the City/County demonstrates a very high effectiveness in managing both mass and targeted evacuations. This assessment is supported by documented evacuation outcomes showing consistently safe and orderly evacuations and is further reinforced by established emergency management protocols, including EFS-16[16]. Technological advancements and improved evacuation strategies learned from prior wildfire evacuation events have resulted in a system that is many times more capable of managing evacuations. With the technology in use today in the County, evacuations are more strategic and surgical than in the past, evacuating smaller areas at highest risk and phasing evacuation traffic so that it flows more evenly and minimizes the surges that may slow an evacuation. Mass evacuation scenarios where large populations are all directed to leave simultaneously, resulting in traffic delays, are thereby avoided, and those populations most at risk populations are able to safely evacuate.

Project would also provide emergency managers the alternative option of recommending the Project's employee/visitors to temporarily seek refuge on-site in fire-resistant buildings[17], temporary refuge areas, or within the wide, converted landscapes and hardscapes that would not readily facilitate wildfire spread. This would provide emergency managers with a safer alternative to risking a late evacuation. By contrast, the examples of Southern California evacuations that have included loss of life have been the result of evacuees who did not evacuate when directed, and then attempted a late evacuation with travel through long distances of exposed travel ways as wildfire was overtaking the

[15] https://abc7.com/sylmar-brush-fire-creek-kagel-canyon/2740550/

[16] Both the Wolf Fire After Action Report (AAR) (https://www.rvcfire.org/incidents/fact-sheets/Wolf_June2025) and the Rosa Fire AAR (https://www.rvcfire.org/incidents/fact-sheets/Rosa-08-2025) indicate that there were zero fatalities associated with these incidents. These fires represent the most recent wildfires in the 2025 calendar year for which AARs are currently available in Riverside County. In addition, a review of CAL FIRE incident statistics and available news coverage does not identify any wildfire-related fatalities in Riverside County for 2025, including across the 58 wildfires that occurred within the County during that year.

[17] The Project buildings are anticipated to be designed as ignition-resistant in accordance with Chapter 5 of the California Wildland–Urban Interface Code (CWUIC) and are expected to utilize concrete tilt-up construction. Concrete construction is inherently noncombustible and typically provides up to a four-hour fire-resistance rating, which generally affords greater fire resistance than Type V residential construction, which is not rated.

area. These examples occurred in fire environments that were more aggressive and included less maintenance than would occur at the Project area.[18]

The information presented here will be provided to emergency managers for use in pre-planning scenarios to better inform the field decisions made pursuant to adopted Emergency Operations Plans. Emergency personnel who issue an evacuation order may take into account these time estimates in determining when and where to issue evacuation orders. In a real evacuation scenario, emergency managers may use alternative actions/options to further expedite evacuation. Such actions may include providing additional lead time in issuing evacuation orders, providing alternative signal control at downstream intersections, utilizing additional off-site routes or directing traffic to roadways with additional capacity, implementing contra-flow lanes, or considering the possibility of a delayed evacuation where parts of the population could be directed to remain on-site until the fire burns out in the sparse fuels around the evacuation route. These options require "in the field" determinations of when evacuations are needed and how they are phased to maximize efficiency. Overall, safe evacuation of Project and the surrounding community is possible under all modeled scenarios.

Limitations

In coordination with fire professionals at Dudek, CRA has presented here a conservative analysis simulating evacuation during an extreme wildfire event. As previously noted, the analysis presents the total time to complete evacuation of all evacuees under the various scenarios, and not the average travel time for a single evacuee.

However, as discussed above, wildfires are variable events. The underlying planning principle for fire preparedness, given the dynamic nature of a fire, is to demonstrate the availability of multiple route alternatives and response strategies to permit emergency professionals to manage their response according to the specific circumstances. The Project area provides route and response alternatives too numerous to be considered in this model. Emergency responders will coordinate the safest possible evacuation based on the dynamic circumstances of the actual event, including the appropriate phasing of the evacuation, and utilization of the most appropriate ingress and egress routes for area evacuees and emergency responders.

The scope of route alternatives and response strategies available to emergency professionals to manage a potential fire in the City/County cannot be and should not be evaluated using this evacuation analysis alone. However, a more comprehensive view of Project's fire safety is gained by understanding this memorandum, the Fire Protection Plan, the Wildland Fire Evacuation Program, and the standard protocols and "in-the-field" decision making of emergency responders as detailed in the City/County Emergency Operations Plan.

The travel time analysis presented here calculated a reasonable vehicle travel time estimate based on professional judgment made by CRA, Dudek, and fire operations experts with experience participating in evacuations in Southern California.

The net result of changing the variables selected could yield an average evacuation travel time shorter or longer than the results detailed in the analysis. Many factors can shorten or lengthen the vehicle time from the results shown herein. For example:

[18] San Diego County Sheriff's Department, Captain Dave Brown during public testimony for the Harmony Grove Village South, Newland Sierra, Otay Ranch Villages 13 and 14 projects – various dates from 2017 to 2019.

1. Changing the possible evacuation routes selected would affect the results. For instance, utilizing roads for ingress and/or egress that are not utilized in this analysis could shorten or lengthen vehicle travel times relative to the results shown herein.

2. Increasing or decreasing the number of path permutations and percentage of the population utilizing each route that leads out of the immediate area could shorten or lengthen vehicle travel time relative to the results shown herein.

3. Emergency professionals electing to reserve certain travel lanes for emergency vehicle ingress for periods of time could affect the travel time relative to the results shown herein.

4. Assuming evacuees utilize fewer or more vehicles to evacuate from their homes relative to the vehicle utilization rate selected in the analysis would shorten or lengthen vehicle travel time relative to the results shown herein.

5. Changing the mix of vehicle trips allocated to each evacuation route could shorten or lengthen vehicle travel time relative to the results shown herein.

6. Assuming different road condition adjustment factors could shorten or lengthen the vehicle travel time relative to the results shown herein.

7. Assuming fewer people are at home or at work when the evacuation notice is given would reduce the number of vehicle trips and shorten vehicle travel time relative to the results shown herein. For instance, an evacuation during daytime hours could result in fewer outbound trips from the surrounding residential neighborhoods than assumed in this analysis

8. Assuming some portion of vehicle trips are made in advance of the evacuation notice would reduce the number of vehicle trips relative to the results shown herein.

9. Assuming emergency professionals elect to implement contraflow on certain roadways to open up additional lanes for emergency evacuation egress could reduce the travel time results shown herein.

10. The availability of new information, unexpected weather conditions, and other unforeseen factors such as changes in fuel loads or shifting weather patterns may influence fire behavior and evacuation outcomes in ways not anticipated at the time of this analysis.

The analysis and conclusions presented in this technical memorandum represent the best professional judgment of the author based on the current state of evacuation and fire science at the time of this report. It is important to note that as climate change progresses, new wildfire events occur, firefighting technologies advance, and after-action reports are produced, the understanding of wildfire behavior and best evacuation practices will continue to evolve. Therefore, practitioners should always consult the most current guidelines, scientific literature, and agency recommendations when planning for wildfire evacuations. The findings and recommendations in this report are intended to provide a snapshot in time and should not be considered a static or exhaustive source. Continued diligence and adaptation to emerging knowledge and practices are strongly recommended.

This evacuation time analysis is necessarily limited in scope given the numerous variables inherent in a wildfire and evacuation event. However, as discussed above, it is not anticipated that Project will significantly impact the time it takes to conduct an evacuation of the Project site or existing surrounding communities based on the evacuation times calculated here and other qualitative considerations.

Prepared by

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Senior Transportation Engineer
CR Associates

Attachment A
Evacuating Vehicles Calculation and Other Supporting Information

Vehicle Ownership obtained from
https://www.beaumontca.gov/DocumentCenter/View/37216/Community-Demographic-Profile

Community • Demographic Profile

Beaumont, California

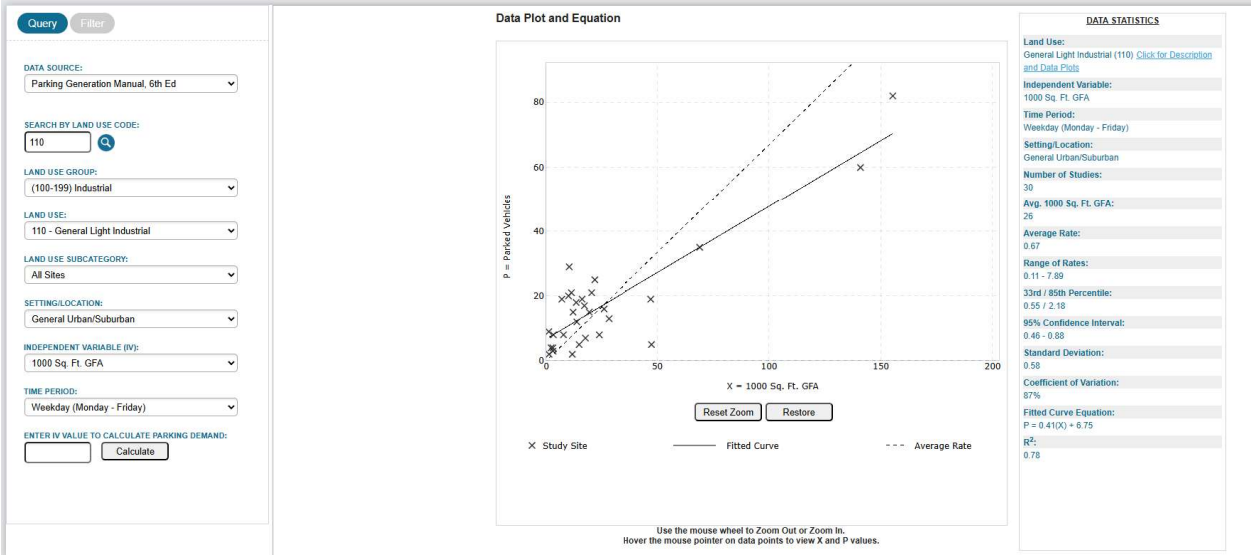
DESCRIPTION	DATA	%
2021 Est. Households by Presence of People Under 18	**15,605**	
Households with 1 or More People under Age 18:	6,565	42.07%
Married-Couple Family	4,711	71.76%
Other Family, Male Householder	613	9.34%
Other Family, Female Householder	1,190	18.13%
Nonfamily, Male Householder	35	0.53%
Nonfamily, Female Householder	16	0.24%
Households with No People under Age 18:	**9,040**	**57.93%**
Married-Couple Family	4,718	52.19%
Other Family, Male Householder	264	2.92%
Other Family, Female Householder	589	6.52%
Nonfamily, Male Householder	1,526	16.88%
Nonfamily, Female Householder	1,943	21.49%
2021 Est. Households by Number of Vehicles	**15,605**	
No Vehicles	304	1.95%
1 Vehicle	3,860	24.74%
2 Vehicles	6,431	41.21%
3 Vehicles	3,271	20.96%
4 Vehicles	1,087	6.97%
5 or more Vehicles	652	4.18%
2021 Est. Average Number of Vehicles		2.2
Family Households		
2026 Projection	12,814	
2021 Estimate	12,082	
2010 Census	9,328	
2000 Census	3,349	
Growth 2021 - 2026		6.06%
Growth 2010 - 2021		29.52%
Growth 2000 - 2010		178.53%
2021 Est. Families by Poverty Status	**12,082**	
2021 Families at or Above Poverty	11,276	93.33%
2021 Families at or Above Poverty with Children	5,559	46.01%
2021 Families Below Poverty	806	6.67%
2021 Families Below Poverty with Children	483	4.00%
2021 Est. Pop 16+ by Employment Status	**39,498**	
Civilian Labor Force, Employed	22,344	56.57%
Civilian Labor Force, Unemployed	1,122	2.84%
Armed Forces	47	0.12%
Not in Labor Force	15,985	40.47%

DESCRIPTION	DATA	%
2021 Est. Civ. Employed Pop 16+ by Class of Worker	**22,344**	
For-Profit Private Workers	15,044	67.33%
Non-Profit Private Workers	1,294	5.79%
Local Government Workers	445	1.99%
State Government Workers	1,014	4.54%
Federal Government Workers	2,847	12.74%
Self-Employed Workers	1,674	7.49%
Unpaid Family Workers	29	0.13%
2021 Est. Civ. Employed Pop 16+ by Occupation	**22,344**	
Architect/Engineer	203	0.91%
Arts/Entertainment/Sports	147	0.66%
Building Grounds Maintenance	543	2.43%
Business/Financial Operations	679	3.04%
Community/Social Services	369	1.65%
Computer/Mathematical	407	1.82%
Construction/Extraction	1258	5.63%
Education/Training/Library	1580	7.07%
Farming/Fishing/Forestry	80	0.36%
Food Prep/Serving	1296	5.80%
Health Practitioner/Technician	2109	9.44%
Healthcare Support	990	4.43%
Maintenance Repair	809	3.62%
Legal	188	0.84%
Life/Physical/Social Science	145	0.65%
Management	1665	7.45%
Office/Admin. Support	2914	13.04%
Production	1090	4.88%
Protective Services	753	3.37%
Sales/Related	2232	9.99%
Personal Care/Service	809	3.62%
Transportation/Moving	2078	9.30%
2021 Est. Pop 16+ by Occupation Classification	**22,344**	
White Collar	12,640	56.57%
Blue Collar	5,233	23.42%
Service and Farm	4,471	20.01%
2021 Est. Workers Age 16+ by Transp. to Work	**22,344**	
Drove Alone	18,172	81.33%
Car Pooled	2,397	10.73%
Public Transportation	210	0.94%
Walked	235	1.05%
Bicycle	16	0.07%
Other Means	302	1.35%
Worked at Home	1,012	4.53%

ITE Parking Rate

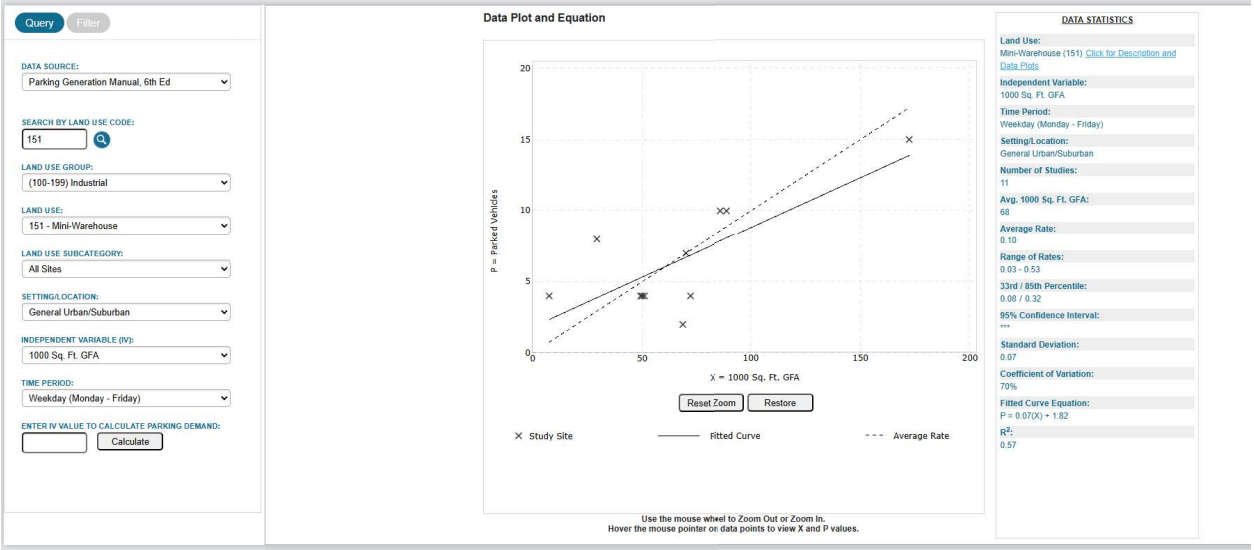
ITEParkGen Web App

Graph Look Up



ITEParkGen Web App

Graph Look Up



ITEParkGen Web App

Graph Look Up

Query | Filter

DATA SOURCE: Parking Generation Manual, 6th Ed

SEARCH BY LAND USE CODE: 932

LAND USE GROUP: (900-999) Services

LAND USE: 932 - High-Turnover (Sit Down) Restaurant

LAND USE SUBCATEGORY: Does Not Serve Breakfast

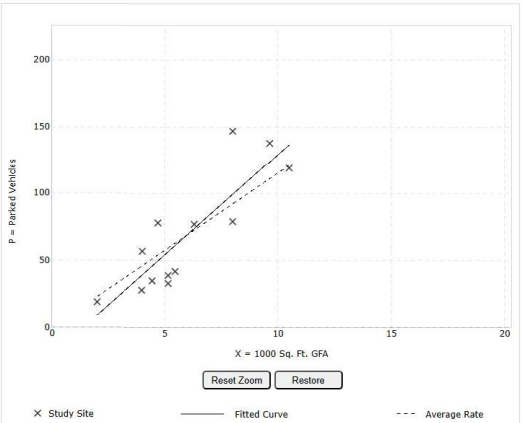
SETTING/LOCATION: General Urban/Suburban

INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

TIME PERIOD: Saturday

ENTER IV VALUE TO CALCULATE PARKING DEMAND: Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and P values.

DATA STATISTICS

Land Use: High-Turnover (Sit Down) Restaurant - Does Not Serve Breakfast (932) Click for Description and Data Plots

Independent Variable: 1000 Sq. Ft. GFA

Time Period: Saturday

Setting/Location: General Urban/Suburban

Number of Studies: 13

Avg. 1000 Sq. Ft. GFA: 6.0

Average Rate: 11.53

Range of Rates: 6.41 - 18.38

33rd / 85th Percentile: 7.80 / 16.37

95% Confidence Interval: ***

Standard Deviation: 3.87

Coefficient of Variation: 34%

Fitted Curve Equation: P = 15.02(X) - 20.77

R^2: 0.73

ITEParkGen Web App

Graph Look Up

Query | Filter

DATA SOURCE: Parking Generation Manual, 6th Ed

SEARCH BY LAND USE CODE: 560

LAND USE GROUP: (500-599) Institutional

LAND USE: 560 - Church

LAND USE SUBCATEGORY: All Sites

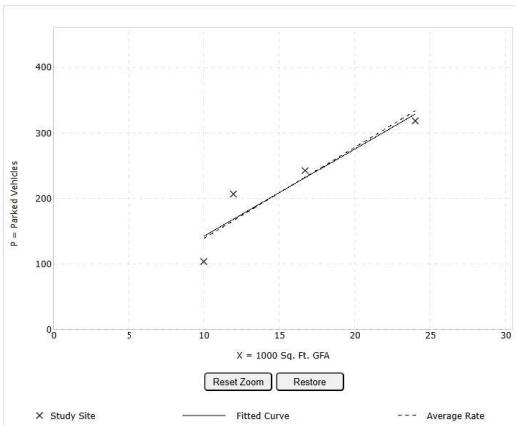
SETTING/LOCATION: General Urban/Suburban

INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

TIME PERIOD: Sunday

ENTER IV VALUE TO CALCULATE PARKING DEMAND: Calculate

Data Plot and Equation *Caution – Small Sample Size*



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and P values.

DATA STATISTICS

Land Use: Church (560) Click for Description and Data Plots

Independent Variable: 1000 Sq. Ft. GFA

Time Period: Sunday

Setting/Location: General Urban/Suburban

Number of Studies: 4

Avg. 1000 Sq. Ft. GFA: 16

Average Rate: 13.94

Range of Rates: 10.42 - 17.32

33rd / 85th Percentile: 12.29 / 17.32

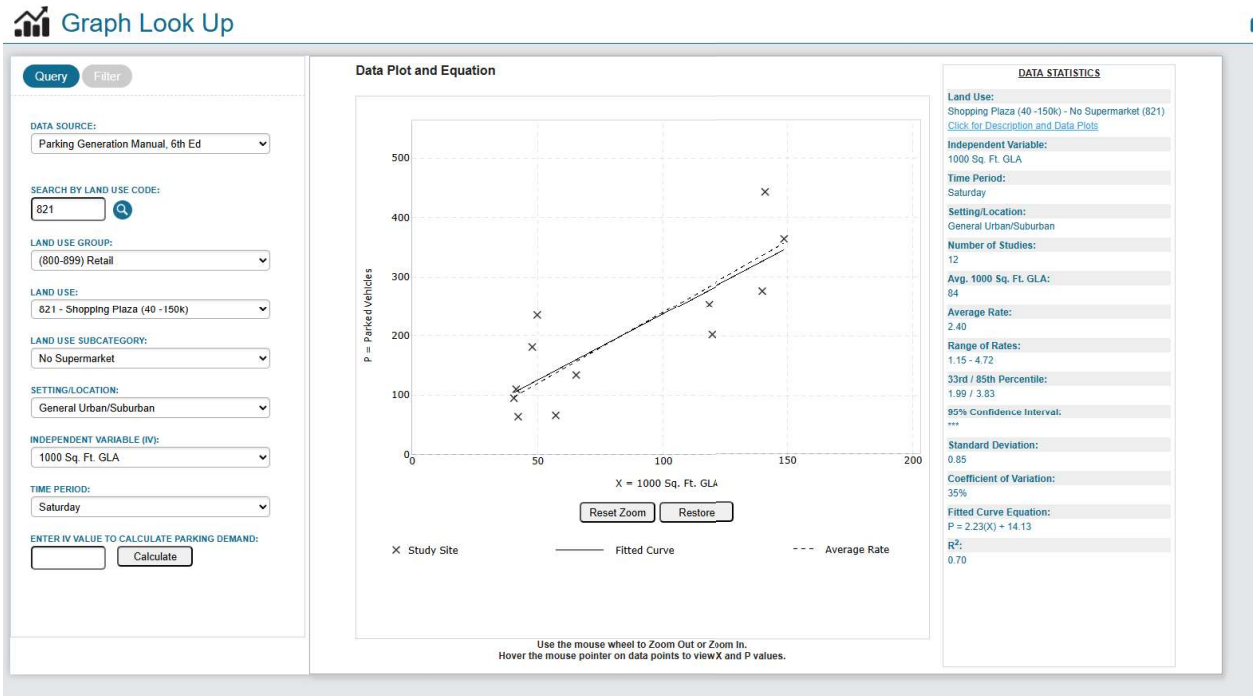
95% Confidence Interval: ***

Standard Deviation: 2.43

Coefficient of Variation: 17%

Fitted Curve Equation: P = 13.34(X) + 9.29

R^2: 0.87



Genasysi Evac Zones vs. Evacuation Zones

	Evacuation Zone							
Genasys Zone	A	B	C	D	E	F	G	Project
	BMT-0516	BMT-0514	RVC-0643	RVC-0643	RVC-0642	BMT-0511	BMT-0509	RVC-0643
	BMT-0517	BMT-0515		BMT-0827	BMT-0511		RVC-0642	
		BMT-0517					BMT-0511	
		BMT-0520						
		BMT-0645						
		RVC-0643						
		BMT-0646						
		BMT-0644						

Evacuating Vehicles Calculation by Zone by Scenario

Scenario	Area	Land Use	Amount	Rate	Rate Source	Total Vehicles	Traffic Study Passenger ADT	Traffic Study Truck ADT	Total	Total Parked Passenger Vehicle	Total Parked Truck Vehicle	Percent Passenger	Percent Truck	Passenger Car Input	Truck Input
Existing	A	Residential	17	2.2	City of Beaumont	38						98%	2%	37	1
Existing	A	Light-Industrial (1,000 square feet)	419	0.67	ITE Parking Generation	281						94%	6%	264	17
Existing	A	Self Storage (1,000 square feet)	113	0.1	ITE Parking Generation	12						98%	2%	12	0
Existing	A	Restaurant (1,000 square feet)	26	11.53	ITE Parking Generation	300						98%	2%	294	6
Existing	B	Residential	2938	2.2	City of Beaumont	6464						98%	2%	6335	129
Existing	C	Residential	11	2.2	City of Beaumont	25						98%	2%	25	0
Existing	D	Residential	39	2.2	City of Beaumont	86						98%	2%	84	2
Existing	E	Residential	49	2.2	City of Beaumont	108						98%	2%	106	2
Existing	F	Residential	93	2.2	City of Beaumont	205						98%	2%	201	4
Existing	F	Light-Industrial (1,000 square feet)	378	0.67	ITE Parking Generation	254						94%	6%	239	15
Existing	F	Self Storage (1,000 square feet)	247	0.1	ITE Parking Generation	25						98%	2%	25	0
Existing	F	Church	5	13.94	ITE Parking Generation	70						98%	2%	69	1
Existing	G	Egg Farm (1,000 square feet)	264	0.67	Use Light Industrial Rate - observation show much less	177						94%	6%	166	11
Existing	G	Residential	28	2.2	City of Beaumont	62						98%	2%	61	1
Existing	G	Light-Industrial (1,000 square feet)	3291	0.67	ITE Parking Generation	2205						94%	6%	2073	132
Project	Project	Light-Industrial (1,000 square feet)	688.2	0.67	ITE Parking Generation	462	2696	148	2844	438	2258	95%	5%	438	24
Project	Project	Light-Industrial (1,000 square feet)	1488.6	0.67	ITE Parking Generation	998	8524	462	8986	947	7577	95%	5%	947	51
Project	Project	Light-Industrial (1,000 square feet)	1675.6	0.67	ITE Parking Generation	1123	15084	812	15896	1066	14018	95%	5%	1066	57
Project	Project2	Light-Industrial (1,000 square feet)	1847.6	0.67	ITE Parking Generation	1238	22318	1198	23516	1175	21143	95%	5%	1175	63
Cumulative	A	79 North Logistics (1,000 squarefeet light industrial)	404.2	0.67	ITE Parking Generation	271						94%	6%	255	16
Cumulative	A	Pacific Scene (95 SF Residential)	95	2.2	City of Beaumont	209						98%	2%	205	4
Cumulative	B	Potrero Creek Estates (700 SF Residential	700	2.2	City of Beaumont	1540						98%	2%	1509	31
Cumulative	F	McClure Machine Shop (16,800 squarefeet light industrial	16.82	0.67	ITE Parking Generation	12						94%	6%	11	1
Cumulative	G	Legacy Highland (High Cube Warehouse & Cold Storage) - 20406000 SF total, 20% may shared same route as project	20406	0.39	ITE Parking Generation	1592						94%	6%	1496	96
Cumulative	G	Legacy Highland (Commercial) 143000 SF total, , 20% may shared same route as project	143	2.4		69						98%	2%	68	1
Cumulative	G	Taurek (Single Family Residential)	244	2.2	City of Beaumont	537						98%	2%	526	11
Cumulative	G	Orchard Logistic (High Cube Fulfillment)	610	0.67	ITE Parking Generation	409						94%	6%	384	25

Attachment B
Evacuation Analysis Worksheets

Per the Highway Capacity manual:
"The base capacity values presented in the HCM—for example, 2,400 vehicles per hour per lane on a freeway with a 75-mph free-flow speed, or 1,900 vehicles per hour of green at a traffic signal—are just that: *base values.* These values incorporate, among other factors, ideal roadway geometry, a traffic stream composed entirely of passenger cars, and good weather.

Highway Capacity Manual: A Guide for Multimodal Mobility Analysis

Exhibit 12-4
Basic Freeway and Multilane Highway Segment Capacity Under Base Conditions

FFS (mi/h)	Capacity of Basic Freeway Segments (pc/h/ln)	Capacity of Multilane Highway Segments (pc/h/ln)
75	2,400	NA
70	2,400	2,300[a]
65	2,350	2,300[a]
60	2,300	2,200
55	2,250	2,100
50	NA	2,000
45	NA	1,900

Notes: NA = not available.
[a] Capacities for multilane highways with 65- and 70-mi/h FFS are extrapolated and not based on field data.

The table below presents roadway capacity in five-minute increments, reflecting its significant variations within an hour.

Speed	Capacity per Hour	Capacity per 5 Minutes	Source
25	1500	125	Estimate based on HCM
30	1600	134	Estimate based on HCM
35	1700	142	Estimate based on HCM
40	1800	150	Estimate based on HCM
45	1900	159	HCM Multi-lane Highway
50	2000	167	HCM Multi-lane Highway
55	2100	175	HCM Multi-lane Highway
60	2200	184	HCM Multi-lane Highway
65	2300	192	HCM Multi-lane Highway

The evacuation capacity of each roadway varies due to factors such as speed limits and downstream traffic congestion. As a result, during evacuations, the number of vehicles that can travel per hour per lane is typically lower than during stable flow conditions.

The table below illustrates the number of vehicles passing through various roadway segments in five-minute intervals, as recorded over a two-hour period using the Vissim microsimulation model. The data indicate that the highest observed flows were below the theoretical (HCM) stable flow.

Existing (2024) Conditions

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	5366.235	1766.235	0:29
B		3600	B	59	12236.19	8636.185	2:23
C		3600	C	61	6543.345	2943.345	0:49
D		3600	D	62	6530.885	2930.885	0:48
E		3600	E	63	7737.515	4137.515	1:08
F		3600	F	64	6876.87	3276.87	0:54
G		3600	G	65	9319.23	5719.23	1:35

Background (2030) Conditions

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	6794.765	3194.765	0:53
B		3600	B	59	15520.1	11920.1	3:18
C		3600	C	61	6446.685	2846.685	0:47
D		3600	D	62	6387.63	2787.63	0:46
E		3600	E	63	6497.035	2897.035	0:48
F		3600	F	64	6840.825	3240.825	0:54
G		3600	G	65	16351.63	12751.63	3:32

Background (2030 – Phase 1 through Phase 3) With Project Conditions

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	6804.245	3204.245	0:53
B		3600	B	59	15530.23	11930.23	3:18
C		3600	C	61	6564.14	2964.14	0:49
D		3600	D	62	7714.245	4114.245	1:08
E		3600	E	63	8403.3	4803.3	1:20
F		3600	F	64	7105.41	3505.41	0:58
G		3600	G	65	16568.37	12968.37	3:36
Project		3600	Project	66	17134.53	13534.53	3:45

Cumulative No Project Conditions (2045)

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	7478.715	3878.715	1:04
B		3600	B	59	17356.69	13756.69	3:49
C		3600	C	61	6721.965	3121.965	0:52
D		3600	D	62	6725.315	3125.315	0:52
E		3600	E	63	6892.31	3292.31	0:54
F		3600	F	64	7260.39	3660.39	1:01
G		3600	G	65	18434.53	14834.53	4:07

Cumulative With Project Conditions (2045 – Project Buildout)

Start Zone	Start Gate	Start Time	End Zone	End Gate	End Time	Elapse Seconds	Elapse Time
A		3600	A	60	7464.863	3864.863	1:04
B		3600	B	59	17537.49	13937.49	3:52
C		3600	C	61	6792.437	3192.437	0:53
D		3600	D	62	8582.905	4982.905	1:23
E		3600	E	63	9419.611	5819.611	1:37
F		3600	F	64	7707.205	4107.205	1:08
G		3600	G	65	18677.52	15077.52	4:11
Project		3600	Project	66	19990.74	16390.74	4:33

Reference & Analysis Tool Selection

The methodology for fire evacuation analysis is rapidly advancing as new data and best practices become available. Before conducting the evacuation analysis, a thorough historical review of fire evacuation behavior and practices was undertaken to ensure the analysis accurately reflects local conditions. Consequently, the list of references in the technical memorandum only includes documents that pertain directly to local operating conditions and behaviors. The intention behind this selective referencing is to guide decision-makers towards specific, location-relevant guidelines rather than providing a comprehensive list of all reviewed best practices.

CRA has compiled an extensive list of research and findings on best practices for both wildfire and standard evacuation analyses. These foundational best practices informed our evacuation analysis, and a selection of the most relevant and recent research is included at the end this section. According to the research, wildfire evacuation analysis is not a one-size-fits-all approach; certain tools and practices are better suited for jurisdiction-wide analysis, including transportation modeling, roadway capacity-based analysis, GIS analysis, and custom tools. Notably, "A Review of Traffic Models for Wildland-Urban Interface Wildfire Evacuation" (Bergstedt, 2017) identified 12 tools for evacuation analysis, a number that continues to grow as more data and computing power become available.

Vissim, although not the sole tool available for fire evacuation analysis, was chosen for its capability to simulate driver behaviors, particularly undesirable behaviors such as competing for the right-of-way during evacuations. This capability is endorsed by the Bergstedt research paper and is utilized by various agencies, including the Utah Department of Transportation and the Florida Department of Transportation for hurricane evacuation analysis. Vissim's popularity and widespread use in evacuation analysis are evidenced by its citation in over 700 research papers, reflecting its effectiveness in mirroring human behavior. Despite the availability of other tools, Vissim was deemed the most suitable for this project's evacuation analysis.

The WUI-NITY, while an impressive tool designed for evaluating jurisdiction-wide evacuation, does not fully meet the specific needs of this project. A critical aspect of our analysis is to manage varying traffic flows and dynamic roadway capacities that change due to downstream congestion. The WUI-NITY, which focuses on larger planning areas, relies on a simplified ad hoc traffic movement model that uses common assumptions in evacuation modeling and determines road capacity based on the number of lanes and road type. While this approach is generally acceptable, our study requires a more nuanced method that accounts for local conditions, such as winding roads where actual driving speeds may be lower than posted limits. Therefore, we opted to use Vissim for its finer detail in simulation.

Similarly, the Wildfire Safe Egress – Platform (WISE), developed by the UCLA Engineering Department, employs an approach akin to that of WUI-NITY. However, WISE, being a GIS-based analysis tool, considers varying evacuation patterns and uses GIS analysis to estimate actual evacuation times. Like WUI-NITY, the WISE platform is better suited for broader planning level analysis and does not offer the detailed benefits provided by the Vissim microsimulation platform.

Additionally, the "Traffic Modeling for Wildland–Urban Interface Fire Evacuation" research paper, which evaluated a broad range of potential fire evacuation modeling platforms including microsimulation, supports the methodology used in this project. The paper underscores that microsimulation should be sensitive to local conditions and reflect actual demand. This aligns with our approach: vehicle ownership was derived from census data to mirror local demand accurately, and speed and traffic counts were meticulously gathered from all study area roadways to calibrate the model. The research findings affirm the conclusions of the CRA team regarding the adoption of best practices in evacuation modeling.

Minimum Throughput Time (MTT) and the Role of Microsimulation in Evacuation Analysis

Appendix Q of the 2025 California Fire Code introduces Minimum Throughput Time (MTT) as part of the Community Wildland–Urban Interface (WUI) Fire Hazard Evaluation Framework. MTT is a screening-level, traffic-engineering calculation intended to provide an initial, lower-bound estimate of how long it would take for an assumed number of evacuation vehicles to pass through the most constrained elements of a community's evacuation network. It is based on simplified assumptions regarding roadway capacity, number of evacuation lanes, and nominal travel speeds, and is explicitly described as an idealized measure intended to support early-stage planning and identification of potential bottlenecks

Critically, Appendix Q emphasizes that MTT does not represent actual evacuation conditions. The methodology does not account for signal operations, queue spillback, merging behavior, traffic incidents, smoke-related speed reductions, vehicle mix, phased evacuations, interactions with

neighboring communities, or fire-related roadway disruptions. As such, MTT is best understood as a conceptual benchmark—useful for establishing an order-of-magnitude sense of evacuation feasibility and highlighting where constraints may exist, but insufficient on its own for evaluating real-world evacuation performance or mitigation effectiveness.

Microsimulation evacuation modeling directly aligns with the intent of the MTT framework while addressing its known limitations. Both approaches seek to understand whether evacuation demand can be processed through a constrained roadway system; however, microsimulation does so using dynamic, time-dependent modeling rather than static assumptions. By explicitly representing individual vehicle movements, intersection control, traffic signal timing, lane-changing, merging, and queue formation, microsimulation provides a more realistic depiction of evacuation conditions under stressed, emergency scenarios. Appendix Q itself acknowledges the existence and value of dynamic evacuation modeling as a more advanced analytical approach, reinforcing that microsimulation is a logical extension of the MTT framework

A central insight provided by microsimulation is that roadway capacity during evacuations is variable and context-dependent, not fixed. A roadway segment may have sufficient geometric capacity to carry high volumes of traffic, but if downstream intersections or links are congested, queue spillback can significantly reduce its effective throughput. Conversely, if congestion or phasing upstream limits the number of vehicles entering a corridor, downstream facilities may never reach their theoretical capacity, regardless of design. Microsimulation captures these interactions, demonstrating that evacuation performance is governed by network-wide dynamics rather than a single bottleneck or capacity value.

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