GUIDE TO TITLE 24

Based on the 2019 edition of the California Building Standards Code, Title 24, California Code of Regulations

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4th Edition

CALIFORNIA
BUILDING STANDARDS COMMISSION

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Mia Marvelli, Executive Director

Michael Nearman, Deputy Executive Director

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Chapter 1. Introduction

This guide is developed and distributed by the California Building Standards Commission. The intent is to provide information on the application, use and organization of the California Building Standards Code, Title 24 of the California Code of Regulations (Title 24), which governs the design and construction of all building occupancies and associated facilities and equipment throughout California.

This guidebook will also explain the inclusion of model codes in Title 24, state amendments to model code language, and how to identify and apply adopted provisions for specific building types, occupancies, facilities and equipment. There are examples to illustrate the proper use of code text, and information on enforcement of Title 24 as provided in state law that should be of interest to local government.

Most code illustrations used herein are taken from the 2019 California Building Code (Part 2 of Title 24, Volume 1), and we recommend you have that code in hand while reading this guide. Access to the state websites for California state laws and the California Code of Regulations will also enhance your use of this guide. The website for state laws is California Legislative Information at https://leginfo.legislature.ca.gov/faces/codes. The website for the California Code of Regulations may be accessed through the California Office of Administrative Law at www.oal.ca.gov.

This guide will reference the following documents that are available at the California Building Standards Commission website at www.dgs.ca.gov/bsc.

- All parts of the 2019 edition of Title 24
- Specifically, Chapter 1, Division 1, of the California Building Code (Part 2 of Title 24)

Chapter 7 of this guide provides a glossary of terms commonly associated with Title 24 and the code adoption process. We highly recommend reviewing the glossary before proceeding to Chapter 2 and using the glossary as you read the guide to improve your understanding of the terminology. Without a working understanding of the names and terms used herein to explain Title 24, the effectiveness of this guide will be impaired. A self-evaluation quiz designed to reinforce appropriate understanding of the application and use of Title 24 is provided in Chapter 8.

The information provided in this guide should help eliminate common errors in the application of building codes in California. Common errors include:

- Using model codes instead of Title 24
- Applying model code provisions that are not adopted for use in California

- Applying adopted Title 24 provisions universally that were intended for only specific building occupancies or building features
- Not applying Title 24 provisions that are developed to implement state laws and that are not provided in model codes
- Using Title 24 provisions that have been superseded by provisions published at a later date as supplements to Title 24

For persons learning to use codes, we recommend reading the *Code Book Fundamentals* guide available on CBSC's website www.dgs.ca.gov/bsc. It provides an explanation of important fundamentals about laws, regulations, and codes that will be very helpful. Our educational publications are available under the *Resources* on our website.

Written comments and suggestions regarding this guide are welcomed so that future editions will be more effective. Address written comments and suggestions to:

Mia Marvelli, Executive Director
California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833

Comments and suggestions may also be sent by email to cbsc@dgs.ca.gov.

Chapter 2. Introduction to Title 24

If you are unfamiliar with some of the terms used in this guide, see the Glossary of Terms in Chapter 7 for definitions including:

- California Code of Regulations
- California Health and Safety Code
- California Building Standards Commission

Getting to Know Title 24

The California Building Standards Code, Title 24, is the 24th title within the California Code of Regulations (CCR). The CCR is divided into 28 separate titles, each based on subjects or state agency jurisdictions. State regulations in the CCR are developed by state agencies as determined necessary to implement, interpret, clarify and carry out the requirements of state law. The state agencies must have authority in state law to adopt or propose regulations. State regulations should not be confused with state laws enacted through the legislative process.

Title 24 is reserved for state regulations that govern the design and construction of buildings, associated facilities and equipment. These regulations are defined as building standards in California Health and Safety Code (HSC) Section 18909. HSC Section 18902 gives Title 24 the name California Building Standards Code.

Title 24 is published by the California Building Standards Commission (CBSC) and it applies to all building occupancies throughout the State of California (see HSC Sections 18908 and 18938). A common misunderstanding is that Title 24 relates to only energy conservation, or only accessibility, or that it applies to only state owned buildings and properties. In fact, Title 24 applies to all building occupancies, and related features and equipment, throughout the state. It contains requirements for structural, mechanical, electrical, and plumbing systems, and requires measures for energy conservation, sustainable design, construction and maintenance, fire and life safety, and accessibility.

Cities and counties are required by state law to enforce Title 24 (more about this in Chapter 6. Enforcement). Cities, counties, a city and county, and fire protection districts, may adopt ordinances making more restrictive requirements than provided by Title 24 because of local climatic, geological, or topographical conditions. Chapter 5 provides details about how local amendments may be established lawfully. Additionally, our *Guide for Local Amendments of Building Standards,* available on our website, explains these requirements.

The Commission

CBSC is responsible for overseeing the adoption, approval and publication of the provisions in Title 24. CBSC has 10 members appointed by the governor who must be confirmed by the state senate. A voting chairperson, who is the Secretary of the Government Operations Agency, is also appointed by the governor and confirmed by the state senate. The authority and activities of CBSC are set out in Health and Safety Code (HSC), Division 13, Part 2.5, commencing with Section 18901. This portion of the HSC is known as the California Building Standards Law. The HSC requires that members of CBSC be representative of the general public and regulated industry. Excluding the chairperson, the appointed membership of CBSC must include:

One Architect
One Mechanical, Electrical or Fire Protection Engineer
One Structural Engineer
One Licensed Contractor
One Representative from Organized Labor in the building trades
One Local Building Official
One Local Fire Official
Three Representatives of the General Public, of which at least one shall be a person with physical disabilities

Additional requirements are:

1. At least one member shall be experienced and knowledgeable in barrier free architecture and sensitive to the requirements necessary to ensure public buildings are accessible to, and usable by, persons with physical disabilities.
2. At least one member of the commission shall be experienced and knowledgeable in building energy efficiency standards.
3. At least one member of the commission shall be experienced and knowledgeable in sustainable building, design, construction and operation.

The term length for each member is four years and termination dates are staggered. The chairperson, who is the Secretary of the Government Operations Agency, serves at the pleasure of the governor.

CBSC is supported by a staff of 14 state employees guided by an Executive Director appointed by CBSC's commissioners. CBSC oversees a Coordinating Council of state agency representatives, and Code Advisory Committees consisting of volunteers. CBSC also has authority in state law to propose for adoption building standards with application to state owned buildings, green building standards for non-residential buildings, and for any building type where no other state agency has specific authority to do so, or when a state agency with authority to adopt fails to do so because of budget or other constraints.

How Title 24 Is Organized

The provisions of Title 24 include requirements for the structural, plumbing, electrical and mechanical systems of buildings, and for fire and life safety, energy conservation, green design and accessibility in and about buildings. Thus, Title 24 is organized into separate parts. Each part is given a separate name reflecting its subject. Some parts are based on model codes (explained later in the guide). The current edition of Title 24 includes:

- Part 1 – California Administrative Code
- Part 2 – California Building Code, Volumes 1 and 2, based on the 2018 International Building Code
- Part 2.5 – California Residential Code, based on the 2018 International Residential Code
- Part 3 – California Electrical Code, based on the 2017 National Electrical Code
- Part 4 – California Mechanical Code, based on the 2018 Uniform Mechanical Code
- Part 5 – California Plumbing Code, based on the 2018 Uniform Plumbing Code
- Part 6 – California Energy Code
- Part 7 – currently vacant
- Part 8 – California Historical Building Code
- Part 9 – California Fire Code, based on the 2018 International Fire Code
- Part 10 – California Existing Building Code, based on the 2018 International Existing Building Code
- Part 11 – California Green Building Standards Code, also known as the CALGreen Code
- Part 12 – California Referenced Standards Code

This picture shows the 2019 edition of Title 24, Parts 1 through 12, in eleven binders.

Each binder contains one part with the exceptions of Part 2, which has two binders for Volume 1 and Volume 2, and Part 8 (California Historical Building Code), Part 10 (California Existing Building Code) and Part 12 (California Referenced Standards Code), which are combined in one binder featuring Part 10 on the cover. Part 7 is vacant and there is no binder, nor is it located in any other Part of Title 24.

Code Names: Let's Clarify the Confusion

Code names can be confusing so, before going further, let's clarify three names that have already been mentioned and that can create confusion if not understood correctly.

- **California Building Standards Law**: This name refers to the body of state law within California Health and Safety Code (HSC), Division 13, Part 2.5, commencing with Section 18901. The provisions of Part 2.5 govern the work of CBSC, and specify that the codes adopted and published by CBSC have statewide application. The provisions of Part 2.5 are state laws enacted through the legislative process involving the state legislature and governor. See HSC Section 18901.

- **California Building Standards Code**: This name refers to the building standards located in Title 24 of the CCR as published by the California Building Standards Commission. The building standards in the California Building Standards Code are state regulations developed or adopted by various state agencies in the executive branch of state government. State laws require various state agencies to develop building standards for specific types of buildings, building equipment and features. See HSC Section 18902.

- **California Building Code**: This name refers to Part 2, Volumes 1 and 2, of the California Building Standards Code in Title 24 of the CCR. It should not be confused with the California Building Standards Code, which is the name given to the entire body of building standards in Title 24. Again, the California Building Code is only Part 2, Volumes 1 and 2, within Title 24 of the California Building Standards Code.

Model Codes Incorporated in Title 24

As previously stated in *How Title 24 is Organized*, several parts of Title 24 are based on model codes. The term "model code" means a code that has been developed by a private code developing organization and that is available through a license agreement with the publishing entity for adoption by a political jurisdiction. Health and Safety Code (HSC) Section 18916, which is within the California Building Standards Law, reads as follows:

> *"Model code" means any building code drafted by private organizations or otherwise, and shall include, but not be limited to, the latest edition of the following: (a) The International Building Code of the International Code Council.*

(b) The Uniform Plumbing Code of the International Association of Plumbing and Mechanical Officials.
(c) The Uniform Mechanical Code of the International Association of Plumbing and Mechanical Officials.
(d) The National Electrical Code of the National Fire Protection Association.
(e) The International Fire Code of the International Code Council.
(f) The International Existing Building Code of the International Code Council.
(g) The International Residential Code of the International Code Council.

When a new model code edition becomes available, CBSC and the specified state agencies must review the code to determine if adoption is appropriate. Not all available model codes are found to be appropriate for use in California. Those currently adopted are shown in *How Title 24 Is Organized*.

Exceptions and clarifications:

In some cases, not all chapters of the model code used as the basis for a part of Title 24 are adopted:

1. The California Building Code (Part 2 of Title 24) is based predominantly on the International Building Code. However, Chapters 7A and 11A are California Amendments in their entirety. Chapter 7A is developed by the Office of the State Fire Marshal (SFM) to implement state law regarding wildland fire hazards. Chapter 11A is developed by the Department of Housing and Community Development (HCD) for accessibility in multifamily dwellings and the Division of the State Architect (DSA) for accessibility in public housing.
2. Chapter 11B of Part 2 is developed by DSA to implement state law regarding accessibility for persons with disabilities to public buildings, public accommodations, commercial buildings and public housing. The “model code” used by DSA for the provisions in Chapter 11B is the 2010 Americans with Disabilities Act Standards for Accessible Design as adopted by the U.S. Department of Justice. DSA additionally revises the model code language with California Amendments, which are identified by the use of italics.

Why Model Codes Are Amended by the State

Those parts of Title 24 that are based on a model code incorporate the model code language along with California Amendments. CBSC and other state agencies have determined that California Amendments are necessary to:

- eliminate conflict with state laws,
- include requirements of state laws, or
- eliminate conflicts with other adopted model codes.

All proposed California Amendments are made available for public review when a code adoption is proposed. Proposed model code text and amendments are subject to discussion during public meetings held by CBSC. Public meeting announcements are available on the CBSC website.

You Can't Just Use the Model Code

The model codes as published by their originators do not include the California Amendments. Further, not all model code provisions are adopted in California because of conflicts with state laws or the lack of specificity required by state law. You must use Title 24 as currently published by CBSC to know and apply California Amendments and model code provisions that are adopted.

For example, the energy conservation, mechanical, fuel gas, plumbing and electrical provisions of the International Residential Code (IRC) that is used as the basis for the California Residential Code (Part 2.5 of Title 24) are not printed in Part 2.5 and are not adopted for use in California. Other provisions of the IRC are adopted for such applications in one- and two-family dwellings in California (see Chapter 1, Division 1 of the California Residential Code for application details).

How Amendments Are Shown

California amendments to a model code are illustrated within Title 24 by *italic font print*. In each part of Title 24 based on a model code there is an explanation of the California Amendments provided near the front of the book. See page v in the 2019 California Building Code and the example shown in *How to Use Title 24* later in this guide.

Amendments Versus California Standards

As already discussed, a California Amendment is an amendment to a model code used as the basis for a part of Title 24. Parts 2, 2.5, 3, 4, 5, 9 and 10 are based on model codes. California amendments to the model codes are identified by *italic font print* within the code text. Parts 1, 6, 8, 11 and 12 are not based on model codes. The contents of these parts are developed by the state agencies and are commonly referred to as being California Standards. Therefore, in Parts 1, 6, 8, 11 and 12, standard non-italic font print is used throughout.

Matrix Adoption Tables

The Matrix Adoption Tables within Title 24 identify adopted model code text, and California Amendments and Standards. Matrix Adoption Tables are provided in Parts

2, 2.5, 3, 4, 5, 9,10 and 11, at the beginning of each chapter (or article) to identify the model code and/or California Amendment or Standard adoptions by each of the state agencies. A Matrix Adoption Table is only provided for adopted model code chapters, with the exception of Part 11 (details below). Thus, if there is no table for a model code chapter, the chapter has not been adopted for application to a building subject to the state agency jurisdiction.

> **Exception:** Occasionally the code publisher has provided a blank Matrix Adoption Table at the beginning of a model code chapter that is not adopted. Accordingly, if a Matrix Adoption Table is provided for a model code chapter but is blank (showing no "Xs" for adoptions), then the chapter is not adopted by a state agency. Clarifying notes are sometimes provided for a blank Matrix Adoption Table.

Many model code sections and California Amendments and Standards are only adopted by specific state agencies and thus only apply to specific types of buildings, occupancies, building features or equipment. Each Matrix Adoption Table lists all the adopted sections. Not all adopted code provisions are applicable to all buildings. There is also a Matrix Adoption Table for those chapters in Title 24 that are California Amendments or Standards in their entirety, such as Chapters 7A and 11A.

The California Green Building Standards Code (CALGreen), Part 11 of Title 24, is not based on a model code but has Matrix Adoption Tables. The Matrix Adoption Tables were deemed necessary to show the adoptions applicable to the various building types.

In the 2010, 2013 and 2016 editions of Title 24 the Matrix Adoption Tables were located at the beginning of each adopted chapter, article, or division within a chapter. This practice is continued in the 2019 edition of Title 24. In editions prior to the 2010 edition of Title 24, the Matrix Adoption Tables were grouped together near the beginning of each part based on a model code. The use and application of the Matrix Adoption Tables is discussed with illustrations in Chapter 3 of this guide.

Other CCR Regulations

There are other titles within the California Code of Regulations (CCR) with subjects that relate to buildings:

- Title 8, Division 1, Chapter 4, Subchapter 6 for elevator construction requirements
- Title 17 with adoptions by the State Water Resources Control Board
- Title 19 with adoptions by the Office of the State Fire Marshal
- Title 20 with adoptions by the California Energy Commission
- Title 21 with adoptions by the Division of the State Architect

- Title 22 with adoptions by the State Water Resources Control Board
- Title 25 with adoptions by the Department of Housing and Community Development for dwellings, and permanent buildings in mobilehome and special occupancy parks. See Title 25, Division 1, Chapter 1, Subchapter 1 and Chapters 2 and 2.2

These titles are available online at the website of the California Office of Administrative Law at www.oal.ca.gov. This website also provides helpful information about the CCR.

The State Agencies

The state agencies involved in the development and adoption of building standards for publication in Title 24 are identified in the California Building Standards Law within Health and Safety Code (HSC), Division 13, Part 2.5, as state adopting agencies or state proposing agencies.

The state proposing agencies have authority to develop and propose building standards to CBSC. CBSC conducts the public comment periods and public meetings, and adopts the proposed building standards. The state proposing agencies are:

- California Building Standards Commission (CBSC or BSC when proposing regulations for Title 24)
- Department of Housing and Community Development (HCD)
- Division of the State Architect (DSA)
- Office of the State Fire Marshal (SFM)
- Office of Statewide Health Planning and Development (OSHPD)
- Department of Consumer Affairs (DCA), and various boards and bureaus therein
- California Department of Public Health (CDPH)

A state adopting agency has authority to develop and conduct its own public reviews and hearings, and to adopt its proposed building standards. Its adoptions must be submitted to CBSC for approval and publication in Title 24. CBSC's authority to approve adoptions by state adopting agencies is limited to verifying that the adoption process was carried out in compliance with the requirements of state law. The state adopting agencies are:

- California Energy Commission (CEC)
- State Historical Building Safety Board (SHBSB)
- Board of State and Community Corrections (BSCC)
- Department of Food and Agriculture (DFA)
- State Library (SL)
- State Lands Commission (SLC)
- Department of Water Resources (DWR)

In this *Guide to Title 24*, we will disregard the technical differences between the state adopting and state proposing agencies. We will refer to only state agencies. In some explanations of the use of Title 24, it may be indicated that a state agency has adopted a code provision when in fact the CBSC commissioners have performed the act of adoption. A complete list of all state agencies and their respective code adoption jurisdiction is provided in Chapter 3 of this guide.

City and County Adoption of Title 24

CBSC has developed a guide for local government relating to adoption of Title 24 and amendments thereto; the *Guide for Local Amendments of Building Standards* is available on CBSC's website. This guide provides information developed specifically for local government about the local adoption process and provides references to applicable provisions of the Health and Safety Code. Amendments by fire protection districts are also explained.

Our Education and Outreach webpage hosts a link to a YouTube webinar about local adoptions and amendments. If further assistance is needed, contact us at cbsc@dgs.ca.gov. More information about local adoptions is provided in Chapter 5 of this guide.

Chapter 3. How to Use Title 24

It is important that you have read and understand Chapters 1 and 2 of this guide before proceeding. We will repeat some information in this chapter for clarity.

In order to use Title 24 correctly, the reader must understand the following:

- Title 24 published format
- Use of state agency acronyms or abbreviations
- Code adoption jurisdiction of each state agency
- Use of Matrix Adoption Tables

Title 24 Format

Parts 2, 2.5, 3, 4, 5, 9 and 10 of Title 24 are based on the selected model codes mentioned previously. These parts contain adopted model code language and California Amendments authored by several state agencies such as the California Building Standards Commission (CBSC), the Department of Housing and Community Development (HCD), the Division of the State Architect (DSA), the State Fire Marshal (SFM), the Office of Statewide Health Planning and Development (OSHPD) and others listed in Chapter 3 of this guide.

In the published parts of Title 24 that are based on a model code, model code language is shown in standard font print and California Amendments are shown in *italic font print*. Below is a reprint of a portion of Section 1404 from the 2019 California Building Code with multiple California Amendments by the HCD, DSA and OSHPD. The acronyms identifying state agencies within the code text will be explained later in the guide.

SECTION 1404
INSTALLATION OF WALL COVERINGS

1404.1 General. Exterior wall coverings shall be designed and constructed in accordance with the applicable provisions of this section.

1404.1.1 Additional requirements. [DSA-SS & DSA-SS/CC, OSHPD 1, 1R, 2, 4 & 5] *In addition to the requirements of Sections 1404.6, 1404.7, 1404.8, 1404.9, and 1404.10, the installation of anchored or adhered veneer shall comply with applicable provisions of Section 1410.*

1404.2 Weather protection. Exterior walls shall provide weather protection for the building. The materials of the minimum nominal thickness specified in Table 1404.2 shall be acceptable as approved weather coverings.

1404.3 Vapor retarders. Vapor retarders as described in Section 1404.3.3 shall be provided in accordance with Sections 1404.3.1 and 1404.3.2, or an approved design using accepted engineering practice for hygrothermal analysis.

1404.3.1 Class I and II vapor retarders. Class I and II vapor retarders shall not be provided on the interior side of frame walls in Zones 1 and 2. Class I vapor retarders shall not be provided on the

interior side of frame walls in Zones 3 and 4. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with the *California Energy Code*.

[HCD 1 & HCD 2] *Class I or II vapor retarders shall be provided on the interior side of frame walls of low-rise residential buildings in Climate Zones 14 and 16, as required in the California Energy Code (see definition of "Low-rise residential building").*

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.
4. Conditions where Class III vapor retarders are required in Section 1404.3.2.

1404.3.2 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 1404.3.2 is met. Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the exterior side of the frame wall.

[HCD 1 & HCD 2] *Class III vapor retarders shall be permitted where any one of the conditions in Items 1, 2 or 3 below are met. This section shall apply to "Low-rise residential buildings" as defined in the California Energy Code.*

1. *Vented cladding over fiberboard*
2. *Vented cladding over gypsum*
3. *Insulated sheathing with R-value ε R4*

Spray foam with a minimum density of 2 lbs/ft³ applied to the interior cavity side of OSB, plywood, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam R-value meets or exceeds the specified insulating sheathing R-value.

Users of this section of the code will note:

- Subsections 1404.1 and 1404.2 are examples of model code text in standard font print.
- Subsection 1404.1.1 is a California Amendment by DSA and OSHPD as identified by the *italic font print*. This code amendment will be found **only** in the published California Building Code, Part 2 of Title 24, and not in the model code.
- Subsection 1404.3.1 has a California Amendment within the model code text by HCD as shown by the italic font print and the acronyms HCD-1 and HCD-2.

Exceptions and clarifications:

1. Unfortunately, there are a few exceptions to the use of *italic font print*. Some model codes also use *italic font* for special notes and identifiers. The way to be certain that code text printed in *italic font* is actually a California Amendment will be explained in the section about the Matrix Adoption Tables.
2. Parts 1, 6, 8, 11 and 12 are developed entirely by state agencies as California Standards. These parts are not based on model codes. The text of these parts

is printed in standard font, not italic font, because it is not amending model code language.

State Agency Acronyms

Below, references will be made to the 2019 California Building Code (CBC), Title 24, Part 2, Volumes 1 and 2, which is based on the 2018 International Building Code. However, the principles and process explained apply to all parts of Title 24 based on a model code. Compared to other parts of Title 24, the CBC has adoptions and California Amendments by the most state agencies. This occurs because of the various jurisdictions granted to the state agencies by state law over subjects within the scope of the building code. Therefore, a building design may be subject to the adoptions and amendments promulgated by several state agencies in the CBC. As an example, the design and construction of a hotel will be subject to CBC provisions adopted by HCD for structural and construction, DSA for accessibility, and SFM for fire and panic safety. So, for this one example, persons applying the CBC must be able to identify all adoptions and amendments by HCD, DSA, and SFM applicable to a hotel.

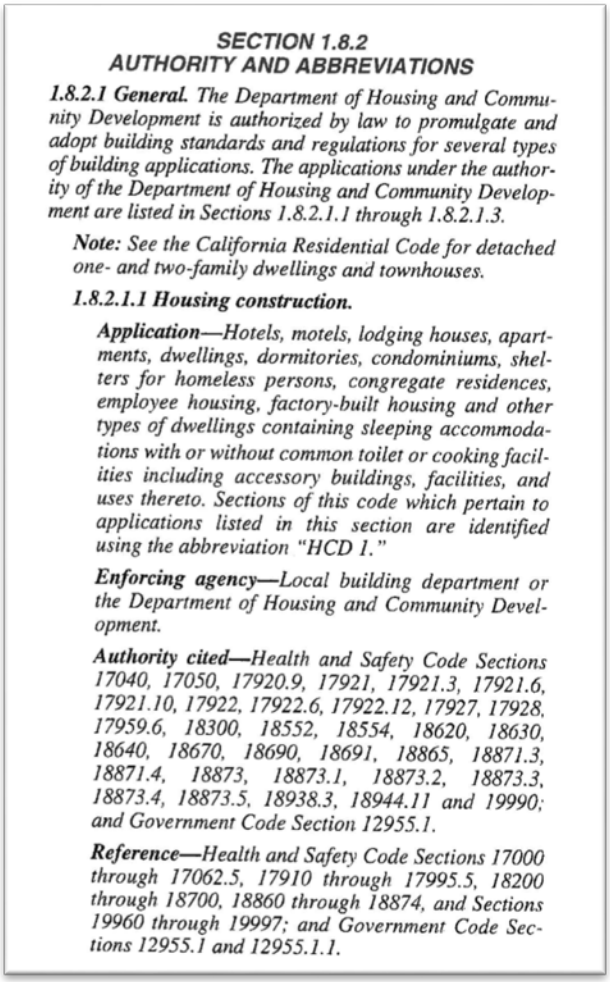
State agency acronyms are used in two locations in the CBC. First, the acronyms are generally found at or in the text of a California Amendment and in the Matrix Adoption Tables. Additionally, state agency acronyms are used throughout Title 24 as a means of identifying California Amendment adoptions that apply to buildings or features of buildings subject to that state agency's regulatory jurisdiction. Some agencies use more than one acronym in order to distinguish adoptions for different applications. HCD uses three acronyms: *HCD 1, HCD 2* and *HCD 1-AC*; DSA uses three acronyms: *DSA-SS, DSA-SS/CC* and *DSA-AC*; and OSHPD uses six acronyms: *OSHPD 1, 1R, 2, 3, 4* and *5*. Each of these acronyms has a different meaning and purpose in the code. A listing of state agency acronyms is provided on page v of the 2019 CBC (and later in this chapter).

In Chapter 1 of the 2019 CBC, Sections 1.2 through 1.14 provide the following information about each of the state agencies:

- The state agency's acronym (HCD 1, SFM, DSA-AC etc.)
  Exception: Section 1.12 and 1.14 do not identify the state agencies' acronyms, which are SL for State Library and SLC for the State Lands Commission.
- The application of each state agency's adoptions.
- The enforcement agency as designated in state law, which may be a state agency, or the local building or fire official.
- The state agency's authority in state law to adopt building standards, and the specific state law that is being implemented by the adoption.

There are provisions in the other parts of the Title 24 based on model codes similar to CBC Sections 1.2 through 1.14.

Below is a reprint of a portion of Section 1.8.2, with Subsections 1.8.2.1 and 1.8.2.1.1, from Chapter 1 in the 2019 CBC. This section is developed by HCD to explain the application of its adoptions in the CBC



SECTION 1.8.2
AUTHORITY AND ABBREVIATIONS

1.8.2.1 General. *The Department of Housing and Community Development is authorized by law to promulgate and adopt building standards and regulations for several types of building applications. The applications under the authority of the Department of Housing and Community Development are listed in Sections 1.8.2.1.1 through 1.8.2.1.3.*

Note: *See the California Residential Code for detached one- and two-family dwellings and townhouses.*

1.8.2.1.1 Housing construction.

Application—*Hotels, motels, lodging houses, apartments, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities including accessory buildings, facilities, and uses thereto. Sections of this code which pertain to applications listed in this section are identified using the abbreviation "HCD 1."*

Enforcing agency—*Local building department or the Department of Housing and Community Development.*

Authority cited—*Health and Safety Code Sections 17040, 17050, 17920.9, 17921, 17921.3, 17921.6, 17921.10, 17922, 17922.6, 17922.12, 17927, 17928, 17959.6, 18300, 18552, 18554, 18620, 18630, 18640, 18670, 18690, 18691, 18865, 18871.3, 18871.4, 18873, 18873.1, 18873.2, 18873.3, 18873.4, 18873.5, 18938.3, 18944.11 and 19990; and Government Code Section 12955.1.*

Reference—*Health and Safety Code Sections 17000 through 17062.5, 17910 through 17995.5, 18200 through 18700, 18860 through 18874, and Sections 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.*

Users of this code should note:

- Section 1.8.2.1 provides a general explanation of the authority granted to HCD to develop and adopt building standards for specific housing occupancies.
- Subsection 1.8.2.1.1 explains that the adoptions in the code identified by the acronym HCD 1 apply to the listed types of housing structures. Accordingly, wherever HCD 1 is found in the CBC, it will mean the provision is adopted by HCD and is applicable to hotels, motels, lodging houses, apartments and dwellings as listed in CBC Section 1.8.

- The “Enforcing agency” responsible for enforcing the HCD 1 adoptions is identified as being the local building department, or HCD where there is no local building department.
- The sections of state law requiring HCD to adopt building standards are identified under “Authority cited.” The sections of law being implemented by the HCD adoptions are identified under “Reference.”

Let’s look at all of the state agency acronyms that are used to identify adoptions within Title 24. The following table provides the acronyms for each state agency and, except as noted, references to sections of Chapter 1, Division 1 of the 2019 California Building Code (CBC). However, as mentioned previously, there are similar provisions within Parts 2.5, 3, 4, 5, 9, 10 and 11 of Title 24 as is appropriate for each part.

Agency Acronym and Name	General Application
BSC, California Building Standards Commission	State owned buildings including University and State College buildings. All buildings not otherwise regulated by other state agencies. See CBC Section 1.2 for details.
BSC-CG, California Building Standards Commission	Green building standards for non-residential buildings. See CBC Section 1.2.2 and Part 11, Section 103 for details.
SFM, Office of the State Fire Marshal	Hotels, apartments, dwelling. Assembly and high-rise buildings and more specified in CBC Section 1.11.
HCD 1, Department of Housing and Community Development	Hotels, apartments, dwellings and more specified in CBC Section 1.8.2.1.1. See Section 104 of Part 11, Title 24 for green standards for residential occupancies.
HCD 2, Department of Housing and Community Development	Permanent buildings within mobilehome parks and special occupancy parks. See CBC Section 1.8.2.1.3 for details.
HCD 1/AC, Department of Housing and Community Development - Access Compliance	Accessibility for covered multifamily dwellings. See CBC Section 1.8.2.1.2 for details.
DSA-SS, Division of the State Architect - Structural Safety	Public schools. See CBC Section 1.9.2 for details.
DSA-AC, Division of the State Architect - Access Compliance	Accessibility in public accommodations and public housing. See CBC Section 1.9.1 through 1.9.1.8 for details.
DSA-SS/CC, Division of the State Architect - Structural Safety/Community Colleges	Community College buildings. See CBC Section 1.9.2.2 for details.
OSHPD 1, Office of Statewide Health Planning and Development	Acute care hospital buildings. See CBC Section 1.10.1 for details.
OSHPD 1R, Office of Statewide Health Planning and Development	Non-conforming hospital buildings removed from acute care service. See CBC Section1.10.1 for details.
OSHPD 2, Office of Statewide Health Planning and Development	Skilled nursing facilities and intermediate care facility buildings. See CBC Section 1.10.2 for details.
OSHPD 3, Office of Statewide Health Planning and Development	Licensed clinics and more. See CBC Section 1.10.3 for details.
OSHPD 4, Office of Statewide Health Planning and Development	Correctional treatment centers. See CBC Section 1.10.4 for details.

Agency Acronym and Name	General Application
OSHPD 5, Office of Statewide Health Planning and Development	Acute psychiatric hospital buildings. See CBC Section 1.10.5 for details.
BSCC, Board of State and Community Corrections	Local detention facilities. See CBC Section 1.3 for details.
DPH, Department of Public Health	Organized camps, animal laboratories, public swimming pools and more. See CBC Section 1.7 for details.
AGR, Department of Food and Agriculture	Dairies and places of meat and poultry inspection. See CBC Section 1.6 for details.
CEC, California Energy Commission	Energy standards for most all buildings. See Title 24, Part 6, the California Energy Code, for details.
CA, Department of Consumer Affairs: Acupuncture Board Board of Barbering and Cosmetology Board of Pharmacy Structural Pest Control Board Veterinary Medical Board	Acupuncture offices, barber and cosmetology shops, pharmacies, structural pest control locations and veterinary facilities. See CBC Section 1.4 for details.
SL, State Library	Public library construction and renovation. See CBC Section 1.12 for details.
SLC, State Lands Commission	Marine oil terminals. See CBC Sections 1.14 and 3101F for details.
DWR, Department of Water Resources	Recycled water systems for water closets and other allowed uses. See Title 24, Part 5 (the California Plumbing Code), Section 1.13.0 for details.

The regulations in Title 24 that are to be enforced by local enforcement agencies (generally the building department and/or fire official) include many adoptions by state agencies identified in Sections 1.2 through 1.14 of the CBC. An abbreviated listing of state agencies with adoptions to be enforced by local government follows:

- BSC-CG for green building standards in CALGreen (Part 11 of Title 24) for nonresidential buildings
- HCD 1 for residential occupancies
- HCD 2 for permanent buildings in mobilehome parks and special occupancy parks where a local enforcement agency has assumed enforcement of the Mobilehome Parks Act in Health and Safety Code (HSC), Division 13, Part 2.1, and Special Occupancy Parks Act in HSC, Division 13, Part 2.3, and implementing regulations in California Code of Regulations Title 25
- HCD 1-AC for accessibility in privately funded multifamily dwellings as defined in the CBC
- DSA-AC for accessibility in public buildings funded by local public funds other than state funds, public accommodations, commercial facilities and publicly funded housing
- OSHPD 3 for licensed clinics
- SFM for hotels, motels, lodging houses, apartments and dwellings, assembly buildings and others

Additional enforcement information is provided in Chapter 6 of this guide.

Below is Section 1404 from the 2019 CBC to show examples of how the state agency acronyms are used in the code text.

SECTION 1404
INSTALLATION OF WALL COVERINGS

1404.1 General. Exterior wall coverings shall be designed and constructed in accordance with the applicable provisions of this section.

1404.1.1 Additional requirements. [DSA-SS & DSA-SS/CC, OSHPD 1, 1R, 2, 4 & 5] *In addition to the requirements of Sections 1404.6, 1404.7, 1404.8, 1404.9, and 1404.10, the installation of anchored or adhered veneer shall comply with applicable provisions of Section 1410.*

1404.2 Weather protection. Exterior walls shall provide weather protection for the building. The materials of the minimum nominal thickness specified in Table 1404.2 shall be acceptable as approved weather coverings.

1404.3 Vapor retarders. Vapor retarders as described in Section 1404.3.3 shall be provided in accordance with Sections1404.3.1 and 1404.3.2, or an approved design using accepted engineering practice for hygrothermal analysis.

1404.3.1 Class I and II vapor retarders. Class I and II vapor retarders shall not be provided on the interior side of frame walls in Zones 1 and 2. Class I vapor retarders shall not be provided on the interior side of frame walls in Zones 3 and 4. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with the *California Energy Code*.

[HCD 1 & HCD 2] *Class I or II vapor retarders shall be provided on the interior side of frame walls of low-rise residential buildings in Climate Zones 14 and 16, as required in the California Energy Code (see definition of "Low-rise residential building").*

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.
4. Conditions where Class III vapor retarders are required in Section 1404.3.2.

1404.3.2 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 1404.3.2 is met. Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the exterior side of the frame wall.

[HCD 1 & HCD 2] *Class III vapor retarders shall be permitted where any one of the conditions in Items 1, 2 or 3 below are met. This section shall apply to "Low-rise residential buildings" as defined in the California Energy Code.*

1. Vented cladding over fiberboard
2. Vented cladding over gypsum
3. Insulated sheathing with R-value ε R4

Spray foam with a minimum density of 2 lbs/ft³ applied to the interior cavity side of OSB, plywood, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam R-value meets or exceeds the specified insulating sheathing R-value.

Users of this code will see:

- Subsection 1404.1.1 is a California Amendment identified by the use of italics that is adopted by DSA-SS, DSA-SS/CC and OSHPD 1, 1R, 2, 4 and 5, as shown.
- The provision in Subsection 1404.3.1 in *italic font print* is a California Amendment adopted only by HCD 1 and HCD 2. CBC Section 1.8 provides the types of buildings subject to HCD 1 and HCD 2 adoptions.
- To determine the application of these California Amendments the reader must refer to Chapter 1, Sections 1.2 through 1.14 as discussed in Chapter 3 of this guide.

In summary, when a state agency acronym appears within the text of Title 24, it identifies the state agency that has adopted that California Amendment. The reader must then determine if the adoption is applicable to the building occupancy or building features at hand. That is done by understanding the jurisdiction of each state agency as explained in CBC Sections 1.2 through 1.14.

When a section has a California Amendment by only one state agency, many times the agency's acronym is not provided. Below is an example: from the CBC.

> **1005.7.1 Doors.** Doors, when fully opened, shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half.
>
> **Exceptions:**
>
> 1. *In other than Group I-2 occupancies,* surface mounted latch release hardware shall be exempt from inclusion in the 7-inch maximum (178 mm) encroachment where both of the following conditions exist:
>
>   1.1. The hardware is mounted to the side of the door facing away from the adjacent wall where the door is in the open position.
>
>   1.2. The hardware is mounted not less than 34 inches (865 mm) nor more than 48 inches (1219 mm) above the finished floor.
>
> 2. The restrictions on door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 occupancies and dwelling units of Group R-3 occupancies.

Section 1005.7.1 is a model code section that includes a California Amendment as evidenced by the *italic font print*. However, there is no state agency acronym to identify the state agency making the amendment. The reader must refer to the Matrix Adoption Table at the beginning of the chapter. There the reader will find that the section is adopted by only SFM. CBC Section 1.10 explains the application of adoptions by SFM.

Matrix Adoption Tables

The Matrix Adoption Tables play an important role in the proper use of Parts 2, 2.5, 3, 4, 5, 9, 10 and 11 in Title 24. The adoptions of the model code language and/or California Amendments by the state agencies are identified in the Matrix Adoption Tables located at the beginning of each chapter, or article or division within a chapter, of the code. When there is no Matrix Adoption Table for a printed model code chapter, the chapter has not been adopted by a state agency.

Exceptions and clarifications:

1. Occasionally the code publishers provide a blank Matrix Adoption Table at the beginning of a model code chapter. If a Matrix Adoption Table is provided in the code, but it is blank (showing no "Xs" for adoptions), then the chapter is not adopted nor applicable to any of the buildings or building features subject to adoptions by state agencies.
2. For those building occupancies or building features not subject to the adoptions by a state agency, the published model code provisions apply. For example, no state agency has authority to regulate the structural system of a Group B, M, or S Occupancy (unless part of a state regulated building occupancy such as a school or hospital), thus the published model code provisions apply.
3. CALGreen (Part 11 of Title 24) is not based on a model code. Matrix Adoption Tables are provided to illustrate adoptions by various state agencies.

There are also Matrix Adoption Tables for chapters that are California Amendments in their entirety such as in California Building Code (CBC, Title 24, Part 2) Chapters 7A and 11A.

There are no Matrix Adoption Tables in Parts 1, 6, 8 or 12 of Title 24. These parts are not based on a model code. The state agencies provide information in each of these parts to clarify the adoption and application of the part to specific building types, features or equipment. Below is a portion of the Matrix Adoption Table for Chapter 3 of the 2019 California Building Code.

CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE
CHAPTER 3 – OCCUPANCY CLASSIFICATION AND USE

(Matrix Adoption Tables are nonregulatory, intended only as an aid to the code user. See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC -CG	SFM	HCD			DSA			OSHPD						BSCC	DPH	AGR	DWR
				1	2	1/AC	AC	SS	SS/CC	1	1R	2	3	4	5				
Adopt entire chapter	X							X	X	X		X	X						
Adopt entire chapter as amended (amended sections listed below)			X	X	X														
Adopt only those sections that are listed below																			
Chapter / Section																			
302.1			X	X	X														
302.1.3																			
303.1			X																
303.2			X																
303.7			X																

When reading a Matrix Adoption Table, look for these features:

1. The state adopting agencies are identified by their acronyms in the top row.
2. The next three rows tell how the chapter is adopted by each of the state agencies. The chapter is adopted in whole without amendment, the chapter is adopted in whole with amendments that are identified in the table, or only selected sections of the chapter are adopted.
3. Starting with the 6th row, code section and subsection numbers are listed in the left column.
4. An “X” in a column identifies an adoption by the state agency identified at the top of the column. For example, SFM adopts the entire chapter but amends the sections and subsections of Chapter 3 marked by the “X” opposite the section or subsection number. SFM adoptions apply as identified in Section 1.11 in Chapter 1 of the 2019 CBC.

As shown above, rows two through four at the top of the Matrix Adoption Table provide the key for how the chapter is adopted. Further, under a column for an individual state agency:

- When an "X" is located opposite "Adopt entire chapter," then the entire chapter is adopted without amendment by that state agency and it may be enforced as applicable (see the “BSC” column above), or
- When an "X" is located in the row "Adopt entire chapter as amended (amended sections listed below)," the entire chapter is adopted and those sections or subsections marked by the "X" will include California Amendments adopted by that state agency (see the “SFM” column above), or

- When there is an “X” in the row “Adopt only those sections listed below,” apply only those sections marked with an “X” and do not apply the unmarked sections.
- If there is no “X” in any of the top three rows of the Matrix Adoption Table, then that state agency did not adopt any provision of the chapter.

Apply the adopted sections to only building occupancies or building features within the code adoption jurisdiction of the state agency or agencies making the adoption. The adoption jurisdiction and application of the adoptions by the state agencies is explained in Sections 1.2 through 1.14 of the 2019 California Building Code. Similar explanations are provided in each part of Title 24.

Let’s looks again at the Matrix Adoption Table for CBC Chapter 3 (shown in part).

CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE
CHAPTER 3 – OCCUPANCY CLASSIFICATION AND USE

(Matrix Adoption Tables are nonregulatory, intended only as an aid to the code user.
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC -CG	SFM	HCD			DSA			OSHPD						BSCC	DPH	AGR	DWR
				1	2	1/AC	AC	SS	SS/CC	1	1R	2	3	4	5				
Adopt entire chapter	X							X	X	X		X	X						
Adopt entire chapter as amended (amended sections listed below)			X	X	X														
Adopt only those sections that are listed below																			
Chapter / Section																			
302.1			X	X	X														
302.1.3																			
303.1			X																
303.2			X																
303.7			X																

1. The first “X” under BSC in the “Adopt Entire Chapter” row indicates BSC adopts the entire chapter without amendment. CBC Section 1.2 advises that BSC adoptions in the CBC apply to state owned buildings, among other types of buildings.
2. In the SFM column, we see that SFM adopts the entire chapter but amends numerous sections to implement requirements of state law. Amended sections are identified by the “Xs”. All other sections of the chapter not marked by an "X" are adopted by SFM without amendment. See Section 1.11 for the application of SFM adoptions.
3. BSCC and DPH adopt no part of Chapter 3 because there is no "X" in any of the three rows of the table to indicate adoption of the chapter. In Chapter 1 of the CBC we will find that BSCC is the acronym for the Board of State and Community Corrections, and DPH is the acronym for the Department of Public Health.

4. HCD 1 adopts the entire chapter as amended, and amends subsection 302.1. CBC Section 1.8.2.1.1 advises that HCD 1 adoptions apply to several types of residential occupancies.
5. Subsection 302.1 is adopted for HCD 2 applications. CBC Section 1.8.2.1.3 explains that HCD 2 adoptions apply to permanent buildings in mobilehome parks and special occupancy parks.

Additional information on how to read Matrix Adoption Tables is provided on pages vi and vii of the 2019 CBC. Similar information is provided near the front of Parts 2.5, 3, 4, 5, 9, 10 and 11.

Procedural Steps for Using Title 24

The following procedural steps, when performed in the order shown, will ensure the proper application of Title 24 provisions. Much of this is a summary of information already provided, presented in the order it is applied.

1. **Identify Jurisdiction**: Identify the state agencies having jurisdiction over the subject building occupancy, feature or equipment in the project. Learn each of the state agency acronyms by studying California Building Code (CBC, Part 2 of Title 24) Sections 1.2 through 1.14. Each part of Title 24 has similar explanations of the state agencies' jurisdiction and application of their adoptions in that part. The table beginning on page 14 of this guide provides a listing of state agency acronyms, and the table beginning on page 40 provides a summary of the provisions of CBC Sections 1.2 through 1.14. However, use these summaries only to learn how to apply the code and not as a substitute for the code.
2. **Check the Matrix Adoption Tables**: Verify that each Title 24 Parts 2, 2.5, 3, 4 5, 9, 10 and 11 section (model code and/or California Amendment) you are applying is shown in the Matrix Adoption Table as being adopted by the state agency having jurisdiction over the subject building occupancy, feature or equipment. The Matrix Adoption Tables identify each section or subsection of the code and which state agency adopts the model code text, California Amendment or California Standard. In some cases, only a selected portion of a model code section is adopted. Additionally, be sure to read any notes (or footnotes) provided with a Matrix Adoption Table.

   When there is no state agency acronym within the text of a California Amendment, it generally means that only one state agency has adopted that amendment. Refer to the Matrix Adoption Table for the chapter containing the subject section or subsection to determine which state agency has adopted that California Amendment. Then, determine if the state agency has jurisdiction for the subject building occupancy, feature or equipment at hand.

3. **Apply the code:**
    a. **When a State Agency Has Jurisdiction:** Apply Title 24 Parts 2, 2.5, 3, 4, 5, 9, 10 and 11 provisions that are adopted by the state agencies having jurisdiction over the subject building occupancy, feature or equipment at hand. The Matrix Adoption Tables identify each adopted section or subsection of the code and the state agency, if any. Apply the provisions of Title 24 Parts 1, 6, 8, and 12 as explained in the preamble pages of each of these parts. These parts do not have Matrix Adoption Tables.
    b. **When No State Agency Has Jurisdiction.** Apply the published model code provisions when there is no state agency with jurisdiction for the subject building occupancy, feature or equipment.
4. **Apply Local Amendments:** Apply local amendments to Title 24 provisions that have been lawfully adopted, filed with the appropriate state agency as required by law, and are in place on the date of application for a construction permit. See Local Code Adoption beginning on page 47 of this guide for information regarding local amendments.

An accomplished user of Title 24 will become familiar with the use of Matrix Adoption Tables and the jurisdictions of the state agencies. Determinations of adoption and application of code provisions can then be made quickly and accurately.

Buying and Maintaining Title 24

All parts of the California Building Standards Code, Title 24 of the California Code of Regulations (Title 24) are available to read-only online via the California Building Standards Commission website. Using the online versions of Title 24 may be convenient for occasional reference but not practical while performing plan review or building inspection activities.

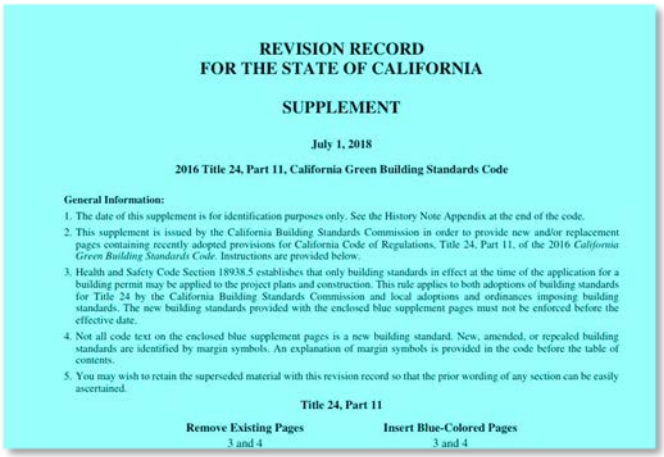
Title 24 may be purchased as a set or by individual parts from the publishers:

- International Code Council (ICC) for all Parts of Title 24
  ICC Online Store: shop.iccsafe.org/state-and-local-codes/california.html
  ICC Errata Central for Supplements & Errata: www.iccsafe.org/errata-central
  (all Parts except 3, 4 & 5)
- International Association of Plumbing and Mechanical Officials (IAPMO) for Parts 4 and 5
  IAPMO Online Store: www.iapmomembership.org
- National Fire Protection Association (NFPA) for Part 3
  2019 Part 3: NFPA Online Store: www.nfpa.org/codes-and-standards
  2016 Part 3: BNi Books Online Store: www.bnibooks.com

Title 24 is published as a new edition in new binders every three years (triennial code adoption cycle). During the three-year life of a current edition of Title 24, additions, amendments, repeals and corrections occur. These updates are published in the form of *Supplements* and *Errata*.

Supplements

Supplements for insertion into Title 24 are the result of CBSC's approved additions, amendments, repeals and/or emergency building standards within an existing part of Title 24. Supplements are printed on blue paper with the words *BLUE* and *SUPPLEMENT* and the effective date printed at the bottom of each page for identification purposes.



REVISION RECORD
FOR THE STATE OF CALIFORNIA

SUPPLEMENT

July 1, 2018

2016 Title 24, Part 11, California Green Building Standards Code

General Information:

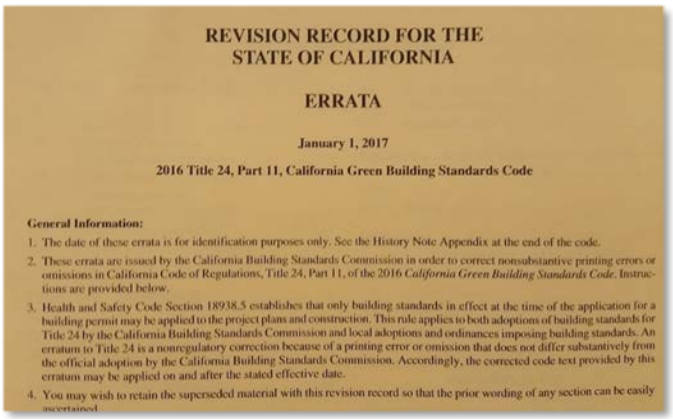
1. The date of this supplement is for identification purposes only. See the History Note Appendix at the end of the code.
2. This supplement is issued by the California Building Standards Commission in order to provide new and/or replacement pages containing recently adopted provisions for California Code of Regulations, Title 24, Part 11, of the 2016 *California Green Building Standards Code*. Instructions are provided below.
3. Health and Safety Code Section 18938.5 establishes that only building standards in effect at the time of the application for a building permit may be applied to the project plans and construction. This rule applies to both adoptions of building standards for Title 24 by the California Building Standards Commission and local adoptions and ordinances imposing building standards. The new building standards provided with the enclosed blue supplement pages must not be enforced before the effective date.
4. Not all code text on the enclosed blue supplement pages is a new building standard. New, amended, or repealed building standards are identified by margin symbols. An explanation of margin symbols is provided in the code before the table of contents.
5. You may wish to retain the superseded material with this revision record so that the prior wording of any section can be easily ascertained.

Title 24, Part 11

Remove Existing Pages	Insert Blue-Colored Pages
3 and 4	3 and 4

Errata

Errata are issued to correct nonsubstantive errors in an existing part of Title 24. Errata are printed on buff paper with the words *BUFF* and *ERRATA* and the effective date printed at the bottom of each page.



REVISION RECORD FOR THE
STATE OF CALIFORNIA

ERRATA

January 1, 2017

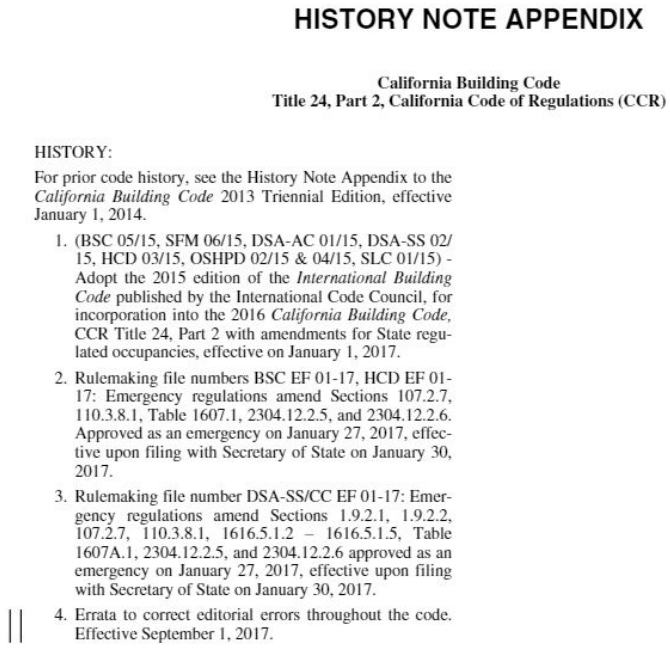
2016 Title 24, Part 11, California Green Building Standards Code

General Information:

1. The date of these errata is for identification purposes only. See the History Note Appendix at the end of the code.
2. These errata are issued by the California Building Standards Commission in order to correct nonsubstantive printing errors or omissions in California Code of Regulations, Title 24, Part 11, of the 2016 *California Green Building Standards Code*. Instructions are provided below.
3. Health and Safety Code Section 18938.5 establishes that only building standards in effect at the time of the application for a building permit may be applied to the project plans and construction. This rule applies to both adoptions of building standards for Title 24 by the California Building Standards Commission and local adoptions and ordinances imposing building standards. An erratum to Title 24 is a nonregulatory correction because of a printing error or omission that does not differ substantively from the official adoption by the California Building Standards Commission. Accordingly, the corrected code text provided by this erratum may be applied on and after the stated effective date.
4. You may wish to retain the superseded material with this revision record so that the prior wording of any section can be easily ascertained.

History and Effective Date

A History Note Appendix is included with all issued supplements and errata, and provides the sequential history of supplements and errata issued for the affected part of Title 24. The History Note Appendix should be inserted in your Title 24 because the information includes the state agency(ies) involved in amending the building standard, an abbreviated description of the change, the dates approved by CBSC and filed with the Secretary of State, and the effective date.



HISTORY NOTE APPENDIX

California Building Code
Title 24, Part 2, California Code of Regulations (CCR)

HISTORY:

For prior code history, see the History Note Appendix to the *California Building Code* 2013 Triennial Edition, effective January 1, 2014.

1. (BSC 05/15, SFM 06/15, DSA-AC 01/15, DSA-SS 02/15, HCD 03/15, OSHPD 02/15 & 04/15, SLC 01/15) - Adopt the 2015 edition of the *International Building Code* published by the International Code Council, for incorporation into the 2016 *California Building Code*, CCR Title 24, Part 2 with amendments for State regulated occupancies, effective on January 1, 2017.
2. Rulemaking file numbers BSC EF 01-17, HCD EF 01-17: Emergency regulations amend Sections 107.2.7, 110.3.8.1, Table 1607.1, 2304.12.2.5, and 2304.12.2.6. Approved as an emergency on January 27, 2017, effective upon filing with Secretary of State on January 30, 2017.
3. Rulemaking file number DSA-SS/CC EF 01-17: Emergency regulations amend Sections 1.9.2.1, 1.9.2.2, 107.2.7, 110.3.8.1, 1616.5.1.2 – 1616.5.1.5, Table 1607A.1, 2304.12.2.5, and 2304.12.2.6 approved as an emergency on January 27, 2017, effective upon filing with Secretary of State on January 30, 2017.
4. Errata to correct editorial errors throughout the code. Effective September 1, 2017.

How to Obtain Supplements and Errata

The first and recommended method is to register your purchase of Title 24 online with the publisher. The publisher will mail issued supplements and errata to you as they are published. Instructions for online registration are included with purchased editions of Title 24.

The second method is to access CBSC's website, www.dgs.ca.gov/bsc, and click on the *Codes* tab, then select the appropriate edition of Title 24. The links will take you to the publishers' websites where you can download and print supplements and errata. If you do not use blue and buff paper in your printer, you will not benefit from the color-coding. However, the words *BLUE* and *BUFF* are printed at the bottom of each supplement and errata page. Note that the original code text cannot be downloaded and printed due to copyright protections.

You may also choose to contact the publishers using the information provided at the beginning of this section.

Updating Procedure

CBSC recommends either of the following methods for maintaining your Title 24.

Method A – Remove and Insert

1. Read the “General Information” on the cover sheet provided with each issued supplement or errata.
2. Remove superseded pages as indicated and replace with the new pages.
3. Place the cover sheet on top of the removed pages. Staple or clip these pages together as a set.
4. Place the set in the back of the code binder with the most recent on top. Over the three-year life of the edition of Title 24, you may have more than one set of supplements and errata.
5. Also place the History Note Appendix in the back of the code binder on top of the sets of superseded pages, with the most recent on top.

Method B – Retain and Insert

1. Read the “General Information” on the cover sheet provided with each issued supplement or errata.
2. Insert the new pages and – instead of removing the superseded pages – fold them in half, maintaining the superseded pages adjacent to the new pages. This includes updating the History Note Appendix.
3. Place the cover sheet of issued supplements or errata into the front pocket of your binder for reference.

   This method allows for easy access to current code requirements if a supplement is not yet effective, and for verification of previous code requirements. Keep in mind that a supplement may not yet be effective, so retaining the superseded page(s) is essential for accurate application of the code.

Need help? Contact us at cbsc@dgs.ca.gov or (916) 263-0916.

Chapter 4. Adoptions for Specific Buildings

Applying the California Building Standards Code, Title 24, California Code of Regulations (Title 24) is easier when the user has an understanding of the application of the various adoptions by the state agencies. This can be accomplished by studying Sections 1.2 through 1.14 in the 2019 California Building Code (CBC), Part 2 of Title 24, and the referenced state laws.

This chapter covers specific code adoptions for some common building occupancies, building types or features, and the enforcement responsibility. Most building standards require enforcement by the local building official and/or fire official, but a few are enforced by a state agency. The information is generalized because not every situation or exception can be included. The state laws referenced in this section may be accessed at the California Legislative Information website at https://leginfo.legislature.ca.gov/faces/codes.

Group R Occupancies

Hotels, motels, lodging houses, condominiums, apartments and dwellings are subject to the adopted model code, and California Amendments and Standards promulgated by multiple state agencies. In general, HCD 1, HCD 1/AC, SFM, DSA-AC and CEC adoptions in Title 24 apply to these structures. See the list in Chapter 3 for details of the agency acronyms. The code user must understand how the adoptions apply.

a. **Structural, Mechanical, Electrical and Plumbing:** The State Housing Law within Health and Safety Code (HSC), Division 13, Part 1.5, commencing with Section 17910, charges the Department of Housing and Community Development (HCD) with the responsibility for developing building standards for hotels, motels, apartments, condominiums, lodging houses and dwellings (including one- and two-family dwellings). The scope of HCD's authority is limited to structural, mechanical, electrical, plumbing systems and related equipment, and green building standards. Such adoptions are shown by the acronym HCD 1 within the code and Matrix Adoption Tables. Read more about HCD adoptions in Section 1.8 of the 2019 California Building Code (CBC, Part 2 of Title 24). Also see HSC Sections 17921(a) and 17922.

b. **Fire and Panic Safety:** State Housing Law within the HSC (Section 17921(b)) assigns the responsibility for developing fire and panic safety building standards for these structures to the Office of the State Fire Marshal. Such adoptions are shown by the acronym SFM within the code text and Matrix Adoption Tables. Read more about SFM adoptions in section 1.11 of the 2019 CBC.

c. **Accessibility:** HSC Division 13, Parts 5.3 and 5.5, including Sections 19952 through 19959.5, assigns the responsibility for developing building standards for

accessibility in places of public accommodations and commercial facilities to the Division of the State Architect (DSA). Such adoptions are shown in the code and Matrix Adoption Tables by the acronym DSA-AC. Hotels and motels are included in the definition of “Place of Public Accommodation” and are therefore subject to accessibility requirements adopted by DSA. DSA-AC adoptions also apply to publicly funded housing, regardless of the number of dwelling units. Read more about DSA-AC adoptions in section 1.9 of the 2019 CBC and Government Code Section 12955.1.

Government Code Section 12955.1 assigns the responsibility for developing building standards for accessibility in covered multifamily dwellings to the Department of Housing and Community Development (HCD). Lodging houses, time shares, apartment buildings with three or more dwelling units, and condominiums with four or more dwelling units are defined as multifamily dwellings subject to accessibility adoptions by HCD. Such adoptions are shown in the code and Matrix Adoption Tables with the acronym HCD 1/AC. One- and two-family dwellings are not subject to accessibility requirements unless publicly funded. Read Sections 1.8.2.1.2, 1101A and 1102A of the 2019 CBC for more information on the application of HCD 1/AC adoptions.

d. **Energy Conservation:** The California Public Resources Code, Division 15, commencing with Section 25000, assigns the responsibility for developing building standards for energy efficiency and conservation to the California Energy Commission (CEC). Hotels, motels, condominiums, apartments, lodging houses and dwellings are subject to the adoptions for energy conservation by CEC. Such adoptions are shown by the acronym CEC in the code text and Matrix Adoption Tables in the parts of Title 24 with a Matrix Adoption Table. The applicable provisions are predominately in the 2019 California Energy Code, Part 6 of Title 24. Read Section 100 of the 2019 California Energy Code for more information and applications of CEC adoptions.

e. **Green Building Standards:** The 2019 California Green Building Standards Code (CALGreen, Part 11 of Title 24), includes mandatory provisions applicable to residential buildings, and voluntary standards. The CALGreen mandatory and voluntary green building standards are adopted by HCD under the authority of the State Housing Law discussed above. The HCD adoptions are identified in

the code and Matrix Adoption Tables by the acronym HCD 1. Read Sections 101, 104 and 301 of CALGreen for more detailed scope and application information.

f. **Enforcement:** HSC Sections 17960 (within the State Housing Law), 13145 and 13146 assign enforcement responsibility to the local building and/or fire official. In the absence of local enforcement, or where the enforcement authority is removed pursuant to HSC Section 17952, HCD assumes the responsibility for enforcement. See Chapter 6 of this guide for more information about enforcement responsibilities.

Group A, B, M and similar Occupancies

This information is limited to privately owned buildings of A, B, M and similar occupancies, and that are not part of a hospital or medical care facility under the jurisdiction of the Office of Statewide Health Planning and Development.

a. **Structural, Mechanical, Electrical, and Plumbing:** No state agency has authority to adopt specific structural, mechanical, electrical or plumbing standards for these occupancies of non-governmentally funded buildings. Apply the published Title 24 provisions applicable to the occupancy and structure type.

b. **Fire and Panic Safety:** Health and Safety Code (HSC), Division 12, Part 2, commencing with Section 13100, assigns the responsibility for developing building standards for fire and panic safety to the Office of the State Fire Marshal. Such adoptions are shown by the acronym SFM within the code and Matrix Adoption Tables. Requirements are adopted for several types of buildings and building uses as specified in Section 1.11 of the 2019 CBC.

c. **Accessibility:** Buildings of Group A, B and M Occupancies most often meet the definition of a public building, place of public accommodation, or commercial facility. HSC Sections 19952 through 19959 assign the responsibility for developing building standards for accessibility in public buildings, public accommodations and commercial facilities to the Division of the State Architect (DSA). Read more about DSA-AC adoptions in Section 1.9 of the 2019 CBC.

d. **Energy Conservation:** Buildings of Group A, B and M Occupancies are subject to the adoptions for energy efficiency and conservation by the California Energy Commission. Such adoptions are shown by the acronym CEC in the code text and Matrix Adoption Tables in parts with a Matrix Adoption Table. The applicable provisions are predominately located in Part 6, the 2019 California Energy Code.

e. **Green Building Standards:** Buildings of Group A, B and M Occupancies are subject to the mandatory provisions in the 2019 California Green Building Standards Code (CALGreen, Part 11 of Title 24). Mandatory green building standards for nonresidential buildings are adopted by the California Building Standards Commission (CBSC) under the authority of Sections 18930.5, 18938 and 18940.5 of HSC Division 13, Part 2.5 (California Building Standards Law). The acronym BSC-CG is used in the code and Matrix Adoption Tables to identify the applicable standards. CBSC also adopts voluntary green building standards in CALGreen. Read Sections 101, 102 and 103 in Chapter 1 of CALGreen for more details, and the scope and application of green building standards adopted by CBSC.

f. **Enforcement:** State law assigns enforcement responsibility to the local building and/or fire official. Reference HSC Sections 13145, 13146, 18938(b), and 18948 regarding code application, enforcement and related matters. See Chapter 6 of this guide and Section 1.11.2 of the 2019 CBC for more information about local enforcement responsibilities relating to these occupancies.

Hospitals and Medical Care Facilities

In this section, the term "hospital and medical care facilities" refers to buildings identified in Section 1.10 of the 2019 CBC.

a. **Structural, Mechanical, Electrical, and Plumbing:** Health and Safety Code (HSC), Division 107, Part 1 and Part 7, assigns the responsibility for developing architectural, structural, mechanical, electrical, and plumbing building standards for hospital and medical care facilities to the Office of Statewide Health Planning and Development (OSHPD). Such adoptions are shown in the code text and Matrix Adoption Tables by the acronyms OSHPD 1, OSHPD 1R, OSHPD 2, OSHPD 3, OSHPD 4 and OSHPD 5. Each of these six acronyms relates to a specific type of medical building. Read Section 1.10 of the 2019 CBC for additional information about the application of OSHPD adoptions and of the various medical buildings under its jurisdictions.

b. **Fire and Panic Safety:** HSC Division 12, Part 2, commencing with Section 13100, assigns the responsibility for developing building standards for fire and panic safety to the Office of the State Fire Marshal. Such adoptions are shown by the acronym SFM within the code and Matrix Adoption Tables. Requirements are adopted for several types of buildings and building uses as specified in Section 1.11 of the 2019 CBC.

c. **Accessibility:** Hospitals and medical care facilities are categorized as places of public accommodation, as defined in state law and in Chapter 2 of the 2019 CBC. HSC Sections 19952 through 19959 assigns the responsibility for developing building standards for accessibility in and about public accommodations to the Division of the State Architect (DSA). Government Code Sections 4450 through 4459 requires DSA to develop building standards for accessibility in and about public buildings. Such adoptions are identified in the code text and Matrix Adoption Tables by the acronym DSA-AC. Read more about DSA-AC adoptions in section 1.9 of the 2019 CBC.

d. **Energy Conservation:** Hospitals and medical care buildings of or including Groups A, B, E, F, H, I, M, R, S or U Occupancies are subject to the adoptions for energy conservation by the California Energy Commission (CEC). The California Public Resources Code, Division 15, commencing with Section 25000, assigns the responsibility for developing building standards for energy efficiency and conservation to CEC. Such adoptions are shown by the acronym CEC in the code text and Matrix Adoption Tables in parts containing Matrix Adoption Tables. The applicable provisions are predominately in the California Energy Code, Part 6 of Title 24. Read Section 100 of the California Energy Code for more information and applications of CEC adoptions.

e. **Green Building Standards:** The Office of Statewide Health Planning and Development (OSHPD) has adopted administrative and voluntary green building standards in the 2019 California Green Building Standards Code (CALGreen, Part 11 of Title 24). The acronyms OSHPD 1, OSHPD 2, and OSHPD 4 are used in the code and Matrix Adoption Tables to identify the adoptions. OSHPD has not adopted green standards for buildings subject to OSHPD 3 adoptions. See Section 106 in Chapter 1 of CALGreen.

f. **Enforcement:** Enforcement, including plan review and inspection, of the Title 24 building standards adopted by DSA-AC, OSHPD, and SFM applicable to hospital and medical care facilities identified in Section 1.10 of the 2019 CBC is performed, or overseen, by OSHPD. See Chapter 6 of this guide for more information about enforcement responsibilities.

   Exceptions:

   1. Clinics as defined are subject to building standards identified by the acronym OSHPD 3. Building standards adopted for OSHPD 3 application

are to be enforced by the local building department as specified in Section 1.10.3 of the 2019 CBC.

2. Buildings on properties with hospitals and medical care facilities that are not used for medical purposes, such as office buildings, storage buildings and parking garages, are subject to the building standards applicable to the building occupancy and the enforcement of the local fire and building official.
3. HSC Section 129680(c) provides that where more restrictive local building standards have been adopted that apply to the occupancy of a building used as a hospital or medical care facility, OSHPD shall also enforce the more restrictive local building standards in hospitals and medical care facilities.

Public School Buildings

In this section, the term “school buildings” means the buildings identified in Section 1.9.2 of the 2019 California Building Code (CBC, Part 2 of Title 24), and defined in Sections 17283 and 81130.5 of the California Education Code, including elementary and secondary schools, and community colleges. State college and university buildings are included in the State Owned Buildings section that follows this section.

Note: Title 24, Part 1, Chapter 4, Group 1, commencing with Section 4-301, contains important regulations that should be used in conjunction with the balance of Title 24 when working with school buildings.

a. **Structural, Mechanical, Electrical, and Plumbing:** California Education Code, Division 1, Part 10.5, Chapter 3, Sections 17310, and 81142 assigns the responsibility for development of building standards for structural, mechanical, electrical and plumbing systems in school buildings to the Department of General Services, that then delegates the responsibility to the Division of the State Architect (DSA). Such adoptions are shown in the code text and or Matrix Adoption Tables by the acronym DSA-SS. DSA adoptions specific to community college buildings are identified by the acronym DSA-SS/CC. Read Section 1.9.2 of the 2019 CBC and the California Administrative Code (CAC, Title 24, Part 1), Chapter 4, Group 1 for more information regarding school buildings subject to DSA adoptions and exceptions.
b. **Fire and Panic Safety:** Health and Safety Code (HSC), Division 12, Part 2, Section 13143 and Section 17074.50 of the California Education Code assign the responsibility for developing building standards for fire and panic safety and fire sprinkler systems in school buildings to the Office of the State Fire Marshal. Such adoptions are shown by the acronym SFM within the code text and Matrix Adoption Tables. Read Section 1.11 of the 2019 CBC for more information and applications of the SFM adoptions.

c. **Accessibility:** Government Code Sections 4450 through 4460 and HSC Sections 19952 through 19959 assign the responsibility for developing building standards for accessibility in public buildings and places of public accommodation to the Division of the State Architect (DSA). Publicly funded school buildings and grounds are both public buildings and places of public accommodations. Adoptions for accessibility by DSA are identified in the code text and Matrix Adoption Tables by the acronym DSA-AC. Read more about DSA-AC adoptions relating to school buildings in:
    - Section 1.9 of the 2019 CBC
    - Section 4-302 of the 2019 CAC
    - Chapter 5 of the CAC

d. **Energy Conservation:** The California Public Resources Code, Division 15, commencing with Section 25000, assigns the responsibility for developing building standards for energy efficiency and conservation to the California Energy Commission (CEC). School buildings of Groups A, B, E, F, H, R, S or U Occupancies are subject to the adoptions by CEC. Such adoptions are shown by the acronym CEC in the code text and Matrix Adoption Tables in parts with a Matrix Adoption Table. The applicable provisions are predominately in The California Energy Code, Part 6 of Title 24. Read Section 100 of the 2019 California Energy Code for more information and applications of CEC adoptions.

e. **Green Building Standards:** Education Code Sections 17310 and 81142 authorize the Department of General Services (DGS) to develop regulations deemed necessary, proper, or suitable for school buildings. Mandatory provisions of the California Green Building Standards Code (CALGreen, Part 11 of Title 24), have been adopted by the Division of the State Architect (a division within DGS) for application to school buildings. The acronym DSA-SS is used in the code and Matrix Adoption Tables to identify the adopted building standards. For more information on green building standards applicable to public school buildings read Sections 101.3.1 and 105 in Chapter 1 of CALGreen.

f. **Enforcement:** Enforcement, including plan review and inspection, is carried out by the Division of the State Architect (DSA). Read Sections 1.9.2 .1 and 1.9.2.2 of the 2019 CBC and Chapter 4, Group 1 of the 2019 CAC for more information.

State Owned Buildings

a. **Structural, Mechanical, Electrical, and Plumbing:** State owned buildings, including office buildings occupied by state agencies, and buildings of the University of California and California State University, are subject to specific adoptions by the California Building Standards Commission shown by the acronym BSC in the code text and Matrix Adoption Tables. Read Section 1.2.1

of the 2019 CBC and referenced state laws for more information. Also read Article 2, commencing with Section 4-223 in Chapter 4 of the 2019 CAC.

b. **Fire and Panic Safety:** State owned buildings, including office buildings occupied by state agencies, and buildings of the University of California and California State University, are subject to specific adoptions by the Office of the State Fire Marshal shown by the acronym SFM in the code text and Matrix Adoption Tables. Read Section 1.11 of the 2019 CBC and referenced state laws for more information.

c. **Accessibility:** Government Code Sections 4450 through 4460 assign the responsibility for developing building standards for accessibility in public buildings and places of public accommodation to the Division of the State Architect (DSA). Publicly funded state owned buildings, including state owned school buildings and grounds, are both public buildings and places of public accommodations. Adoptions for accessibility by the Division of the State Architect are identified in the code text and Matrix Adoption Tables by the acronym DSA-AC. Read more about DSA-AC adoptions relating to school buildings in Section 1.9 of the 2019 CBC. Also read Article 2 commencing with Section 4-223 in Chapter 4, and Chapter 5 commencing with Section 5-101, of the CAC.

d. **Energy Conservation:** The California Public Resources Code, Division 15, commencing with Section 25000, assigns the responsibility for developing building standards for energy efficiency to the California Energy Commission (CEC). State buildings and state owned school buildings of Groups A, B, E, F, H, R, S or U Occupancies are subject to the adoptions by CEC. Such adoptions are shown by the acronym CEC in the code text and Matrix Adoption Tables in parts with a Matrix Adoption Table. The applicable provisions are predominately in the California Energy Code, Part 6 of Title 24. Read Section 100 of the 2019

California Energy Code for more information and applications of CEC adoptions.

e. **Green Building Standards:** The California Building Standards Commission (CBSC) under the authority of Section 18930.5 of HSC Division 13, Part 2.5 (California Building Standards Law), has adopted green building standards applicable to state owned buildings. The acronym BSC-CG is used in the code and Matrix Adoption Tables to identify the applicable standards. The California Green Building Standards Code (CALGreen, Part 11 of Title 24) also establishes voluntary green building standards in addition to the mandatory standards. Read Section 101, 102 and 103 in Chapter 1 of CALGreen for more information on the application of green building standards adopted by CBSC.

f. **Enforcement:** Enforcement, including plan review and inspection, is carried out by the California Department of General Services for buildings to be occupied by state agencies. Enforcement for campus projects is carried out by the University of California and California State University.

Permanent Buildings in Mobilehome and Special Occupancy Parks

The following discussion applies to permanent buildings in mobilehome parks and special occupancy parks, such as recreational vehicle parks. This discussion does not apply to attachments and accessory structures to manufactured homes, multifamily manufactured homes, mobilehomes or recreational vehicles. A Mobilehome Park is defined in Health and Safety Code Section (HSC) 18214. A Special Occupancy Park is defined in HSC Section 18862.43.

Note: A permanent building is defined in HSC Sections 18214.5 and 18862.33 as a permanent structure under the control and ownership of the mobilehome park or special occupancy park owner or operator. It does not include a manufactured home, multifamily manufactured home, mobilehome, factory-built housing, or recreational vehicle, or an accessory structure thereto.

a. **Structural, Mechanical, Electrical, and Plumbing:** The Mobilehome Parks Act in HSC Division 13, Part 2.1, commencing with Section 18200, and the Special Occupancy Parks Act, Division 13, Part 2.3, commencing with Section 18860, assign the responsibility for developing building standards for the permanent buildings in these parks to the Department of Housing and Community Development. Such adoptions are shown in the code text and Matrix Adoption Tables with the acronym HCD 2. Read Section 1.8.2.1.3 of the 2019 CBC for more information about HCD 2 adoptions.

b. **Fire and Panic Safety:** Most often permanent buildings in mobilehome and special occupancy parks are of occupancy classifications (generally Group A,

B, M, S, U and R Occupancy) that are subject to adoptions by the Office of the State Fire Marshal. Such adoptions are shown in the code text and Matrix Adoption Tables by the acronym SFM. Read more about the application of SFM adoptions in Section 1.11 of the 2019 CBC.

c. **Accessibility:** HSC Sections 19952 through 19959 assign the responsibility for developing building standards for accessibility in places of public accommodation and commercial facilities to the Division of the State Architect. Such adoptions are shown in the code text and Matrix Adoption Tables by the acronym DSA-AC. Permanent buildings in mobilehome and special occupancy parks are most often privately funded places of public accommodation and are therefore subject to accessibility requirements adopted by DSA. However, there may be exceptions for buildings for the exclusive use of the residents. There may also be Group R Occupancies subject to the accessibility adoptions by HCD shown with the acronym HCD 1-AC. Contact HCD for clarification.

   Read more about DSA-AC adoptions in section 1.9 of the 2019 CBC. Read Title 25, Housing and Community Development, Division 1, Chapter 2.2, Section 2327, regarding accessibility to camping cabins located in Special Occupancy Parks.

d. **Energy Conservation:** The California Public Resources Code, Division 15, commencing with Section 25000, assigns the responsibility for developing building standards for energy efficiency to the California Energy Commission (CEC). Most often permanent buildings in mobilehome and special occupancy parks are of occupancy classifications (Group A, B, M, R, S and U Occupancies) that are subject to adoptions for energy conservation by CEC. Such adoptions are shown by the acronym CEC in the code text and Matrix Adoption Tables in parts with a Matrix Adoption Table. The applicable provisions are predominately in the California Energy Code, Part 6 of Title 24. Read Section 100 of the 2019 California Energy Code for more information and applications of CEC adoptions.

e. **Green Building Standards:** The Mobilehome Parks Act and Special Occupancy Parks Act within the Health and Safety Code, require HCD to promulgate building standards, and regulations other than building standards, for mobilehome parks and special occupancy parks. For permanent buildings in mobilehome and special occupancy parks that are other than Group R Occupancies, no provisions of the 2019 CALGreen (California Green Building Standards Code, Part 11, Title 24) have been adopted by HCD. Permanent buildings within these parks that are Group R Occupancies are subject to green standards adopted by HCD and identified in the code and Matrix Adoption Tables by the acronym HCD 1.

f. **Enforcement:** For mobilehome parks where local government has assumed enforcement jurisdiction pursuant to Health and Safety Code Section 18300, the local building department enforces building codes; otherwise the Department of Housing and Community Development is the enforcing entity.

   For special occupancy parks where local government has assumed enforcement jurisdiction pursuant to Health and Safety Code Section 18865, the local building department enforces building codes; otherwise the Department of Housing and Community Development is the enforcing entity.

   See Chapter 6 of this guide for more information about local enforcement responsibilities.

Note: *Above, we have referenced sections 1.8, 1.9, and others, of Chapter 1 of the 2019 California Building Code (Part 2 of Title 24). The same or similar information about the jurisdiction of the state agencies and application of adoptions by the state agencies is also available in the first chapter or article of the California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code and California Green Building Standards Code, as appropriate for those specific parts of Title 24.*

Requirements Based On Use or Type of Building or Facility

The following types of buildings and facilities are subject to specific adoptions as listed, in addition to the other code provisions applicable to the building occupancy.

1. **High Rise Buildings:** High rise buildings are subject to additional adoptions by the Office of the State Fire Marshal. Such adoptions are shown by the acronym SFM in the code text and Matrix Adoption Tables. Read Sections 1.11.1, 1.11.3 and 1.11.3.4 of the 2019 California Building Code (CBC, Part 2 of Title 24) and referenced state laws for more information.
2. **Essential Service Buildings:** Essential Service Buildings as defined in Section 16007 of the Health and Safety Code (HSC), such as a police or fire department facility, are subject to plan review and inspection by the local fire and building officials as set forth in HSC Division 12.5, Chapter 2, commencing with Section 16000, that makes reference to specific requirements within the California Administrative Code (CAC) and the California Building Code (CBC), Parts 1 and 2 of Title 24. State owned or state leased essential service buildings are subject to the structural requirements adopted by the Division of the State Architect and shown by the acronym DSA-SS. Enforcement of requirements applicable to state owned and state leased essential service buildings is performed by DSA. Read Section 1.9.2 of the 2019 CBC and Chapter 4 of the 2019 CAC, commencing with Section 4-201 for more information. See HSC Sections 16000 through 16022.

3. **Public Sidewalks:** Government Code Section 4450 directs the Division of the State Architect (DSA) to develop building standards for accessibility in public buildings, places of public accommodation, commercial facilities and publicly funded sidewalks and curbs. The building standards are located in Chapter 11B of the CBC. Such adoptions are shown by the acronym DSA-AC in the code text and Matrix Adoption Tables. Read Section 1.9.1 in Chapter 1, and Chapter 11B of the 2019 CBC, and Government Code Sections 4450 through 4453, and 4460 for more information.
4. **Local Detention Facilities:** Local detention facilities are subject to the additional adoptions by the Board of State and Community Corrections. Such adoptions are shown by the acronym BSCC in the code text and Matrix Adoption Tables. Read Section 1.3 of Chapter 1 in the 2019 CBC and referenced state laws for more information.
5. **Barbering, Cosmetology and Electrolysis Facilities:** Buildings with barbering, cosmetology and electrolysis facilities are subject to the additional adoptions by the Department of Consumer Affairs. Such adoptions are shown by the acronym CA in the code text and Matrix Adoption Tables. Read Section 1.4 of Chapter 1 in the 2019 CBC and referenced state laws for more information.
6. **Acupuncture, Pharmacies, Veterinary and Structural Pest Control:** Buildings with acupuncture, pharmacy, veterinary, or structural pest control facilities are subject to the additional adoptions by the Department of Consumer Affairs. Such adoptions are shown by the acronym CA in the code text and Matrix Adoption Tables. Read Section 1.4 of Chapter 1 in the 2019 CBC and referenced state laws for more information.
7. **Dairies, Meat and Poultry:** Buildings with dairy operations, or meat and poultry inspection facilities, are subject to the additional adoptions by the Department of Food and Agriculture. Such adoptions are shown by the acronym AGR in the code text and Matrix Adoption Tables. Read Section 1.6 of Chapter 1 in the 2019 CBC and referenced state laws for more information.
8. **Public Swimming Pools:** Public swimming pools are subject to the additional adoptions by the California Department of Public Health. Such adoptions are shown by the acronym DPH in the code text and Matrix Adoption Tables. Read Section 1.7 of the 2019 CBC and referenced state laws for more information.
9. **Food Handling:** Food establishments, shellfish facilities, and commissaries serving mobile food preparation vehicles are subject to the additional adoptions by the California Department of Public Health. Such adoptions are shown by the acronym DPH in the code text and Matrix Adoption Tables. Read Section 1.7 of the 2019 CBC and referenced state laws for more information.

10. **Animal Handling:** Laboratory animal quarters and wild animal quarantine facilities are subject to the additional adoptions by the California Department of Public Health. Such adoptions are shown by the acronym DPH in the code text and Matrix Adoption Tables. Read Section 1.7 of the 2019 CBC and referenced state laws for more information.
11. **Organized Camps:** Organized camps are subject to the additional adoptions by the California Department of Public Health and the Office of the State Fire Marshal. Such adoptions are shown by the acronyms DPH and SFM in the code text and Matrix Adoption Tables. Read Sections 1.7 and 1.11.1 of Chapter 1 in the 2019 CBC and referenced state laws for more information.
12. **Radiation Protection and Producing Facilities:** Radiation Protection and Producing Facilities are subject to the additional adoptions by the California Department of Public Health. Such adoptions are shown by the acronym DPH in the code text and Matrix Adoption Tables. Read Section 1.7 of the 2019 CBC and referenced state laws for more information.
13. **State Libraries:** Buildings of the public library system constructed or renovated using funds from the California Library Construction and Renovation Bond Act of 1988 are subject to the additional adoptions by the State Librarian. Such adoptions are shown by the acronym SL in the code text and Matrix Adoption Tables. Read Section 1.12 of Chapter 1 in the 2019 CBC and referenced state laws for more information.
14. **Marine Oil Terminals:** Marine oil terminals are subject to the additional adoptions by the California State Lands Commission. Such adoptions are shown by the acronym SLC in the code text and Matrix Adoption Tables. Read Section 1.14 of Chapter 1 in the 2019 CBC and referenced state laws for more information.
15. **Family Care Homes and Facilities, Motion Picture Studios and State Institutions:** Small and large family daycare homes, residential facilities, residential facilities for the elderly, residential care facilities, motion picture production studios and any state institutions or other state owned or state occupied building are subject to the additional adoptions by the Office of the State Fire Marshal. Such adoptions are shown by the acronym SFM in the code text and Matrix Adoption Tables. Read Section 1.11.1 of Chapter 1 in the 2019 CBC and referenced state laws for more information.
16. **Tents, Awnings or Other Fabric Enclosures:** Tents, awnings and other fabric enclosures are subject to the additional adoptions by the Office of the State Fire Marshal. Such adoptions are shown by the acronym SFM in the code text and Matrix Adoption Tables. Read Section 1.11.1 of Chapter 1 in the 2019 CBC and referenced state laws for more information.

17. **Recycled Water Systems:** Installation, construction, alteration, or repair of recycled water systems for water closets, urinals, trap primers, floor sinks and other acceptable uses are subject to the additional adoptions by the Department of Water Resources. Such adoptions are shown by the acronym DWR in the code text and Matrix Adoption Tables. Read Section 1.13.0 of Chapter 1 in the 2019 California Plumbing Code and referenced state laws for more information.

Examples of Code Application by Type of Building, Occupancy, or Feature

The types of buildings and occupancies shown are selected to illustrate that multiple state agencies may have adoptions applicable to a single type building.

This table is for training purposes only and is not a substitute for the code. In case of conflict, the code shall prevail. Code exceptions are not shown.

Type Building, Occupancy or Feature	Subject	State Law	State Adopting Agency	Enforcement Agency
Hotels, Motels, Lodging Houses	Structural, Mechanical, Electrical, Plumbing	State Housing Law HSC Division 13, Part 1.5, Sec 17921(a) & 17922	HCD 1	Local Government, or HCD, when there is no local agency
	Fire & Panic Safety	HSC 17921(b)	SFM	
	Accessibility	HSC 19952-19959	DSA-AC (1)	
	Energy Conservation	PRC 25402	CEC (2)	
	Green Building Standards	HSC 17921(a) & 17922	HCD 1	
Apartments and Condominiums (not public housing)	Structural, Mechanical, Electrical, Plumbing	HSC 17921(a) & 17922	HCD 1	Local Government or HCD, when there is no local agency
	Fire & Panic Safety	HSC 17921(b)	SFM	
	Accessibility	GC 12955.1	HCD 1-AC (4)	
	Energy Conservation	PRC 25402	CEC (2)	
	Green Building Standards	HSC 17921(a) & 17922	HCD 1	

Type Building, Occupancy or Feature	Subject	State Law	State Adopting Agency	Enforcement Agency
One- & Two-Family Dwellings (not public housing)	Structural, Mechanical, Electrical, Plumbing	HSC 17921(a) & 17922	HCD 1	Local Government or HCD, when there is no local agency
	Fire & Panic Safety	HSC 17921(b)	SFM	
	Accessibility	None	None (4)	
	Energy Conservation	PRC 25402	CEC (2)	
	Green Building Standards	HSC 17921(a) & 17922	HCD 1	
Group A, B, M and other occupancies	Structural, Mechanical, Electrical, Plumbing	HSC 18938	BSC (5)	Local Government
	Fire & Panic Safety	HSC 13143	SFM	
	Accessibility	HSC 19952-19959	DSA-AC	
	Energy Conservation	PRC 25402	CEC (2)	
	Green Building Standards	HSC18930.5 & 18938	BSC-CG	
Hospitals & Medical Care Facilities	Structural, Mechanical, Electrical, Plumbing	HSC Div.107, Parts 1 & 7	OSHPD 1, 1R, 2 or 4	OSHPD
	Fire & Panic Safety	HSC 13143	SFM	
	Accessibility	HSC 19952-19959	DSA-AC	
	Energy Conservation	PRC 25402	CEC	
	Green Building Standards	HSC 1275 &129850	OSHPD 1, 2 or 4	

Type Building, Occupancy or Feature	Subject	State Law	State Adopting Agency	Enforcement Agency
Licensed Clinics	Structural, Mechanical, Electrical, Plumbing	HSC Div.107, Part 1 &7	OSHPD 3	Local Government
	Fire & Panic Safety	HSC 13143	SFM	
	Accessibility	HSC 19952-19959	DSA-AC	
	Energy Conservation	PRC 25402	CEC	
	Green Building Standards	HSC 18930.5 & 18938	None (6)	
Public Schools (K-12 & Community Colleges)	Structural, Mechanical, Electrical, Plumbing	EC 17310, 81142, 81053	DSA-SS/CC	DSA
	Fire & Panic Safety	HSC 13143	SFM	
	Accessibility	HSC 19952-19959	DSA-AC	
	Energy Conservation	PRC 25402	CEC	
	Green Building Standards	EC 17310, 81142, 81053	DSA-SS/CC	

Table Notes:

1. Exception: Lodging houses meeting the definition of covered multifamily dwelling are subject to HCD 1-AC. See Sections 1.8.2.1.2 and 1101A.1 and 1102A.1 in Chapter 11A of the 2019 California Building Code.
2. See Title 24, Part 6, Section 100 for listing of occupancies subject to CEC adoptions.
3. Applicable only to buildings meeting the definition of covered multifamily dwelling. See Sections 1.8.2.1.2 and 1101A.1 and 1102A in Chapter 11A of the 2019 California Building Code (CBC). Public use areas are subject to DSA-AC adoptions in CBC Chapter 11B. See CBC Section 1101A.1 for scoping.
4. If publicly funded, then DSA-AC adoptions apply.
5. When no state agency has authority to adopt specific requirements, apply the published Title 24 provisions applicable to the occupancy and structure.
6. Local government may enact more restrictive green building standards.

Additional Notes:

7. See Section 1.2 through 1.14 of 2019 California Building Code for complete discussion on application of adoptions by state agencies.
8. Acronyms used above:

   BSC- California Building Standards Commission
   EC- Education Code
   HSC- Health and Safety Code
   GC- Government Code
   PRC- Public Resources Code

   State Agency Acronyms as discussed in Chapter 3.

Chapter 5. State and Local Code Adoption

In this chapter we will explain the code adoption process used to create Title 24, and how local government is to adopt and enforce Title 24. You may wish to review the Glossary of Terms in Chapter 7 to familiarize yourself with words and terms related to code adoption.

The State Rulemaking Process for Building Standards

The process of adopting building standards is governed by requirements in the California Building Standards Law in Health and Safety Code (HSC), Division 13, Part 2.5, commencing with Section 18901, the Administrative Procedure Act (Government Code, commencing with Section 11340), and Chapter 1 of the California Administrative Code, Part 1 of the California Building Standards Code, Title 24 of the California Code of Regulations. The California Building Standards Commission (CBSC) is responsible for carrying out the code adoption process in accordance with these identified state laws and regulations.

CBSC is established by and functions pursuant to the California Building Standards Law (HSC, Division 13, Part 2.5). CBSC coordinates the building standards adoption activities of the state agencies, makes the proposed code adoptions available to the public via the California Regulatory Notice Register and CBSC's website), conducts public meetings, and approves for adoption those proposed building standards found to meet requirements of the law. CBSC publishes the adopted building standards that are approved for inclusion in Title 24, along with adopted model codes. The state agencies that participate in this process are called proposing agencies.

Other state agencies, called adopting agencies, conduct their own public hearings and submit their adopted building standards to CBSC for approval by the commissioners and publication in Title 24. CBSC's review and approval of adopting agency submittals endure that they have met the requirements of law for regulatory adoptions. Two examples of adopting agencies are the California Energy Commission (CEC) and the State Historical Building Safety Board (SHBSB), responsible for Parts 6 and 8 of Title 24 respectively.

Parts 2, 2.5, 3, 4, 5, 9 and 10 of Title 24 are based on model codes. Every three years, the private code development organizations issue new editions of their respective model codes. When the new model code editions are published, CBSC and 14 state agencies (listed on page 12) begin an adoption process called the Triennial Code Adoption Cycle. During this cycle, the state agencies must review the new editions of the model codes and prepare rulemaking files with required documents, such as a Notice of Proposed Action (NOPA), Express Terms (ET) and Initial Statement of Reasons (ISOR), proposing the adoption of the new edition of model codes with

necessary modifications to incorporate state and federal laws and regulations, and to remove conflicts. The modifications are known as California Amendments.

CBSC convenes its Coordinating Council to coordinate the rulemaking work of the 14 state agencies. Considerable organization is necessary because the state agencies each have specific areas of authority. The initial rulemaking files developed by the state proposing agencies are submitted to CBSC which then assembles Code Advisory Committees (CAC) to assist with review of the proposed building standards. The state agencies make amendments as needed to address comments and recommendations from the CACs.

Next, a NOPA is issued to advise the public of the proposal subject and provide information regarding the minimum 45-day public comment period and public meeting. The rulemaking documents such as the ET and ISOR are made available to the public via CBSC's website and the website of the state agency proposing the regulatory action.

Often, the comments received during a public comment period result in the need to modify the proposed code language. When this occurs, CBSC posts an amended NOPA, ET and ISOR on its website and accepts additional public comment during another public comment period. When a substantive code language change is needed, or the change is not sufficiently related to the original NOPA, this second public comment period must be for at least 45 days. If the code language modifications are nonsubstantial or solely grammatical in nature, and are sufficiently related to the original NOPA, a minimum 15-day public comment period is allowed.

Following the public comment period(s), a public meeting is held at which the CBSC commissioners hear public testimony, and consider the CACs' comments and written comments received from the public. They then vote to approve, disapprove, approve as amended, or return for further study the proposed building standards.

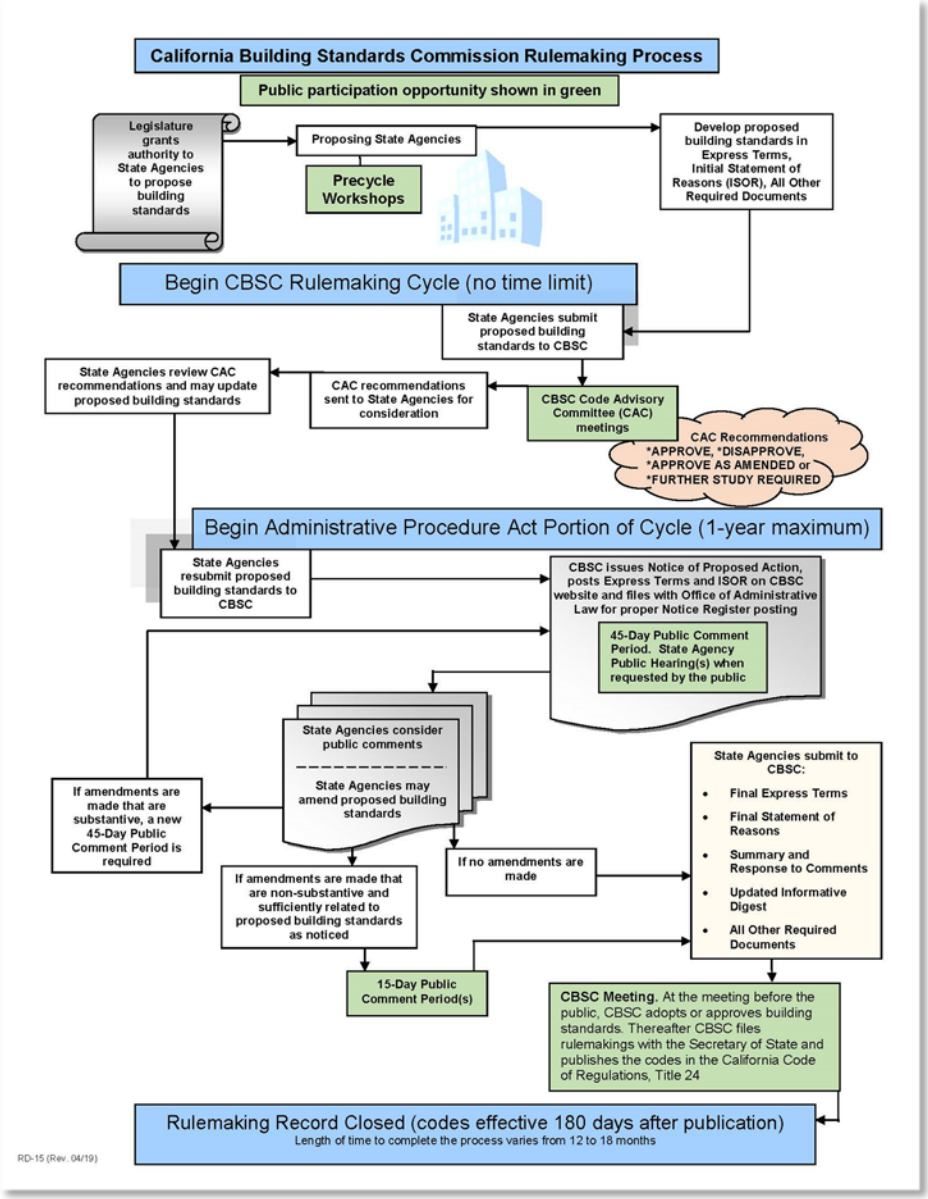
The entire adoption process requires about 18 months to complete. When the adoption process is complete, the model code language along with the California Amendments is published in the California Building Standards Code, Title 24, California Code of Regulations (CCR). The effective date for new adoptions in Title 24 is no sooner than 180 days following the publication date established by CBSC's commissioners. This minimum 180-day period is required by HSC Section 18938 to allow local government and those subject to the codes time to adjust processes and designs, or to obtain or provide training. Occasionally, CBSC has established an effective date greater than 180 days after publication.

The result of the Triennial Code Adoption Cycle is the publication of a new edition of Title 24 in new binders. Prior to January 1, 2011, CBSC conducted an Annual Code Adoption Cycle each year between the triennial cycles. The annual cycle was the same process as the triennial cycle, except that there was no new model code. The California Building Standards Law in the Health and Safety Code was amended by

Assembly Bill 1693 (Chapter 145, Statutes of 2010) to eliminate the annual code adoption cycle on and after January 1, 2011. Now, an Intervening Code Adoption Cycle is conducted between the Triennial Code Adoption Cycles to consider proposed modifications to the current Title 24 edition, including new regulatory language, edits, and repeals. The intervening cycle adoptions result in the issuance of supplement pages to be inserted into the current edition of Title 24. See the section about maintaining your copy of Title 24 beginning on page 22 of this guide for more about supplements.

Note: More details about the code adoption process is contained in CBSC's publication, *A Public Guide to the Building Standards Adoption Process*, found on the Resources tab of our website.

Below is an illustration of CBSC's code adoption process for building standards.



Local Code Adoption

State law requires local government to enforce the California Building Standards Code (Title 24, CCR) through a local building department and/or fire district, as it applies to buildings constructed, repaired, altered, and added to, that are not subject to state agency enforcement (such as public schools and hospital buildings). The majority of local governments adopt the published Title 24 by reference in their ordinances. This is commonly called an adoption ordinance. Title 24 applies throughout the state and to all buildings and occupancies, whether or not the local government has an adoption ordinance. This is made clear in Health and Safety Code (HSC) Section 18938 and in Section 1.1.3 of Chapter 1 in the 2019 California Building Code (Part 2 of Title 24).

Local government is permitted by state law in HSC Section 18941.5 to adopt local ordinances making more restrictive requirements than in Title 24, as reasonably necessary because of local climatic, geological, or topographical conditions. Additionally, the State Housing Law in HSC Section 17958.5 allows local amendments to Title 24 requirements applicable to the construction of single- and multiple-family dwellings, hotels, motels and lodging houses.

Health and Safety Code Section 18941.5 (in part and with emphasis added)

> *(b) Neither the State Building Standards Law contained in this part, nor the application of building standards contained in this section, shall limit the authority of a city, county, or city and county to establish* ***more restrictive building standards, including, but not limited to, green building standards, reasonably necessary because of local climatic, geological, or topographical conditions****. The governing body shall make the finding required by Section 17958.7and the other requirements imposed by Section 17958.7 shall apply to that finding. Nothing in this section shall limit the authority of fire protection districts pursuant to subdivision (a) of Section 13869.7.*

Health and Safety Code Section 17958.5 (in part and with emphasis added)

> *(a) Except as provided in Section 17922.6, in adopting the ordinances or regulations pursuant to Section 17958, a city or county may make such changes or modifications in the requirements contained in the provisions published in the California Building Standards Code and the other regulations adopted pursuant to Section 17922 as it determines, pursuant to the provisions of Section 17958.7, are* ***reasonably necessary because of local climatic, geological, or topographical conditions****. For purposes of this subdivision, a city and county may make reasonably necessary modifications to the requirements, adopted pursuant to Section 17922, contained in the provisions of the code and regulations on the basis of local conditions.*
>
> **Explanation:** Section 17922.6 referenced in the section above, is state law requiring noise insulation. Local government may not amend the noise insulation standards adopted by state agencies into Title 24.

A local government exercising the authority provided in HSC Sections 18941.5 and 17958.5 to adopt more restrictive requirements must make an express (written) finding of need as required by HSC Section 17958.7. The express finding of need explains the local climatic, geological or topographical conditions that make it necessary to implement more restrictive requirements.

HSC Sections 13143.5 and 13869.7 authorize local ordinances with fire and panic safety requirements more restrictive than those in Title 24 adopted by the Office of the State Fire Marshal (SFM). Any local ordinance establishing more restrictive fire and panic safety requirements must be limited only to those needed for local climatic, geological, or topographical conditions. However, HSC Sections 13143.5(b) and (c) authorize local government to make different requirements for fire sprinkler systems. Additionally, local government may also adopt more restrictive fire and panic safety requirements to be enforced by the local fire protection district.

Local amendments to Title 24 by a city, county, or city and county are neither effective nor operative until copies of both the ordinance and express finding of need are filed with CBSC (see HSC Section 17958.7).

Local amendments to Title 24 by a local fire protection district are not operative until ratified by the city, county, or city and county where the ordinance will apply and copies of the ordinance and finding of need are filed with the Department of Housing and Community Development (see Health and Safety Code Section 13869.7).

Local amendment to Title 24 by a city, county, or city and county that apply to qualified historical buildings must be filed with the State Historical Building Safety Board.

Local building and fire district officials are urged to review our *Guide for Local Amendments of Building Standards* available on CBSC's website. It explains the requirements of state law for amendment documents and filing requirements. Specific mailing addresses for the state agencies are provided as well.

Chapter 6. Enforcement

Cities, counties and a city and county are required by state law to enforce the California Building Standards Code published in Title 24 of the California Code of Regulations as it applies to buildings not subject to enforcement by state agencies. The California Building Code (Part 2 of Title 24) Chapter 1, Sections 1.2 through 1.14 provides information as to the enforcement responsibilities for various types of buildings, uses and features. Where these sections of law identify local government with enforcement responsibility, refer to the following state laws.

Descriptions are abridged.

- Health and Safety Code (HSC) Sections 13145, 13146 and 13196 require the local fire official to enforce Title 24 provisions shown adopted by the State Fire Marshal (SFM).
- HSC Section 13869.7 authorizes a fire protection district to adopt local amendments to building standards within Title 24 shown adopted by SFM. Subsection (h)(1) requires a city, county, or city and county that ratifies an ordinance by a fire protection district relating to fire and panic safety to delegate the enforcement of the ordinance to either the chief of the fire protection district that adopted the ordinance, or the chief building official of the city, county, or city and county.
- HSC Section 17958 (State Housing Law) establishes that Title 24 is the applicable code when a city or county does not specifically adopt Title 24 by ordinance, or adopt modifications to the Title 24 provisions as authorized by this and other provisions of the HSC.
- HSC Section 17960 (State Housing Law) requires every city and county to enforce Title 24.
- HSC Section 18938(b) (California Building Standards Law) establishes that Title 24 shall apply to all occupancies throughout the state and shall become effective 180 days after publication by the California Building Standards Commission or at a later date after publication established by the commission.
- HSC Section 18948 (California Building Standards Law) reads, “the responsibility for the enforcement and administration of building standards shall remain in the state or local agency specified by other provisions of law.”

  Note: The state laws being identified in this discussion are those “other laws”.
- HSC Section 18959 requires local government to administer and enforce the California Historical Building Code (Part 8 of Title 24).

- HSC Section 19958 requires the building department of every city and county to enforce the building standards for accessibility in buildings and related facilities as published in Title 24.
- Government Code Section 4453(b), within Title 1, Division 5, Chapter 7 requires the Division of the State Architect to develop the accessibility building standards for publication in Title 24 with applicability to publicly funded buildings to enforce the chapter. The enforcement extends to building standards.
- Civil Code Section 55.53(d) requires a local agency (building department) shall employ or retain a sufficient number of building inspectors who are certified access specialists (CASp). Persons having the CASp designation are to conduct permitting and plan check services to review for compliance with state construction-related accessibility standards with respect to new construction, including projects relating to tenant improvements that may impact access. If a local agency employs or retains two or more CASps to comply with this subdivision, at least one-half of the CASps shall be building inspectors who are CASps.
- Public Resources Code Section 25402.1(g) requires the building department of every city, county, and city and county to enforce the building standards for energy conservation adopted by the California Energy Commission. The standards are published in The California Energy Code, Part 6 of Title 24.

Criminal Penalties

State law establishes criminal and civil penalties for violating some provisions of the California Building Standards Code in Title 24 of the CCR. The various state laws that charge specific state agencies with the responsibility of developing Title 24 provisions for adoption or publication by the California Building Standards Commission also establish criminal and civil penalties for violations of the law or the building standards adopted to implement that law. Caution is needed, however. It is necessary to be sure that the state law establishing a penalty is the same state law authorizing the specific building standard being violated. All state laws referenced herein are available to read and print at the California Legislative Information website.

Following are explanations and examples of some criminal penalties provided in state law regarding building standards. These examples are not a complete listing of all criminal penalties available in state law for violation of the building codes.

1. **State Housing Law:** Health and Safety Code (HSC), Division 13, Part 1.5 commencing with Section 17910, known as the State Housing Law (SHL), charges the Department of Housing and Community Development with the task of developing Title 24 provisions (excluding fire and panic safety) applicable to

the construction of hotels, motels, lodging houses, apartments and dwellings. Section 17995 within the SHL establishes penalties for violation of the SHL and Title 24 provisions adopted under the authority of and to implement the SHL. HSC Section 17995 reads (with clarification added):

> "*Any person who violates any of the provisions of this part* **(the word "part" is referring to Part 1.5 of Division 13 in the HSC)***, the building standards published in the State Building Standards Code relating to the provisions of this part, or any other rule or regulation promulgated pursuant to the provisions of this part is guilty of a misdemeanor, punishable by a fine not exceeding one thousand dollars ($1,000) or by imprisonment not exceeding six months, or by both such fine and imprisonment."*

Accordingly, any violation of Title 24 shown as an HCD 1 adoption in the Matrix Adoption Tables is punishable as a misdemeanor.

It is noteworthy that Section 17995 language does not include the words "willfully" or "knowingly." Sometimes, a law that establishes a criminal penalty will specify that a person is guilty of the crime only if the violation is willful or knowingly allowed to exist. Here, a person may be found guilty under Section 17995 without willfulness or knowledge of the violation, so the burden of proof on the plaintiff is less.

The SHL also charges the State Fire Marshal (SFM) with the responsibility of developing Title 24 provisions relating to fire and panic safety in hotels, motels, lodging houses, apartments and dwellings. A violation of any Title 24 provision shown as adopted by SFM that is implementing the SHL is punishable under HSC Section 17995 (shown above) as a misdemeanor.

2. **Fire Protection Laws:** HSC Division 12, Part 2, Chapter 1, establishes the responsibility for the SFM to develop building standards for fire alarms, egress systems, and public address system backup in specific buildings and for buildings located in hazardous fire areas and or urban wildland interface areas. HSC Section 13112 provides for misdemeanor convictions and reads as follows:

   > *"Every person who violates any provision of this chapter, or any order, rule, or regulation made pursuant to this chapter, is guilty of a misdemeanor punishable by a fine of not less than one hundred dollars ($100) or more than five hundred dollars ($500), or by imprisonment for not more than six months, or by both. A person is guilty of a separate offense each day during which he or she commits, continues, or permits a violation of any provision of, or any order, rule, or regulation made pursuant to, this chapter."*

   Thus, a violation of a provision of Title 24 shown as adopted under SFM is punishable as a misdemeanor.

Remember that the application of penalties is generally limited to violations of that segment of law (Division, Part, Chapter, etc.) where the penalties are established.

Further, the penalties are limited to violations of the building standards adopted to implement that segment of law. There are building standards within Title 24 that are implementing state laws that do not provide for criminal penalties. Some laws provide for only injunctive relief, or civil penalties and not criminal penalties.

For additional information regarding criminal penalties for violations of Title 24, read HSC Sections 13199, 13190.4, 18700, and 19997.

Civil Penalties and Injunctions

Following are examples of civil penalties and injunctive relief provided in state law. These examples are not a complete listing of all civil penalties and injunctive relief available in state law for violation of the building codes.

1. **Government Code Sections 4450 through 4461** establish that publicly funded buildings, sidewalks and housing, must provide for accessibility as required by regulations promulgated by the Division of the State Architect (DSA). Such regulations, or building standards, are found primarily in California Building Code Chapter 11B (Title 24, Part 2).
2. **Health and Safety Code Sections 19953 and 19954** authorize any person who is aggrieved or potentially aggrieved by a violation of accessibility provisions, or the district attorney, city attorney, county counsel or the Attorney General, may bring an action to enjoin any violations of the accessibility provisions provided by the Health and Safety Code or Title 24. **HSC Section 19955** establishes that places of public accommodations (in short, privately owned buildings open to the public) must be designed and constructed to provide for accessibility. **HSC Section 19958.6** establishes that a person who violates Section 19955 (and other sections) or *"any of the regulations that have been promulgated by the State Architect pursuant to Section 4450 of the Government Code and approved by the California Building Standards Commission shall be subject to a civil penalty of two thousand five hundred dollars ($2,500) for each violation."*
3. **Government Code Section 12955.1(a)** reads in part, *"For purposes of Section 12955, 'discrimination' includes, but is not limited to, a failure to design and construct a covered multifamily dwelling in a manner that allows access to, and use by, disabled persons."* Government Code Section 12955 makes it unlawful to discriminate in housing sales, rent or lease, based on disabilities. **Government Code Section 12980** provides that civil actions may be brought in the court of competent jurisdiction by the Department of Fair Employment and Housing for violations of Government Code Sections 12955, 12955.1 and 12955.7. A civil action may also be brought by any person aggrieved by violations under **Government Code Section 12989.1**. The courts may sanction violators with civil penalties.

4. **California Civil Code Section 54.3** establishes civil penalties for each violation of a person's rights under Civil Code Sections 54, 54.1 and 54.2, which can include a violation of building standards requiring accessibility in places of public accommodation and housing accommodation. The code violation constitutes an act of discrimination. The amount of the civil penalty is determined by a jury, or the court sitting without a jury, up to a maximum of three times the amount of actual damages but in no case less than one thousand dollars ($1,000), and attorney fees.

For additional information regarding civil remedies (other than criminal penalties) for violations of building laws, read HSC Sections 13250, 19953, 19954, 19958.5 and 19958.6, Government Code Sections 12956.2, 12980, 12981 and 12987, and Civil Code Sections 54, 54.1, 54.2, 55 and 55.1. Access these codes at the California Legislative Information website.

Chapter 7. Glossary of Terms

There are many words, terms, names and phrases associated with the California Building Standards Code and the work to propose, adopt, approve, publish and enforce it. This document will explain many of those words, names and phrases. In many cases while defining one word it is necessary to use another word that also needs an explanation. In these cases, we have italicized words that are defined elsewhere in this document.

We have provided references to state laws where a definition or related information is available. Access state laws at the California Legislative Information website at www.leginfo.legislature.ca.gov/faces/codes.

There are also references to materials available at the California Building Standards Commission (CBSC) website at www.dgs.ca.gov/bsc.

Administrative Procedure Act (APA): The name given to the portion of state law in California Government Code, Title 2, Chapters 3.5, 4 and 5, commencing with Section 11340. This body of law establishes procedures for state agencies, including the process for the adoption of regulations. The *California Building Standards Law (Health and Safety* Code Section 18901, et cetera) which governs the process for adopting *building standards* for *publication* in Title 24, *California Code of Regulations*, makes reference to several requirements of the APA.

Adoption or Adopt (Adopted): Adoption or adopt means, with respect to the procedure for promulgation of a building standard, the final act of a state agency that has the legislative authority and responsibility to take proposed building standards to public hearing. In short, the term refers to the official ruling of the *California Building Standards Commission* to *approve* a proposed building standard for publication in Title 24 of the California Code of Regulations. A code provision that has been adopted may not yet be *published* or effective. See the definitions for *publication date and publication,* and *effective date*.

Approval (Approve): Approval means, with respect to the procedure for promulgation of a building standard, the action of approval by the *California Building Standards*

Commission. Until there is approval of the standard by the commission, it shall be a proposed *building standard* or regulation.

Bagley-Keene Open Meeting Act: This Act, located in the *Government Code*, generally requires state boards and commissions to publicly notice its meetings, prepare agendas, accept public testimony and conduct its meetings in public unless specifically authorized by the Act to meet in closed session.

> **Note:** The Department of Consumer Affairs (DCA) – Legal Affairs Division published a guidebook titled "Guide to The Bagley-Keene Open Meeting Act" and that is available on the DCA website at www.dca.ca.gov/publications/bagleykeene_meetingact.pdf. Please note that this guide may or may not have been updated with changes to the law. We recommend verifying these provisions of the *Government Code* at the California Legislative Information website at leginfo.legislature.ca.gov/faces/home and select the California Law tab. The applicable sections of *Government Code* are 11120 through 11132.

Building Standards: The legal definition of building standard is provided in *Health and Safety Code* Section 18909. In short, a building standard is a *state regulation* placed in Title 24 of the *California Code of Regulations* when *adopted* or *approved* by the *California Building Standards Commission*. Building standards establish requirements for the design and construction of buildings and related facilities and equipment, and may include administrative requirements that implement or enforce building standards.

California Administrative Code: The former name of the *California Code of Regulations*. This name was changed by legislation in 1992, but the name continues in some official documents. This is not to be confused with Part 1 of *Title 24* which has the same name.

California Amendment: Sometimes called a state amendment. It is an amendment, deletion or addition to the language of an *adopted model code* in *Title 24* of the *California Code of Regulations*. A California amendment is developed by a *state adopting agency* or *state proposing agency* and determined necessary to implement a requirement of state or federal law or regulations that are not provided in the *adopted*

model code, or to remove conflicts in *model codes* with state or federal laws or regulations, or another *adopted model code*.

Further, a California amendment may be in the form of completely new code language within an *adopted model code*. For example, Chapters 7A, 11A, 11B and 31F of the *California Building Code* (Part 2 of Title 24), are California amendments in their entirety. California amendments are identified by *italic* font print in the code text of *Title 24*. There are exceptions to the use of italic font print, however. Some model codes also use *italic* font print for special notes and identifiers.

California Building Standards Code: The name established by *Health and Safety Code* Section 18902 for *Title 24* of the *California Code of Regulations*. *Title 24* contains *building standards* in 13 parts (within 11 binders) published by the *California Building Standards Commission*. The *building standards* in the California Building Standards Code are *state regulations* developed by various state agencies within the executive branch of state government. State laws require various state agencies to develop *building standards* for specific types of buildings, building equipment and features.

> **Note:** Part 7 of *Title 24* is currently vacant. Part 7 previously contained the elevator safety construction requirements which are now located in Title 8 of the *California Code of Regulations.*

California Building Standards Commission (CBSC): The state government entity designated by *statute* to oversee the development of *building standards* and to *publish*, or cause to be published, the California Building Standards Code in *Title 24* of the *California Code of Regulations*. The California Building Standards Commission operates under the authority established by *Health and Safety Code*, Division 13, Part 2.5, known as *California Building Standards Law*. The abbreviation CBSC or BSC is often used to identify the *California Building Standards Commission*. CBSC is comprised of a total of 11 commissioners. Of these members, 10 are appointed as commissioners by the governor and are subject to the California Senate's approval. Each seat is designated for a specific profession or area of interest as prescribed by *Health and Safety Code* Section 18921. The Secretary of Government Operations

agency is designated to serve as the commission chair as prescribed by Health and Safety Code Section 18922 and completes the 11 membered commission.

California Building Standards Law: This name refers to the body of state law within *Health and Safety Code*, Division 13, Part 2.5, commencing with Section 18901. The provisions of Part 2.5 govern the work and responsibilities of the *California Building Standards Commission* (CBSC) and how the *building standards* in *Title 24* are *adopted* and *approved*, and published by CBSC, and how the provisions apply.

California Code of Regulations: The name of the official regulations promulgated by the agencies of the executive branch of state government for the purpose of implementing, interpreting and carrying out the intent of state law. The *California Code of Regulations* is divided into 28 separate titles, Title 1, 2, 3,…24...etc. Each title is given a name as well. The abbreviation CCR is often used to identify the *California Code of Regulations*. The CCR is available online at the website of the Office of the Administrative Law at www.oal.ca.gov.

California Regulatory Notice Register: A state government publication containing notices of proposed regulatory actions by state regulatory agencies to adopt, amend, or repeal regulations contained in the *California Code of Regulations*. This document is available on the Office of Administrative Law's Regulatory Notice Register website at oal.ca.gov/publications/notice_register. When building standards for *Title 24* are proposed, a notice is placed in the California Regulatory Notice Register in addition to being available on the California Building Standards Commission's website.

California Standard: Commonly understood to be a building standard developed by the *state proposing agency* or *state adopting agency* that is not an amendment to a *model code* provision. Parts 1, 6, 8,11 and 12 of Title 24 are not based on a *model code* as are *California Amendments* discussed above. The contents of these parts are developed by the *state proposing agencies* or *state adopting agencies* and are commonly referred to as California Standards. Upright font print is used in Parts 1, 6, 8,11 and 12 and no italic text is used to indicate a *California Amendment*.

Change Without Regulatory Effect (CWoRE): Is a change to the provisions of *Title 24* that does not impose any new requirement for the design or construction of

buildings and associated structures and equipment. A change without regulatory effect may include but is not limited to, renumbering or reordering of sections, deletion of a regulatory provision for which statutory or constitutional authority was repealed or was held invalid in a judgement, revising the structure, syntax, cross-reference, grammar or punctuation, or changing authority or reference. When *adopted* or *approved* by the *California Building Standards Commission*, the change becomes effective 30 days after filing with the Secretary of State.

Civil Code: One of the 29 codes that make up California state law enacted through California's legislative process. There are provisions in the Civil Code that establish *civil penalties* for violations of *Title 24* relating to accessibility.

Civil Penalty: A civil penalty results from a civil trial, resulting in an order of the court to pay monetary penalties to a governmental entity, firm or the individual bringing the civil action. There is no arrest warrant, arrest or criminal record. A civil suit is filed with the court having jurisdiction that alleges a violation of law that provides for the award of a civil penalty when violated. A civil trial is conducted to determine if the person named in the civil suit is in fact violating the law and is therefore liable to pay civil penalties.

Code Adoption Cycle: See *Triennial Code Adoption Cycle* and *Intervening Code Adoption Cycle.*

Code Advisory Committee(s): Commonly abbreviated as CAC. *Health and Safety* Code Section 18927 authorizes the *California Building Standards Commission (CBSC)* to establish advisory panels (or committees) of experts and the general public to assist *CBSC* in carrying out its responsibilities. Six standing code advisory committees have been established:

- Accessibility
- Building, Fire and Other
- Green Building
- Health Facilities
- Plumbing, Electrical, Mechanical and Energy
- Structural Design/Lateral Forces

These committees meet at the request of *CBSC* to review and provide written comments to *CBSC* on proposed *building standards* for *Title 24*. The comments are advisory and are not binding on the *CBSC commissioners* or state proposing agencies. The members of the committees are selected by the commissioners at the onset of each *triennial code adoption cycle* for their expertise and for a balance of interests. The names of the current members of the code advisory committees are available on *CBSC's* website.

Note: Ad-hoc code advisory committees may be established by *CBSC* on an as-needed basis.

Coordinating Council: A council of representatives of *state proposing agencies* and *state adopting agencies* established and staffed according to *Health and Safety Code* Section 18926. The membership of the council consists of the executive director for the *California Building Standards Commission*, who serves as chairperson, and representatives appointed by the Director of the Department of Public Health, the Director of the Office of Statewide Health Planning and Development, the Director of the Department of Housing and Community Development, the State Fire Marshal, the Executive Director of the State Energy Resources Conservation and Development Commission (Energy Commission), and the Director of the Department of General Services. The primary purpose for the coordinating council is to:

- Ensure coordination between the agencies in the proposal of building standards
- Assist in the development of building standards
- Resolve conflicting building standards

Criminal Penalty: A criminal penalty is the result of a conviction of a crime punishable by imprisonment or a monetary fine, or both. Criminal penalties are categorized as an infraction (least serious), misdemeanor (less serious than felony), or a felony (most serious). Except for infractions, an arrest warrant is issued by the State Attorney General or more often by the local district attorney. An arrest and trial is included in the due process to determine guilt. If guilt is established, the judge of the court determines the penalty as provided by law. A criminal record is established for the person(s) found guilty. There are state laws establishing misdemeanor penalties for violation of some provisions of *Title 24*.

Effective Date: The date a *building standard* in *Title 24* becomes effective. This may be no sooner than 180 days following the *publication date* unless the building standard is administrative, an *emergency building standard* or *change without regulatory effect* (CWoRE). Both the *publication date* and the *effective date* are established by the *CBSC commissioners*. See *Publication Date* and *Publication.*

Emergency Building Standards: The *Health and Safety Code* authorizes the *California Building Standards Commission* (CBSC) to adopt emergency building standards when a situation develops that requires an immediate regulatory solution in order to preserve the health and safety or general welfare of the public. Emergency building standards differ from those building standards *adopted* through an *intervening* or *triennial code adoption cycle* because the emergency building standard becomes effective immediately upon *approval* by *CBSC* and filing with the Secretary of State, or at any future effective date established by the *CBSC commissioners*. Emergency building standards are effective for up to 180 days, and can be readopted for no more than two 90-day periods under specific circumstances. For emergency building standards to become permanent in *Title 24, CBSC* must provide the public a *Notice of Proposed Action, Express Terms* and *Initial Statement of Reasons*, and conduct a 45-day *public comment period*, and a *public hearing*, when so requested. That process is much like the normal *adoption* process, except that the process takes place after the *approval* of the emergency building standards. Emergency building standards *adoption for Title 24* is not a common event.

For additional information regarding emergency building standards refer to *Health and Safety Code* Sections 18937 and 18938(d), *Government Code Sections* 11346.1 and 11349.6 and *California Code of Regulations, Title 24, California Building Standards Code,* Part 1, *California* Administrative Code, Chapter 1, Section 1-419.

Enjoin, Injunction or Injunctive Relief: A person who is enjoined has been ordered in an injunction issued by a court to stop an unlawful practice. An injunction is an order of the appropriate court directing a person, firm or entity to stop a practice that violates a law, or a regulation implementing law. Some laws allow the State Attorney General, local district attorney, or a firm, entity or person to seek an injunction to enjoin a firm,

entity or person believed to be violating a law. There are state laws establishing authority to enjoin a person violating specific provisions of *Title 24.*

Errata: A correction page or pages to *Title 24* without regulatory effect. Issued to correct a typing or printing error made in the code language. It is printed on buff-colored paper to distinguish errata from a *supplement*. Purchasers of *Title 24* are provided a registration card or online registration to complete and submit to the publisher in order to receive issued errata.

Express Terms: This is a document in a *rulemaking file* that proposes the *adoption* or amendment of a *state regulation* including a *building standard*. It provides the public with the proposed code language. Generally, proposed new language is illustrated with underlining (proposal) and language proposed for repeal is struck through (strikeout). A legend is provided within the document. See definitions for the other parts of a *rulemaking file*; *Notice of Proposed Action*, *Initial Statement of Reasons* and *Final Statement of Reasons*.

Final Statement of Reasons: This is a document in a *rulemaking file* that is developed after *public hearings* or a *paper hearing*. It is an update to the *Initial Statement of Reasons* and explains actions taken as a result of public comments. Often the originally proposed regulatory language is amended based on public comments and the final statement of reasons will explain that action. It will also explain why some public comments did not result in a change to the proposed regulatory language that is *approved* or *adopted*.

Government Code: One of the 29 codes that make up California state law enacted through California's legislative process. Requirements for building accessibility are found in Sections 12955.1 et. seq. and 4450 et. seq. of the Government Code.

Health and Safety Code: One of the 29 codes that make up California state law enacted through California's legislative process. The *Health and Safety Code* contains in excess of 130,000 sections organized into divisions, parts, and chapters, in that order. Divisions 12 and 13 contain provisions regarding the design and construction of buildings, including *California Building Standards Law*.

Initial Statement of Reasons: This is a document in a *rulemaking file* that provides a rationale of the need for each proposed *building standard* or amendment to existing *building standards*, generally section by section.

Intervening Code Adoption Cycle: This refers to the process to adopt new provisions and amendments to the *Title 24* edition currently in use. The cycle occurs at an 18-month interval between *triennial code adoption cycles*. The California *Building Standards Commission* establishes the opening and closing date of each cycle. The intervening code adoption cycle is used to incorporate new requirements of state law, improve the code clarity, and correct substantive errors and omissions. The *adopted* or *approved* changes are published for insertion into the current edition of Title 24. These new pages are called *supplements* and are printed on blue paper.

> **Note:** Prior to January 1, 2011, there was an *annual code adoption cycle* each year between the *triennial code adoption cycles*. Assembly Bill 1693 Statutes of 2010 amended the *Health and Safety Code* so that there is only one code adoption cycle between the *triennial code adoption cycles*.

Matrix Adoption Tables: Tables generally placed at the beginning of a *Title 24* chapter to identify code sections that are *adopted* or *adopted with amendment*, or an *adopted California Amendment* section. These tables are non-regulatory and are provided to assist the code user. Not all provisions of *Title 24* apply to all types of buildings, thus the matrix adoption tables help identify the application of each section. Learn how to use the matrix adoption tables in our Guide to Title 24 available on CBSC's website.

Model Code: A definition is provided in *Health and Safety Code* Section 18916. A model code is commonly understood to mean the codes published by the various private code development organizations such as the International Association of Plumbing and Mechanical Officials, International Code Council, National Fire Protection Association, and others.

> **Note:** See *Health and Safety Code* Sections 17922, 18916 and 18938.3 for information about the use of model codes in the development of *Title 24*.

Nine Point Criteria: This refers to required criteria for proposed *building standards* provided in *Health and Safety Code* Section 18930. The nine points are:
(1) The proposed *building standards* do not conflict with, overlap, or duplicate other *building standards*.
(2) The proposed building standard is within the parameters established by enabling legislation and is not expressly within the exclusive jurisdiction of another agency.
(3) The public interest requires the *adoption* of the *building standards*. The public interest includes, but is not limited to, health and safety, resource efficiency, fire safety, seismic safety, building and building system performance, and consistency with environmental, public health, and accessibility *statutes* and regulations.
(4) The proposed building standard is not unreasonable, arbitrary, unfair, or capricious, in whole or in part.
(5) The cost to the public is reasonable, based on the overall benefit to be derived from the *building standards*.
(6) The proposed building standard is not unnecessarily ambiguous or vague, in whole or in part.
(7) The applicable national specifications, published standards, and *model codes* have been incorporated therein as provided in this part, where appropriate.

(A) If a national specification, published standard, or *model code* does not adequately address the goals of the state agency, a statement defining the inadequacy shall accompany the proposed building standard when submitted to the commission.

(B) If there is no national specification, published standard, or *model code* that is relevant to the proposed building standard, the state agency shall prepare a statement informing the commission and submit that statement with the proposed building standard.

(8) The format of the proposed *building standards* is consistent with that *adopted* by the commission.
(9) The proposed building standard, if it promotes fire and panic safety, as determined by the State Fire Marshal, has the written approval of the State Fire Marshal.

Notice of Proposed Action: This is a document in a *rulemaking file* that provides a brief explanation of a building standard proposal, how to obtain the *Express Terms*

and related documents, how to comment on proposals, and the date, time and location of any *public hearing*.

Part: *Title 24* is divided into 13 parts. These are Parts 1, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12.

Note: As previously stated, Part 7 of *Title 24* is presently vacant.

Paper Hearing: This is an unofficial term that is commonly understood to mean there is no *public hearing* scheduled by the *state proposing agency* or *state adopting agency* for a proposed regulatory action. The *notice of proposed action* will state that a *public hearing* is not planned, but that a *public hearing* will be held if requested by the public within the specified timeframe. Not having a *public hearing* is a cost savings to the public. Comments regarding the proposed regulatory action must be submitted in writing.

Public Hearing: A public hearing by a state agency to consider a proposed *adoption* of a *building standard*. Hearings must be open to the public and are subject to the requirements of *Government Code Sections* 11120 – 11132, known as the *Bagley-Keene Open Meeting Act*. In the case of *Title 24* proposals, the date, time and location of a hearing are provided on CBSC's website and in the issued *Notice of Proposed Action.* At a public hearing, the public may provide oral testimony regarding the proposed *building standard*. Written comments may also be submitted without oral testimony.

Public Review or Public Comment Period: Generally, is a minimum 45-day period for the public to comment on proposed regulations. The period follows the issuance of *the Notice of Proposed Action, Express Terms* and *Initial Statement of Reasons*. A *public hearing* generally occurs during the public comment period or shortly after the close of the public comment period. The comment period may be no less than 45 days, if needed, a 15-day or additional 45-day public review period may follow the issuance of a new *Express Terms* document, to allow the public's review of amendments to the original proposed language as a result of public comment. The length of the additional public comment period will depend on the substance of the changes made after the initial public comments. Oral and/or written comments by the

public become part of the official record of the regulatory action. Oral and written comments may be submitted during a *public hearing* held by a state agency.

Publication Date and Publication: In relation to *Title 24 building standards*, it is the official date established by the *California Building Standards Commission (CBSC),* when *adopted building standards* are in print form and available to the public. It is not the *effective date*, which is no less than 180 days from the publication date, or a later date set by the *CBSC* commissioners. It can be said that the publication date starts the 180-day clock counting down to the *effective date* of the new code provisions.

This minimum period of 180 days provides the building industry, design professionals, contractors, local government planners, building officials, plan reviewers and building inspectors the opportunity to become familiar with the new *building standards* helping to ensure compliance with the new *California Building Standards Code*. The exceptions to this rule include *adopted emergency building standards*, which are effective immediately upon filing with the Secretary of State, and administrative regulations *adopted* into the *California Administrative Code* (*California Code of Regulations, Title 24, Part 1*) which are effective 30 days after filing with the Secretary of State, and changes without regulatory effect (CWoRE) which also are effective 30 days after filing with the Secretary of State.

Rulemaking File: Refers to the documents required by state law when proposing the *adoption* or *approval* of a *state regulation*, including a *building standard*. The rulemaking file creates an official record of the process, actions taken and the public's involvement. The rulemaking file is required to be available for *public review*. It includes the *Notice of Proposed Action, Express Terms, Initial Statement of Reasons,* and *Final Statement of Reasons*, transcriptions or recordings of *public hearings*, and all received public comments. The *California Building Standards Commission* maintains a rulemaking file for each *adoption* or *approval* of building standards.

State Adopting Agency: A state adopting agency has authority to develop and conduct its own *public comment periods* and *hearings*, and to adopt its proposed *building standards*. Its adoptions must be submitted to the *California Building Standards Commission* for *approval* and *publication* in *Title 24*. The *CBSC commissioners'* authority to approve *adoptions* by state adopting agencies is limited to

verifying that the *adoption* process was carried out in compliance with the requirements of state law. The state adopting agencies are:

- California Energy Commission
- State Historical Building Safety Board
- Board of State and Community Corrections
- Department of Food and Agriculture
- State Librarian
- State Lands Commission
- California State Water Resources Control Board – Division of Drinking Water (See *Health and Safety Code* Section 116880)
- Department of Water Resources

State Agency Abbreviations or Acronyms: The *state adopting agency* and *state proposing agency* acronyms identify the state agency adopting or proposing a *model code* provision or a *California amendment* for a specific building occupancy, feature or equipment. The acronyms are shown in code text and in the *matrix adoption tables*. See our Guide to Title 24 for more information about state agency acronyms and how they identify the application of *Title 24* provisions. It is available at *CBSC's* website.

State Proposing Agency: The state proposing agencies have authority to develop and propose *building standards* to *California Building Standards Commission (CBSC). CBSC* conducts the *public comment period(s)* and certain public meetings, and adopts the proposed *building standards* for *publication* in *Title 24*. The state proposing agencies are:

- Building Standards Commission
- Department of Housing and Community Development
- Division of the State Architect
- Office of the State Fire Marshal
- Office of Statewide Health Planning and Development
- Department of Consumer Affairs (and various boards therein)
- California Department of Public Health

State Regulations: The contents of the *California Code of Regulations*, Title 1 through Title 28, promulgated by agencies of the executive branch of state

government for the purpose of implementing, interpreting and carrying out the intent of state law. The Office of the State Fire Marshal, Division of the State Architect and the Department of Housing and Community Development are examples of state agencies that are charged by state law with the responsibility to develop state regulations that are *building standards* for *Title 24*. The *building standards* in *Title 24* are state regulations. For the purposes of our discussion about *Title 24*, the terms state regulations and *building standards* are synonymous.

Statute: A statute is a written law passed by a legislature generally at the state or federal level. Statutes set forth general intentions of law that courts apply to specific situations. Statutes are enacted to prescribe conduct, define crimes, create lesser governmental bodies, appropriate public monies, and in general to promote the public good and welfare. A statute may forbid a certain act, direct a certain act, make a declaration, or set forth governmental mechanisms to aid society. And in the case of the State of California, most often is enacted into law by signature of the governor.

Supplement: A page or pages containing the results of a *California Building Standards Commission (CBSC)* approved addition, amendment or repeal of building standards to an existing *Part* of *Title 24*. This includes rulemakings in an *intervening code adoption cycle, emergency building standards* and changes without regulatory effect (CWoRE). When *CBSC* publishes a recently adopted revision or addition to a current edition of a *part* of *Title 24*, replacement code pages are issued in the form of a supplement printed on blue paper. A supplement may be one or more pages in length as needed to provide replacement pages for a *part* of *Title 24*. Every page of the code with a change or addition is replaced in its entirety. A separate supplement is issued for each separate *part* of *Title 24* that is affected by the *approval* or *adoption* of *building standards*. Purchasers of *Title 24* are provided with a registration card or online registration to complete and submit to the publisher in order to receive supplements when they are published.

Title 24: The 24th title within the *California Code of Regulations*. Title 24 is reserved for *state regulations* that are *building standards* published by the *California Building Standards Commission.* Title 24 is given the name *California Building Standards Code*

by *Health and Safety Code* Section 18902, and is sometimes referred to as the State Building Standards Code.

Triennial Code Adoption Cycle: This refers to the code adoption cycle that occurs on a three-year interval to adopt a new edition of Title 24 based on new editions of model codes. The availability of new editions of the model codes initiates this process on dates established by the California Building Standards Commission resulting in the publication of a new California Building Standards Code. Otherwise, the process is similar to an intervening code adoption cycle.

Chapter 8. Self-evaluation Quiz

The following quiz will provide an opportunity to reinforce your understanding of the application and use of Title24. Answers are provided after the quiz questions.

Recommendations*:*

- To fully benefit from the quiz, complete it without looking at the answer sheet. Questions that you answer correctly will confirm your understanding of Title 24. Questions answered incorrectly will identify areas needing additional study.
- All questions may be answered from the information provided in this guide. However, it will be beneficial to have the 2019 California Building Code (CBC), Sections 1.2 through 1.14 available for additional reference and practice.

1. Title 24 is:
    a. The 24th title within the California Code of Regulations
    b. The 24th title within state law regarding building codes
    c. A state law enacted by the California Legislature
    d. Applicable to only state owned buildings
2. Title 24 applies:
    a. Only where a city or county has not adopted a model code
    b. Throughout the State of California and for all occupancies
    c. Only to buildings subject to state inspection
    d. Only to public school buildings and governmental buildings
3. The California Building Standards Commission is responsible for:
    a. Conducting public meetings and hearings regarding proposed Title 24 provisions
    b. Making proposed Title 24 provisions available to the public
    c. Publishing adopted building standards for inclusion in Title 24
    d. All of the above
4. Title 24 of the California Code of Regulations is given the name:
    a. California Building Code
    b. California Building Standards Law
    c. California Building Standards Code
    d. None of the above
5. The provisions of Title 24 are regulations that govern the design and construction of buildings, and are known as:
    a. Statutory law
    b. Building standards
    c. Model codes
    d. All of the above

6. Title 24 is divided into Parts, and Part 3 is the:

    a. California Building Code
    b. California Electrical Code
    c. California Mechanical Code
    d. California Plumbing Code

7. Some Parts of Title 24 are based on model codes. Those Parts will include Matrix Adoption Tables to identify:

    a. Adopted model code provisions
    b. Adopted California Amendments
    c. Adopted model code provisions and California Amendments
    d. Applicable state laws authorizing the adopted provisions

8. California Amendments within Title 24 are necessary:

    a. To include requirements of state law
    b. For compatibility with federal law or regulations
    c. To remove conflict with state laws and between model codes
    d. All of the above

9. The Building Standards Commission functions pursuant to a portion of the Health and Safety Code known as the:

    a. California Building Standards Law
    b. California Building Standards Code
    c. California Government Code
    d. California Building Code

10. The purpose for the provisions within the California Code of Regulations is:

    a. To make state laws available to the public
    b. To incorporate federal requirements within California law
    c. To implement and carryout the intent of state law
    d. All of the above

11. The California Code of Regulations includes regulations:

    a. In Titles 1 through 28
    b. From the Health and Safety Code
    c. From the Government Code
    d. All of the above

12. The state agencies responsible to developing building standards to be published in Title 24 include all the following except for:

    a. State Fire Marshal
    b. Department of Housing and Community Development
    c. Division of the State Architect
    d. Department of Motor Vehicles

13. The state agencies sometimes mark their California Amendments with an acronym. The agency acronyms, the agency's authority in law, and the application of the agency's adoptions may be found in sections of the first chapter or article of each part of Title 24. In Part 2, the 2019 California Building Code, which of these sections will provide information on adoptions by the Department of Housing and Community Development?

    a. Section 1.8
    b. Section 1.9
    c. Section 1.10
    d. Section 1.11

14. A California Amendment within Title 24 Parts 2, 3, 4 and 5 will be identified by:

    a. Bold print
    b. Underlined font print
    c. Italic font print
    d. Standard font print

15. The acronym used in the Matrix Adoption Tables by the Department of Housing and Community Development to identify adopted Title 24 provisions requiring accessibility within and about covered multifamily dwellings is:

    a. HCD 1
    b. HCD 1-AC
    c. DSA-AC
    d. CA

16. The acronym used within the Title 24 code text and Matrix Adoption Tables to identify adoptions by the Division of the State Architect relating to accessibility within and about public buildings and places of public accommodations is:

    a. HCD 1-AC
    b. DSA-SS/CC
    c. DSA-AC
    d. SFM or CA

17. The acronym used within the Title 24 text and Matrix Adoption Tables to identify adoptions by the Department of Housing and Community Development that may apply to hotels and motels is:

    a. HCD 1
    b. HCD 1-AC
    c. DSA-AC
    d. SFM

18. The acronym used within the Title 24 text and Matrix Adoption Tables to identify adoptions by the State Fire Marshal with fire and panic safety requirements that may apply to hotels, motels, apartments, and dwellings is:

    a. HCD 1
    b. HCD 1-AC
    c. DSA-AC
    d. SFM

19. While using the 2019 California Building Code (Part 2 of Title 24), if the reader is unfamiliar with the adoption jurisdiction of a state agency, the reader should refer to:

    a. CBC Sections 1.2 through 1.14
    b. The Government Code
    c. The Matrix Adoption Tables
    d. Any of the above

20. If a Matrix Adoption Table within the 2019 edition of Title 24, Part 2, were to show an adoption under the state agency acronym SLC, where can the reader learn of the jurisdiction of SLC?

    a. CBC Section 101
    b. Health and Safety Code Section 18930
    c. CBC Section 1.14
    d. Title 24, Part 1, Chapter 1, Article 4

Questions 21 through 31 are based on the Matrix Adoption Table for Chapter 10 of the 2019 California Building Code shown in part below.

CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE
CHAPTER 10 – MEANS OF EGRESS

(Matrix Adoption Tables are nonregulatory, intended only as an aid to the code user.
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC-CG	SFM	HCD			DSA			OSHPD					BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/CC	1	1R	2	3	4	5								
Adopt entire chapter	X							X	X														
Adopt entire chapter as amended (amended sections listed below)			X	X	X	X				X	X	X		X	X								
Adopt only those sections that are listed below							X																
Chapter / Section																							
1002.1			X																				
1003.1, not SFM exception							X																
1003.1						X																	
1003.1.1										X				X									
1003.1.2											X	X			X								
1003.2			X																				
1003.3 Exc.			X																				
1003.3.1			X																				
1003.3.3.1			X																				
1003.3.4				X	X	X																	
1003.5			X	X	X	X																	
Table 1004.1.2			X																				
1004.3			X																				
1005.3.1			X																				
1005.3.2			X																				
1005.7.1			X																				
1005.7.2			X																				
1006.2.1			X																				
Table 1006.2.1			X																				
1006.2.2			X																				
1006.2.2.4			X																				
1006.2.2.6			X																				
1006.2.2.7			X																				

21. Which of the following agencies adopts Chapter 10 without amendment?

    a. SFM
    b. HCD 1
    c. DSA-AC
    d. BSC

22. Which of the following agencies makes no Chapter 10 adoption?

    a. SFM
    b. BSC
    c. BSCC
    d. HCD 1

23. Which of these state agencies has adopted the entire chapter and makes amendments?

    a. HCD 1
    b. DPH
    c. BSC
    d. DSA-SS

24. The State Fire Marshal has adopted:

    a. The entire chapter and amended sections 1002.1, 1003.2, and more
    b. The entire chapter without amendment
    c. Only the marked sections such as sections 1003.2, 1003.3 Exc., 1003.3.1, 1003.3.3.1, 1003.3.4 and 1003.5 1003.1, 1003.1.1, and 1003.3.4

25. Does Chapter 10 have any application in permanent buildings in mobilehome parks?

    a. No, because Title 24 does not apply to mobilehome parks
    b. No, because it is not shown as adopted under the acronym HCD 1
    c. Yes, because it is shown adopted under the acronym HCD 2

26. For application in hotels, motels, apartments and dwellings, the Department of Housing and Community Development has adopted the entire Chapter 10 and amended section:

    a. 1003.1
    b. 1003.3.4
    c. 1004.3

27. Which of the following may apply to an apartment building and require accessibility features?

    a. Section 1003.1, because it is shown as adopted under SFM
    b. Section 1003.1, because it is shown as adopted by DSA-AC
    c. Section 1003.1, because it is shown as adopted under HCD 1/AC

28. Which of the following sections is not adopted for accessibility requirements in a retail building?

    a. Section 1003.2, because SFM amended this section
    b. Section 1002.1, because DSA-AC only adopts those identified amended sections
    c. Section 1003.3.4, because it is adopted by HCD-1/AC

29. Based on the above Matrix Adoption Table alone, are the Section 1002.1 provisions for handrails applicable to a single-family dwelling?

    a. No, because the section is not adopted
    b. Yes, because the entire chapter is adopted as amended under HCD 1
    c. Yes, because the entire chapter is adopted under DSA-SS

30. Based on the above Matrix Adoption Table alone, if Section 1004.3 included accessibility requirements, would the requirements apply to a retail occupancy?

    a. No, because the section is not adopted under DSA-AC
    b. Yes, because the entire chapter is adopted under DSA-SS
    c. Yes, because the entire chapter is adopted with amendments under SFM

31. The entire Chapter 10 is adopted under DSA-SS. Thus, all DSA-SS adoptions in Chapter 10 apply to all multistory buildings.

    a. True, because DSA-SS adoptions are for structural safety
    b. False, because DSA-SS does not adopt the chapter for multistory buildings
    c. False, because DSA-SS applies to only specific buildings such as publicly funded schools

Questions 32 through 35 are based on the 2019 California Building Code, Chapter 10 text shown below.

> **1009.8.1 System requirements.** Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location *and a* central control point is not a constantly attended location, a two-way communication system shall have a timed automatic telephone dial-out capability to a monitoring location or 9-1-1. The two-way communication system shall include both audible and visible signals.
>
> ***1009.8.1.1 Visible communication method. [DSA-AC and HCD 1-AC]*** *A button complying with Section 1138A.4 or Sections 11B-205 and 11B-309 in the area of refuge shall activate both a light in the area of refuge indicating that rescue has been requested and a light at the central control point indicating that rescue is being requested. A button at the central control point shall activate both a light at the central control point and a light in the area of refuge indicating that the request has been received.*
>
> **1009.8.2 Directions.** Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to the two-way communication system. Signage shall comply with *Chapter 11A, Section 1143A or Section 11B-703.5* requirements for visual characters.

32. Section 1009.8.1 is:

    a. Applicable to only high-rise buildings
    b. A model code provision
    c. A California Amendment exclusively

33. Subsection 1009.8.1.1 is:

    a. A model code provision
    b. A California Amendment
    c. Applicable to all buildings other than a hotel or apartment

34. Section 1009.8.1.1:

    a. Will apply where accessibility is required
    b. Is not a California Amendment
    c. Is adopted by the SFM so it applies in high-rise buildings

35. Section 1009.8.2 includes a California Amendment. To determine the state agency adopting the amendment, the code user:
    a. Should read the history notes provided with the 2019 California Building Code
    b. May disregard the amendment because it applies to only state inspected buildings
    c. Should refer to the Matrix Adoption Tables for CBC Chapter 10.

Quiz Answers and Guide Location Reference

1. a Chapter 2
2. b Chapter 2
3. d Chapter 2
4. c Chapter 2
5. b Chapter 1
6. b Chapter 2
7. c Chapters 2 and 3
8. d Chapter 2
9. a Chapter 2
10. c Chapter 2
11. a Chapter 2
12. d Chapters 2 and 3
13. a Chapter 3
14. c Chapters 2 and 3
15. b Chapters 2 and 3
16. c Chapters 2 and 3
17. a Chapters 2 and 3
18. d Chapters 2 and 3
19. a Chapters 2 and 3
20. c Chapters 2 and 3
21. d In the Matrix Adoption Table, an "X" appears in the row "Adoption entire chapter" under BSC (Chapter 3).
22. c In the Matrix Adoption Table there is no "X" in the top three rows under BSCC, thus no adoption (Chapter 3).
23. a In the Matrix Adoption Table, an "X" appears in the HCD 1 column opposite "Adopt Entire Chapter as amended (amended sections listed below)". This means the chapter is adopted in whole and marked sections are amended (Chapter 3).
24. a In the Matrix Adoption Table, an "X" appears in the SFM (Acronym for Office of the State Fire Marshal) column opposite "Adopt Entire Chapter as amended (amended sections listed below)." An "X" appears for sections 1002.1, 1003.2, and others (Chapter 3).
25. c In the Matrix Adoption Table, an "X" appears in the HCD 2 column opposite "Adopt Entire Chapter as amended (amended sections listed below)." The acronym "HCD 2" identifies adoptions by HCD with application to permanent

buildings in mobilehome parks according to 2019 California Building Code Section 1.8.2.1.3 (Chapter 3).

26. b In the Matrix Adoption Table, an "X" appears in the HCD 1 column opposite "Adopt Entire Chapter as amended (amended sections listed below)." An "X" appears opposite Section 1003.3.4. The acronym HCD 1 applies to hotels, motels, apartments and dwellings according to 2019 California Building Code Section 1.8.2.1.1 (Chapters 2 and 3).

27. c In the Matrix Adoption Table, HCD 1A/C adopts the entire Chapter with amendments. The acronym HCD 1-AC identifies accessibility adoptions applicable to multifamily dwellings (Chapters 2 and 3 and 2019 CBC Section 1.8.2.1.2).

28. b In the Matrix Adoption Table, an "X" appears in the DSA-AC column opposite "Adopt only those sections that are listed below." The acronym DSA-AC identifies adoptions with accessibility requirements applicable to public buildings, public accommodations, commercial facilities and publicly funded housing (Chapter 3 and 2019 CBC Section 1.9).

29. b The agency with adoption jurisdiction for this subject is HCD. HCD 1 adoptions apply to single-family dwellings. The entire chapter is adopted as amended under HCD 1. DSA-SS adoptions do not apply to off-campus housing occupancies (Chapter 3).

30 a Accessibility in retail occupancies is within the adoption jurisdiction of DSA-AC. An "X" appears opposite "Adopt only those sections that are listed below" in the DSA-AC column. Section 1004.3 is not a listed section under DSA-AC (Chapter 3).

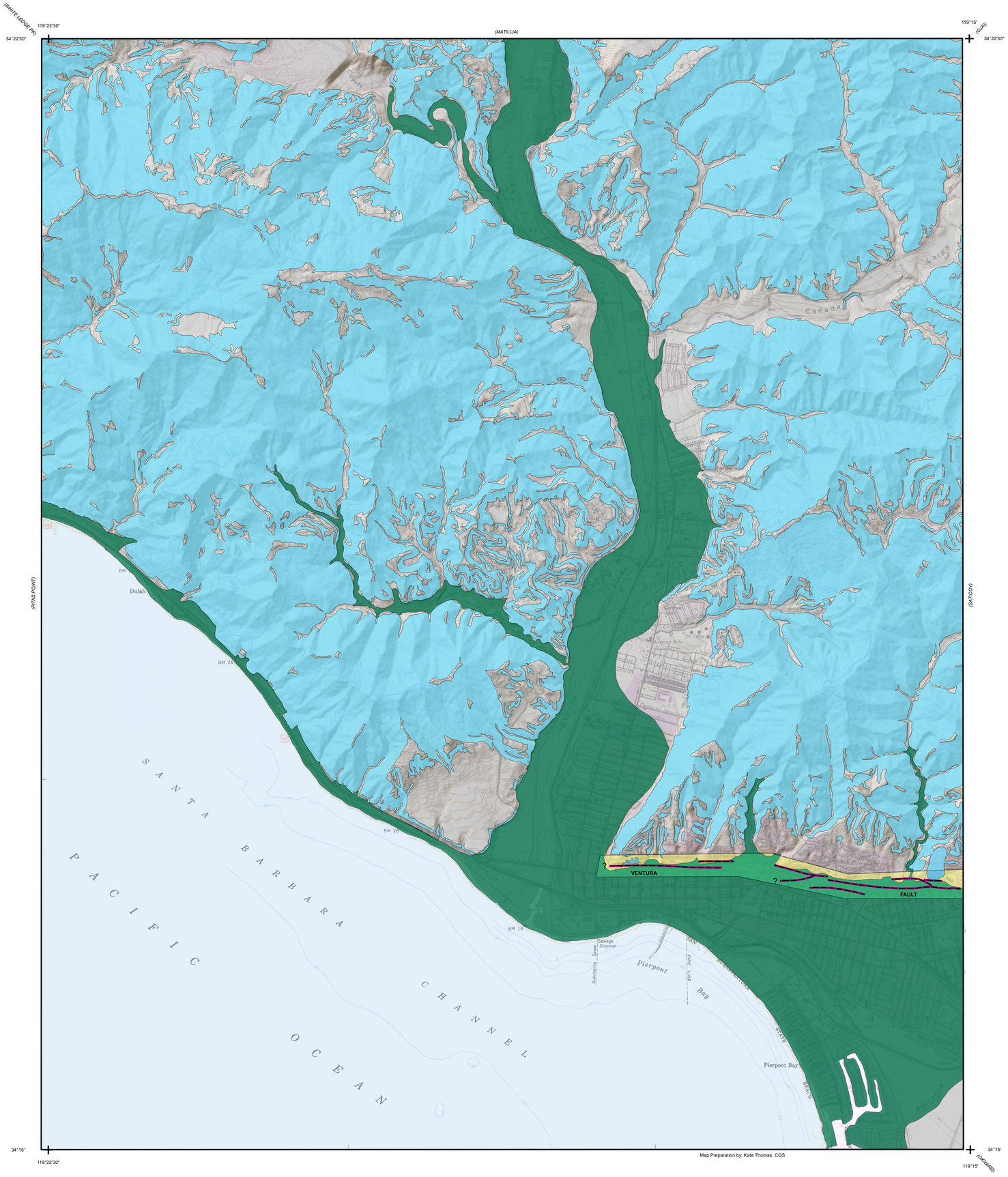
31. c DSA-SS adoptions apply to specific building uses including public school buildings as explained in Section 1.9.2 of the 2019 California Building Code (Chapter 3).

32. b Standard font print identifies the text as model code text (Chapters 2 and 3).

33. b The italic font print identifies the text as being a California Amendment (Chapters 2 and 3).

34. a Within the text, the state agency acronyms DSA-AC and HCD 1-AC are included. An experience code user will recognize that both acronyms relate to accessibility adoptions. Otherwise, the code user will need to read CBC Sections 1.2 through 1.14 to learn the meaning of the two acronyms.

35. c Whenever there is a California Amendment without a state agency acronym to identify the state agency adopting the amendment, the only way to determine the identity of the agency is to refer to the Matrix Adoption Table (Chapter 3).



Earthquake Zones of Required Investigation Ventura Quadrangle

California Geological Survey

This Map Shows Both Alquist-Priolo Earthquake Fault Zones And Seismic Hazard Zones Issued For The Ventura Quadrangle

This map shows the location of Alquist-Priolo (AP) Earthquake Fault Zones and Seismic Hazard Zones, collectively referred to here as Earthquake Zones of Required Investigation. The Geographic Information System (GIS) digital files of these regulatory zones released by the California Geological Survey (CGS) are the "Official Maps." GIS files are available at the CGS website http://maps.conservation.ca.gov/cgs/informationwarehouse/. These zones will assist cities and counties in fulfilling their responsibilities for protecting the public from the effects of surface fault rupture and earthquake-triggered ground failure as required by the AP Earthquake Fault Zoning Act (Public Resources Code Sections 2621-2630) and the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6). For information regarding the general approach and recommended methods for preparing these zones, see CGS Special Publication 42, *Earthquake Fault Zones, a Guide for Government Agencies, Property Owners/Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California*, Appendix C, and CGS Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California*.

For information regarding the scope and recommended methods to be used in conducting required site investigations refer to CGS Special Publication 42, and CGS Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*. For a general description of the AP and Seismic Hazards Mapping acts, the zonation programs, and related information, please refer to the website at www.conservation.ca.gov/cgs/.

MAP EXPLANATION

EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

OVERLAPPING EARTHQUAKE FAULT AND SEISMIC HAZARD ZONES

Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Zone.

Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

**Note: Mitigation methods differ for each zone –
AP Act only allows avoidance; Seismic Hazard Mapping Act allows mitigation by engineering/geotechnical design as well as avoidance.**

ADDITIONAL INFORMATION

For additional information on the zones of required investigation presented on this map, the data and methodology used to prepare them, and additional references consulted, please refer to the following:

The Ventura Fault, in the Ventura Quadrangle, Ventura County, California.
California Geological Survey, Fault Evaluation Report FER-13.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/FER/013/

For more information on the Alquist-Priolo Earthquake Fault Zoning Act please refer to:
http://www.conservation.ca.gov/cgs/rghm/ap/Pages/main.aspx

Seismic Hazard Zone Report for the Ventura 7.5-minute Quadrangle, Ventura County, California.
California Geological Survey, Seismic Hazard Zone Report 067.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/SHZR/SHZR_067_Ventura.pdf

For more information on the Seismic Hazards Mapping Act please refer to:
http://www.conservation.ca.gov/cgs/shzp/Pages/SHMPpginfo.aspx

Click the link below to learn how to take greater advantage of the GeoPDF format of this map after downloading.
http://gmw.conservation.ca.gov/SHP/EZRIM/Docs/TerragoUserGuide.pdf

VENTURA QUADRANGLE

EARTHQUAKE FAULT ZONES

**Delineated in compliance with
Chapter 7.5 Division 2 of the California Public Resources Code
*(Alquist-Priolo Earthquake Fault Zoning Act)***

OFFICIAL MAP

Released: July 26, 1978

STATE GEOLOGIST

SEISMIC HAZARD ZONES

**Delineated in compliance with
Chapter 7.8 Division 2 of the California Public Resources Code
*(Seismic Hazards Mapping Act)***

OFFICIAL MAP

Released: July 2, 2003

STATE GEOLOGIST

Study area defined by USGS quadrangle boundaries using NAD 27, represented by the visible map extent. Data are maintained and distributed in California Albers (meters), NAD 83, [EPSG:3310] as shown by tics and coordinates.
Shaded topographic relief derived from USGS 10 meter NED, 2013.
Topographic base map from USGS 1951, photorevised, 1967.
Street data from US Census Bureau TIGER/Line, 2016.

Scale 1: 24000

1 0.5 0 1 2 Miles
1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000 Feet
1 0.5 0 1 2 Kilometers
1000 500 0 1000 2000 Meters

Contour Interval 20 Feet

12½° TRUE NORTH MAGNETIC NORTH
Approximate Declination, 2016

N

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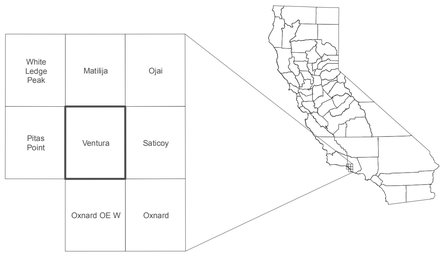
www.conservation.ca.gov/cgs



IMPORTANT

PLEASE NOTE THE FOLLOWING FOR ZONES SHOWN ON THIS MAP

1) This map may not show all faults that have the potential for surface fault rupture, either within the Earthquake Fault Zones or outside their boundaries. Additionally, this map may not show all areas that have the potential for liquefaction, landsliding, strong earthquake ground shaking or other earthquake and geologic hazards. Also, a single earthquake capable of causing liquefaction or triggering landside failure will not uniformly affect the entire area zoned.

2) Boundaries of Earthquake Fault Zones, if included on this map, are based on interpreted Holocene-active fault traces.

3) The identification and location of these faults are based on the best available data. However, the quality of data used is varied. Traces have been depicted as accurately as possible at a map scale of 1:24,000.

4) Liquefaction zones may also contain areas susceptible to the effects of earthquake-induced landslides. This situation typically exists at or near the toes of existing landslides, downslope from rockfall or debris flow source areas, or adjacent to steep stream banks.

5) Landslide zones on this map were determined, in part, by adapting methods first developed by the U.S. Geological Survey (USGS). Landslide hazard maps prepared by the USGS typically use experimental approaches to assess earthquake-induced and other types of landslide hazards. Although aspects of these new methodologies may be incorporated in future CGS seismic hazard zone maps, USGS maps should not be used as substitutes for these Official SEISMIC HAZARD ZONES maps.

6) USGS base map standards provide that 90 percent of cultural features be located within 40 feet (horizontal accuracy) at the scale of this map. The identification and location of liquefaction and earthquake-induced landslide zones are based on available data. However, the quality of data used is varied. The zone boundaries depicted have been drawn as accurately as possible at this scale.

7) Information on this map is not sufficient to serve as a substitute for the geologic and geotechnical site investigations required under Chapters 7.5 and 7.8 of Division 2 of the California Public Resources Code.

8) Seismic Hazard Zones identified on this map may include developed land where delineated hazards have already been mitigated to city or county standards. Check with your local building/planning department for information regarding the location of such mitigated areas.

9) DISCLAIMER: The State of California and the Department of Conservation make no representations or warranties regarding the accuracy of the data from which these maps were derived. Neither the State nor the Department shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

SPECIAL PUBLICATION 118

RECOMMENDED CRITERIA FOR DELINEATING SEISMIC HAZARD ZONES IN CALIFORNIA

May 1992
Revised April 2004

CALIFORNIA GEOLOGICAL SURVEY
MICHAEL S. REICHLE
ACTING STATE GEOLOGIST

SPECIAL PUBLICATION 118

RECOMMENDED CRITERIA FOR DELINEATING SEISMIC HAZARD ZONES IN CALIFORNIA

May 1992
Revised April 2004

Copies of these criteria, California's Seismic Hazard Mapping Act, and other related information are available on the World Wide Web at http://www.conservation.ca.gov/cgs/. Copies are also available for purchase from Publication Sales Offices of the California Geological Survey.

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PREFACE

The Seismic Hazards Mapping Act (Chapter 7.8, Sections 2690 et seq., California Public Resources Code) requires the State Geologist, Chief of the Department of Conservation's California Geological Survey (CGS), to designate seismic hazard zones. These zones assist cities and counties in fulfilling their responsibilities for protecting the public health and safety from the effects of strong ground shaking, earthquake-induced landslides, liquefaction, or other ground failures. To assist the State Geologist in fulfilling this responsibility, the act directs the State Mining and Geology Board (SMGB), in consultation with an advisory board, to develop guidelines and criteria for the preparation of seismic hazard zones in the state. This report presents the recommendations of the Seismic Hazard Mapping Act Advisory Committee as accepted by the SMGB. It is expected that these criteria will continue to evolve as our understanding of seismic phenomena and the methods used to assess their likelihood and potential impacts on the built environment improves.

The Seismic Hazard Mapping Act Advisory Committee formed three working groups composed of acknowledged experts to address ground shaking, liquefaction, and landslide hazards in an attempt to gain a consensus on how to prepare the various maps (see Acknowledgments). A fourth working group on planning and implementation was formed to ensure that the resulting seismic zonation maps would be of practical use in the local planning and building department decision-making process. Recommendations from these working groups are principal components of this document.

Previous versions of this publication (May 1992; July 1999) presented criteria for delineating seismic hazard zones for liquefaction and earthquake-induced landslides. This revision reflects modifications to recommended criteria that relate to liquefaction zones only. Most notably, specific criteria are recommended for determining anticipated depths to saturated soils arid regions. Also, a general edit and update of the document was done for clarification purposes and to incorporate new developments in pertinent soil test technology and analyses.

PROBABILISTIC SEISMIC HAZARD MAP

INTRODUCTION

The California Department of Conservation, California Geological Survey (CGS) is charged with implementing requirements of the Seismic Hazards Mapping Act of 1990. Appropriate maps of expected ground shaking hazard are required and are an underpinning for mapping seismic hazard zones - amplified ground shaking, liquefaction and earthquake-induced landsliding. The following recommendations are provided to assist the CGS in mapping ground shaking hazard on a regional scale throughout the state.

GENERAL CONSIDERATIONS FOR MAPPING EXPECTED GROUND SHAKING HAZARD

The Advisory Committee recommends preparation of a suite of regional ground shaking hazard maps using Probabilistic Seismic Hazard Analysis (PSHA) techniques (NRC, 1988). The following maps should be produced at statewide scales:

1. Maps of peak ground acceleration, and spectral acceleration at 0.3 sec, 1.0 sec, and 3.0 sec., with exceedance probabilities of 10% in 50 years, 50% in 50 years, and 10% in 100 years.

2. Maps of peak ground acceleration, weighted with respect to a M7.5 earthquake, for evaluation of liquefaction potential and earthquake-induced landslide potential, with exceedance probabilities of 10% in 50 years, 50% in 50 years, and 10% in 100 years.

Existing probabilistic seismic hazard computational codes are acceptable, and neither basic modeling developments nor substantive computational code changes are needed. The results should capture and display uncertainties on input parameters, including seismic sources, earthquake frequency, maximum magnitude, seismic wave attenuation, and site response. Input interpretations should be developed by an earth science team using consistent approaches throughout the state and formal uncertainty elicitation procedures (NRC, 1988).

PSHA mapping should extend to the near offshore regions, and use Uniform Building Code (UBC) soft rock conditions as the base site condition and reference soil column. A companion report should be prepared that contains analysis of the key sources of uncertainty in enough depth and detail of presentation to permit users to factor uncertainty into their use of the maps. The analysis of uncertainty may require modest computational code development. Work should be coordinated with on-going PSHA efforts of the U.S. Geological Survey (USGS).

SEISMIC SOURCE MODELING

Three general types of seismic sources are expected, 1) sources that model active faults, 2) sources that model "active" structures that may contain significant faults (i.e., active fold belts, such as those along the western edge of the Central Valley and within the LA Basin), and 3) sources that model distributed seismicity that cannot be assigned to specific geologic structures. All three types of sources can be readily modeled within existing computational programs. The details of fault geometry should not have a major impact on the results of a regional hazard study in terms of its effect on the density function for distance to rupture. (It may have a significant impact on parameters such as maximum magnitude and seismicity rate, if moment (slip) rate methods are used). Some special attention to details of geometry may be needed in the northwest to model the Cascadia subduction zone.

The seismic sources can be identified on the basis of existing extensive fault mapping and surface and/or subsurface mapping of actively deforming folds for California. Careful thought needs to be given to "background" sources to account for possible unidentified major sources. Uncertainty in sources can be modeled by providing weighted alternatives.

MAXIMUM MAGNITUDE

Maximum magnitudes for fault-specific sources should be based on interpretations of the potential maximum size of

rupture and the well-developed empirical relationships between rupture dimensions and magnitude that are documented in the literature. Assessments of maximum magnitudes for tectonic structures may have to rely more on analogy than on specific dimensions of structures, although the general characteristics of the structure (e.g., long and continuous folds versus short and offset folds) may suggest trends in the maximum size that could be used to weight the various analogies. Assessments for seismicity zones and background zones most likely will have to rely on arguments based on analogy, largest observed events without surface rupture manifestations, and historical observations. Uncertainty on maximum magnitude should be modeled using a variable with a distribution rather than a single value.

Earthquake Frequency

The primary model for earthquake recurrence should be the Poisson model, because we know little more than average rates for the vast majority of seismic sources. Time-dependent models may be applicable in a few areas. This could be tested to assess how regional mapping results might be adjusted. For fault-specific sources, earthquake frequency (slip rate) should be based primarily on geologic information for those faults where data on paleoseismicity can be used to establish a rate. For other tectonic structures, other geologic information may have some use where rates of deformation can be established and where a fraction can be attributed to movement on faults. However, historical seismicity rates will likely be the primary source of recurrence information for these other structures, as it will be for distributed seismicity zones. Recurrence parameters should be modeled as variables with distributions.

Minimum Magnitude

It is recommended that the minimum magnitude of interest be set about magnitude 5. It may be desirable to compute results for a higher minimum magnitude to capture the level of hazard from major earthquakes compared to the hazard from moderate earthquakes.

Seismic Wave Attenuation

A new generation of seismic wave attenuation curves should be developed using an updated empirical database from recent strong-motion recordings. This work should be coordinated with ongoing seismic wave attenuation studies at the USGS. "Standard" attenuation curves should be developed for various UBC site soil conditions.

Magnitude dependence of attenuation dispersion should be confirmed and incorporated into the PSHA if appropriate.

A number of site/source/path conditions may influence seismic wave attenuation. Not all of these conditions are accommodated in the empirical curves when they are applied at a given site (e.g., long period ground motions in basins, faulting style, near-source effects at long periods, crustal structure, focal depth and topography). The PSHA should proceed with an awareness of these effects and they should be discussed in the commentary. In general, until more definitive procedures can be developed, the PSHA should treat these effects as part of the randomness in seismic wave attenuation.

AMPLIFIED SHAKING HAZARD ZONES

Building codes are currently the primary means of mitigating the effects of strong earthquake shaking on buildings. The effect of local surface geology on expected shaking is accounted for by seismic coefficients used in the lateral force formula, which correspond to the soil profile types defined in the 2001 California Building Code, which is based on the 1997 UBC (ICBO, 1997). This revision also contains a "near-source" factor that takes into consideration effects of the proximity to nearby earthquake source ruptures on shaking. Maps of known active fault near-source zones have been prepared for use with the 1997 UBC (ICBO, 1998). The advisory committee believes that, given the current understanding of the effects of geologic materials and structure on earthquake ground motions, there would be no

benefit in establishing "amplified shaking hazard zones" for purposes of design and construction. The purpose of the Seismic Hazard Mapping Act is to identify where special provisions, beyond those contained in the UBC, are necessary to ensure public safety. This need has not been recognized for the hazard of ground shaking. Design provisions contained in the UBC are believed to be representative of current knowledge and capability in earthquake-resistant design.

Consideration should be given to preparation of "informational" maps that identify where soft-soil profiles (type S_E) are more likely to be found. Similarly, identifying areas where basin structure or topography may enhance ground shaking or where an aggregate of such adverse conditions within near-source zones might occur could be of value for land-use planning purposes. The development and utility of these options should be investigated.

LIQUEFACTION HAZARD ZONES

INTRODUCTION

The California Department of Conservation, California Geological Survey (CGS) is the principal state agency charged with implementing the 1990 Seismic Hazard Mapping Act. The following are recommended criteria to assist CGS in mapping liquefaction zones of required investigation. The zones identify areas where site-specific geotechnical investigations must be conducted to assess liquefaction hazard before development and, if a hazard exists, provide a technical basis to mitigate the hazard.

LIQUEFACTION MAPPING CRITERIA

Liquefaction zones of required investigation are geographic areas meeting one or more of the following criteria:

1. Areas known to have experienced liquefaction during historical earthquakes.

Field studies following earthquakes indicate liquefaction tends to recur in certain areas (Youd, 1984). There are many published accounts of liquefaction and it is recommended that CGS include these sites in the liquefaction zones of required investigation.

2. Areas of uncompacted fills that are saturated, nearly saturated, or may be expected to become saturated.

In some areas there has been a practice of creating usable land by placing artificial fill on tidal flats or in ravines. Stratigraphic principles are of little use in characterizing soils within these fills, which can be less homogeneous than natural deposits. There is no reason to assume stratification in these fills and the validity of extrapolating subsurface data is questionable. CGS can search for evidence of uncompacted artificial fills by using maps showing old shorelines, comparing archival and modern topographic maps, studying logs of boreholes, and obtaining reports or original plans of projects involving reclaimed land.

3. Areas where analyses of existing data indicate that the soils are potentially liquefiable.

Four key types of information are generally available for producing liquefaction zones of required investigation:

(1) Geology maps that characterize depositional environments and relative ages of Quaternary sedimentary deposits.

(2) Ground-water data used to estimate depths to saturated soils.

(3) Geotechnical borehole data that describe the lithology and engineering properties of subsurface deposits.

(4) Seismic data that provide ground-motion parameters (liquefaction opportunity) used in quantitative liquefaction analyses.

Geology: The vast majority of liquefaction hazard areas are underlain by recently deposited sand and silt. These deposits are not randomly distributed, but occur within a narrow range of sedimentary and hydrologic environments.

Investigators commonly use geologic criteria to establish boundaries of areas found to be susceptible to liquefaction through evaluation of other criteria, such as geotechnical analysis (Youd, 1991). CGS can obtain Quaternary geologic maps that show relative age estimates of depositional units based on ages reported in the literature, stratigraphic relationships, and soil profile descriptions. In addition to maps, analysis of historical aerial photographs and and other remote sensing imagery may reveal areas of flooding, recent sediment accumulation, or evidence of past liquefaction.

Ground Water: Saturation reduces the effective normal stress of near-surface sediment, thereby increasing the likelihood of earthquake-induced liquefaction (Youd, 1973). CGS can compile and interpret ground-water data to identify areas characterized by, or anticipated to have in the future, near-surface saturated soils. For purposes of seismic hazard zonation, "near-surface" means at a depth less than 40 feet.

Natural hydrologic processes and human activities can cause ground-water levels to fluctuate over time. Therefore, it is impossible to predict depths to saturated soils during future earthquakes. One method of addressing time-variable depths to saturated soils is to establish an anticipated high ground-water level based on historical ground-water data. In areas where ground water is either currently near-surface or could return to near-surface within a land-use planning interval of 50 years, CGS can construct regional contour maps that depict these levels. In some areas with low precipitation, records may indicate that near-surface ground water existed during historical time, but large withdrawal and low recharge rates preclude a return to those conditions within 50 years. For these areas, the historically highest ground-water level should not be used to establish the anticipated depth to saturated soil used for hazard evaluation. For these and all other areas, CGS can delineate present or anticipated near-surface saturated soils caused by locally perched water and seepage from surface-water bodies.

Future initiation of large-scale, artificial recharge programs could result in significant rises in ground-water levels over 50 years. When alerted of such plans, CGS can evaluate their impacts relative to liquefaction potential and revise official seismic hazard zone maps, if necessary.

Geotechnical Data: CGS should collect available geotechnical reports and compile information on the engineering properties of late Quaternary sediment. Information generated by standard penetration tests (SPT), cone penetration tests (CPT), shear wave velocity tests, and Becker hammer tests, along with laboratory textural analyses, is used in "simplified procedures" to evaluate the liquefaction resistance of soils (Youd and others, 2001).

For sandy and silty soils, SPT and CPT results are the data most commonly used to characterize soils for quantitative evaluation of resistance to liquefaction (Youd and others, 2001). To ensure consistency and quality data, these soil property tests should be conducted according to ASTM standards (for SPT: D1586-99 and D6066-96e1, and for CPT: D3441). "Standardized" penetration resistance values are used in simplified procedure when evaluating liquefaction resistance. Guidelines for performing SPT, and correlations for conversion of non-standard penetration test data to equivalent standardized penetration resistance $(N_1)_{60}$, are presented in Seed and others (1984; 1985), Seed and DeAlba (1986), Youd and Idriss (1997), Youd and others (2001) and Seed and others (2003). Standard CPT-based characterization of soil and evaluation of liquefaction resistance is done using measurements of the tip resistance (q_c) of the probe being pushed into a soil (*e.g.* Olsen, 1988; Moss, 2003). Evaluation of liquefaction resistance of gravelly soils can be based on in-situ penetration resistance measured using the large-scale Becker Hammer system (Harder, 1988; 1997). Characterization of soil properties with measurements of shear wave velocity is increasingly being used in evaluating a soil's resistance to liquefaction (*e.g.* Andruss and Stokoe, 2001).

Seismicity: Liquefaction opportunity is a measure of the potential for ground shaking strong enough to generate liquefaction. Analyses of in-situ liquefaction resistance require assessment of liquefaction opportunity. In accordance with requirements of the Seismic Hazards Mapping Act of 1990 and guidelines provided in the previous section of these recommended criteria, CGS has prepared for use in seismic hazard zone mapping a suite of regional ground-shaking hazard maps using Probabilistic Seismic Hazard Analysis (PSHA) techniques (NRC, 1988). The minimum level of seismic excitation that CGS should use to develop liquefaction zones of required investigation is that level defined by M7.5-weighted peak ground surface acceleration (PGA) with a 10% probability of exceedance over a 50-year period.

4. Areas where existing subsurface data are not sufficient for quantitative evaluation of liquefaction hazard.

In areas of limited subsurface data, it is recommended that CGS generate liquefaction zones of required investigation through the application of geologic criteria as follows:

(a) Areas containing soil deposits of late Holocene age (current river channels and their historical floodplains, marshes and estuaries) where the M7.5-weighted peak acceleration that has a 10% probability of being exceeded in 50 years is greater than or equal to 0.10 g and the anticipated depth to saturated soil is less than 40 feet; or

(b) Areas containing soil deposits of Holocene age (less than 11,000 years), where the M7.5-weighted peak acceleration that has a 10% probability of being exceeded in 50 years is greater than or equal to 0.20 g and the anticipated depth to saturated soil is less than 30 feet; or

(c) Areas containing soil deposits of latest Pleistocene age (between 11,000 years and 15,000 years), where the M7.5-weighted peak acceleration that has a 10% probability of being exceeded in 50 years is greater than or equal to 0.30 g and the anticipated depth to saturated soil is less than 20 feet.

Application of these criteria allows compilation of liquefaction zones of required investigation that are useful for preliminary evaluations, general land-use planning and delineation of special studies zones (Youd, 1991).

Candidate Methods for Future Development

To further improve delineation of liquefaction zones and strengthen the justification for geotechnical site investigations, CGS should follow the development of methods based on quantifying ground deformation associated with the occurrence of liquefaction. Estimates of liquefaction potential based on simplified methods are known to be conservative with regard to damage potential. Surface manifestation of liquefaction, such as venting of sand, may not always correlate with structural damage, especially when only a small fraction of the soil column liquefies and is accompanied by little or no settlement. Total thickness of liquefiable material and related potential for significant vertical settlement or horizontal deformation are better indicators of damage potential. Improvements in generalized measures such as the Liquefaction Potential Index (Iwasaki et al, 1982), Liquefaction Severity Index (Youd and Perkins, 1987), and methods for evaluating anticipated liquefaction-induced deformations and displacements (Bartlett and Youd, 1995; Seed et al., 2003), should be investigated for applicability in delineating seismic hazard zones in California.

EARTHQUAKE-INDUCED LANDSLIDE HAZARD ZONES

Introduction

The Department of Conservation, California Geological Survey (CGS) is the principal State agency charged with implementation of the provisions of the 1990 Seismic Hazard Mapping Act. These recommendations are developed to assist CGS in mapping earthquake-induced landslide hazard zones.

Landslide Hazard Zone Criteria

Earthquake-induced landslide hazard zones are areas meeting one or more of the following criteria:

1. Areas known to have experienced earthquake-induced slope failure during historic earthquakes.

It is very difficult, if not impossible, to distinguish earthquake-induced slope failures from landslides triggered by other mechanisms if the latest movement occurred prior to historic observations. Evidence of earthquake triggering for large pre-historic landslides tends to be circumstantial (for example, large dormant landslide complexes are often located near active faults), and the shallow disrupted landslides (debris or soil falls) found to be so common in historic earthquakes are not generally preserved in the geologic

record. However, landslides caused by some historic earthquakes in California have been well documented (Lawson, 1908; Morton, 1975; Harp and others, 1984; Spittler and Harp, 1990; Harp and Jibson, 1995). Wherever possible, CGS should include documented earthquake-triggered landslides within zones of required investigation.

2. Areas identified as having past landslide movement, including both landslide deposits and source areas.

Steep scarps and toe areas of existing landslides often fail in moderate to large earthquakes. The entire mass of existing large rotational landslide deposits is not typically reactivated by earthquake shaking (Keefer, 1984). However, long-duration earthquakes, such as a magnitude 8+ earthquake on the San Andreas fault in southern or northern California, could reactivate existing landslides and result in significant damage to structures. Because of this possibility, existing landslide deposits and their source areas should be identified and included in zones of required investigation.

An inventory of all landslides should be prepared for each hazard zone map area. All existing landslides, including the source (scarp) and deposit, should be mapped and given a level of confidence of interpretation. Landslides identified as "definite" or "probable" should be added to the geologic strength map and should always be included in zones of required investigation. Landslides identified as "questionable", that is, areas having geomorphic features that may be the result of other causes (e.g., stream terraces) and would require extensive exploration to verify a landslide origin, should be excluded from the earthquake-induced landslide zones.

3. Areas where CGS's analyses of geologic and geotechnical data indicate that the geologic materials are susceptible to earthquake-induced slope failure.

The recommended procedure for these analyses is the Newmark method as calibrated by McCrink and Real (1996), described below.

Newmark Method

Currently, the most advanced method for mapping regional earthquake-induced landslide hazards is based on the work of Newmark (1965). Newmark, recognizing the limitations of a factor of safety approach to dynamic slope stability analyses, devised a method of estimating the magnitude of ground displacement caused by a given earthquake ground motion. The U.S. Geological Survey tested Newmark's method on a landslide triggered by the 1979 Coyote Lake earthquake (Wilson and Keefer, 1983), and pioneered the application of the Newmark analysis for mapping earthquake-induced landslide hazard potential in San Mateo County (Wieczorek and others, 1985).

McCrink and Real (1996) calibrated the San Mateo County mapping methodology using landslides and near-field strong-motion records from the 1989 Loma Prieta earthquake. They also developed specific procedures allowing the method to be run on a geographic information system (GIS). Because of the extensive calibration and validation of this technique, earthquake-induced landslide hazard zones should be based on a Newmark dynamic displacement analysis using the parameters and specific approaches that have been developed and documented by McCrink and Real (1996).

The following paragraphs provide a brief description of the recommended analytical procedure developed in this calibration study.

Assumptions to the Model

In order to delineate the earthquake-induced landslide zones on a regional basis, the following assumptions and simplifications are reasonable:

- The failure should be assumed to be an infinite-slope type failure, that is, a relatively shallow failure that has a failure surface parallel to the ground surface.

- Only unsaturated slope conditions should be considered.

- The response of the geologic materials to earthquake shaking, in terms of landslide failure potential, should be characterized by the shear strength properties of the geologic materials.

Shear Strength Properties

In selecting representative shear strength properties to characterize geologic materials, CGS should use the most

appropriate combination of strength parameters available for the hazard map area. The calibration study (McCrink and Real, 1996) indicates that the internal angle of friction (f) alone is adequate for regional mapping of earthquake-induced slope failure potential. Where appropriate, CGS should identify adverse bedding conditions (out-of-slope bedding) and apply shear strength values representing the weaker materials (such as shale interbeds in a predominantly sandstone formation) of the mapped geologic unit. If geotechnical shear test data are insufficient or lacking for a mapped geologic unit, such a unit should be grouped with lithologically and stratigraphically similar units for which shear strength data are available. Published shear strength values can be used if necessary. The product of the shear strength characterizations should be a geologic material strength map, wherein the areas depicted on the map no longer represent "formations" but areas of similar shear strength.

Slope Stability Calculations

Slope stability calculations using the infinite-slope failure model should consist of first calculating a static factor of safety, followed by a calculation of the yield acceleration from Newmark's equation:

$$\alpha_y = (FS - 1)g \sin \alpha$$

where a_y is the yield acceleration (the horizontal ground acceleration required to cause the factor of safety to equal 1.0), FS is the **factor of safety** from the static stability analysis, **g** is the acceleration due to gravity, and α is the direction of movement of the slide mass, in degrees measured from the horizontal, when displacement is initiated (Newmark, 1965). For an infinite-slope failure model, α is the same as the slope angle.

Earthquake Ground Motion

Determination of anticipated earthquake shaking for the hazard map area should be made by selecting a representative strong-motion record or records, based on estimates of probabilistic ground motion parameters for levels of earthquake shaking having a 10 percent probability of being exceeded in 50 years (Petersen and others, 1996; Cramer and Petersen, 1996). The ground motion parameters used in the record selection should include mode magnitude, mode distance, and peak acceleration.

The currently accepted procedure calls for the selected strong-motion record to be integrated twice for a given yield acceleration to find the corresponding Newmark displacement. This process should be repeated for a number of yield accelerations to develop a mathematical relationship between the two parameters. The yield acceleration values calculated in the slope stability analyses should be correlated with Newmark displacements estimated from the strong-motion record to prepare a hazard potential map.

Slope Factors

CGS should use the most accurate and up-to-date terrain data available to derive slope and aspect maps. Digital terrain data should have a minimum vertical accuracy of 7 meters, and a maximum horizontal resolution of 10 meters. Acceptable sources of terrain data include Level 2 digital elevation models (DEMs) prepared by the U.S. Geological Survey, terrain data derived from interferometric synthetic aperture radar, photogrammetrically produced terrain data, and ground survey data. The selected terrain data sources should meet or exceed the above accuracy and resolution requirements. Slope gradient and slope aspect maps prepared from the digital terrain data should be generated using algorithms most appropriate for the terrain data used.

Earthquake-Induced Landslide Potential

An earthquake-induced landslide potential map should be prepared by combining and comparing (overlay) the geologic-material strength map with a slope gradient map. Hazard potential criteria for the hazard maps should be based on the amount of calculated Newmark displacement and corresponding slope angle for each geologic unit caused by the selected strong-motion record: "Very Low" would correspond to displacements less than 5cm; "Low" potential has displacements of 5cm to less than 15cm; "Moderate" potential has displacements of 15cm to less than 30cm; and "High" potential has displacements of 30cm or greater. On the basis of the calibration study (McCrink and Real, 1996), High, Moderate and Low levels of hazard potential (all areas with calculated displacements greater than 5cm) should be included within the landslide zone of required investigation.

Hazards Not Addressed

Because of the many simplifying assumptions made when applying the Newmark analysis to regional hazard mapping, the current method does not capture all types of ground failures known to occur during earthquakes. Earthquake-generated ground failures that are not addressed by the Newmark method include those associated with ridge-top spreading and shattered ridges. Also, run-out areas of triggered landslides may extend beyond zone boundaries into areas outside the zone of required investigation. The potential for ground failure resulting from liquefaction-induced lateral spreading of alluvial materials, considered by some to be a form of landsliding, should not be specifically addressed by the earthquake-induced landslide hazard zone because such hazards are to be included in the LQ-zones.

CANDIDATE METHODS FOR FUTURE DEVELOPMENT

In order to improve the accuracy of the Newmark method in capturing all appropriate landslide-prone areas CGS should continue to refine the method. From recent earthquakes it is known that ridge-top spreading typically occurs along strike-ridges, and that shattered ridges typically occur along the tops of high, narrow ridges. CGS should use this knowledge to develop models to assess the potential for these ground failures in the future. Methods to identify rock fall and debris flow runout areas should also be investigated, if deemed adequate, and incorporated into future zone maps.

In addition to improving the current Newmark model, CGS, in cooperation with USGS, should continue to investigate other analytical methods that might be useful in zoning. It is recommended that CGS investigate the applicability of two analytical methods as possible alternatives to the Newmark model:

1. The Multivariate Method

The multivariate method, described by Carrara and others (1991), uses a multivariate statistical procedure in conjunction with GIS techniques to model landslide hazards. In this method, the morphological, geological and vegetation characteristics for slopes are analyzed using a stepwise discriminant analysis, rating the characteristics in terms of their ability to discriminate between stable and unstable slopes. The method does not specifically address triggering mechanisms such as earthquakes or rainfall, but holds the potential to identify susceptible areas on the basis of past performance of the terrain and other characteristics.

2. The Probabilistic Slope Stability Method

The probabilistic slope stability method provides a systematic and quantitative way to deal with the uncertainties associated with soil and rock spatial variability, geotechni

cal sampling and testing, terrain models, and earthquake shaking. Vanmarcke (1976; 1980) has considered the basic 3-dimensional stability problem in a probabilistic framework for man-made embankments and natural slopes. The probabilistic approach has the advantage of being able to address the spatial variability of strength parameters and groundwater conditions, and may allow for the easy integration of probabilistic ground motion estimates. The USGS is evaluating a form of probabilistic earthquake slope stability in southern California using a Newmark displacement model and ground motion characterized by Arias intensity (Jibson and others, 1998).

The multivariate and probabilistic methods used in full or in part, may prove suitable as possible alternative approaches to earthquake-induced landslide hazard mapping. These methods are not currently well developed for regional mapping purposes, and calibration studies will need to be conducted. However, some or all of the procedures could be applied to more accurately and cost-effectively delineate earthquake-induced landslide hazard zones.

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Note: Individual affiliations are those at the time of membership on the board committee and working groups.

STATE MINING AND GEOLOGY BOARD:

Brian Baca
Charles Buckley
Larry Fanning
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Bruce R. Clark, Leighton and Associates, Chair
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Richard Clinton, Fireman's Fund
Robert D. Darragh, Dames & Moore
Sands Figuers, Norfleet Consultants
Paul Flores, Office of Emergency Services
Alvin Franks, Consultant
Diane Guzman, County of Santa Cruz
Sheila M. Murphy, City of Los Angeles
Jeanne Perkins, Association of Bay Area Governments
Allan Porush, Dames & Moore
Richard Roth, Department of Insurance
William U. Savage, Pacific Gas and Electric
J. Carl Stepp, Electric Power Research Institute

GROUND SHAKING WORKING GROUP:

William U. Savage, Pacific Gas and Electric, Chair
Norm Abrahamson, Consultant
Roger Borcherdt, U.S. Geological Survey
Allin Cornell, Stanford University
Kevin Coppersmith, Geomatrix
William Holmes, Rutherford and Chekene
I.M. Idriss, University of California-Davis
William Joyner, U.S. Geological Survey
Yoshiharu Moriwaki, Woodward Clyde Consultants
Jeanne Perkins, Association of Bay Area Governments
Allan Porush, Dames & Moore
Edward Rinne, Kleinfelder, Inc.
J.P. Singh, GeoSpectra
Paul Somerville, Woodward Clyde Consultants
J. Carl Stepp, Electric Power Research Institute, Former Chair

LIQUEFACTION HAZARDS WORKING GROUP:

Robert D. Darragh, Dames & Moore, Chair
Robert Hawk, City of San Diego
I.M. Idriss, University of California-Davis
William Lettis, William Lettis and Associates
Maurice Power, Geomatrix Consultants
Ray Seed, University of California
John Tinsley, U.S. Geological Survey
T. Leslie Youd, Brigham Young University

EARTHQUAKE-INDUCED LANDSLIDE HAZARDS WORKING GROUP:

Bruce R. Clark, Leighton and Associates, Chair
William Cotton, Cotton and Associates
Diane Guzman, County of Santa Cruz
Thomas Holzer, U.S. Geological Survey
Randall Jibson, U.S. Geological Survey
David Keefer, U.S. Geological Survey
Robert Larson, County of Los Angeles-Department of Public Works
Scott Lindvall, William Lettis and Associates
J. David Rogers, Rogers/Pacific

PLANNING AND IMPLEMENTATION WORKING GROUP:

Kenneth Blackman, City of Santa Rosa, Chair
Edward Baum, AAA of Southern California
John Buzas, County of Orange
Richard Eisner, Office of Emergency Services
Diane Guzman, County of Santa Cruz
George Mader, William Spangle and Associates
Jeanne Perkins, Association of Bay Area Governments
Richard Roth, Department of Insurance
Thomas Tobin, California Seismic Safety Commission
Ken Topping, Consultant

CALIFORNIA GEOLOGICAL SURVEY STAFF:

Allan Barrows, Senior Engineering Geologist
David Beeby, Principal Geologist
James Davis, State Geologist
Mark DeLisle, Senior Engineering Geologist
Earl Hart, Senior Geologist
Timothy McCrink, Senior Engineering Geologist
Keith Knudsen, Senior Engineering Geologist
Ralph Loyd, Senior Engineering Geologist
Bea McKamey, Land and Water Use Analyst
Mark Petersen, Senior Seismologist
Charles Real, Supervising Geologist
Michael Reichle, Supervising Geologist
Theodore Smith, Senior Engineering Geologist
Robert Sydnor, Senior Engineering Geologist

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EARTHQUAKE FAULT ZONES

A GUIDE FOR GOVERNMENT AGENCIES, PROPERTY OWNERS / DEVELOPERS, AND GEOSCIENCE PRACTITIONERS FOR ASSESSING FAULT RUPTURE HAZARDS IN CALIFORNIA

DEPARTMENT OF CONSERVATION
CALIFORNIA GEOLOGICAL SURVEY

STATE OF CALIFORNIA
EDMUND G. BROWN, JR.
GOVERNOR

THE NATURAL RESOURCES AGENCY
JOHN LAIRD
SECRETARY FOR RESOURCES

DEPARTMENT OF CONSERVATION
DAVID BUNN
DIRECTOR

CALIFORNIA GEOLOGICAL SURVEY
JOHN G. PARRISH, *PH.D.*
STATE GEOLOGIST

CALIFORNIA GEOLOGICAL SURVEY
JOHN G. PARRISH, PH.D.
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Revised 2018

California Department of Conservation
California Geological Survey
801 K Street, MS 12-31
Sacramento, CA 95814

Photo: Cottage destroyed by surface fault rupture on the Kekerengu Fault during the Mw 7.8 2016 Kaikoura earthquake, New Zealand. Approximately 10 meters of right-lateral fault displacement occurred under this house, tearing it from its foundation. Photo credit: VML 190573, Julian Thomson, GNS Science / Earthquake Commission

PREFACE

The purpose of the Alquist-Priolo Earthquake Fault Zoning Act is to regulate development near active faults so as to mitigate the hazard of surface fault rupture. The stated intent of the Act is to *"…provide policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults."* The Act also requires the State Geologist to compile maps delineating earthquake fault zones and to submit maps to all affected cities, counties and state agencies for review and comment. For the last 44 years, Special Publication 42 has been the vehicle by which the State Geologist, through the California Geological Survey, has informed affected agencies and the general public how and where Alquist-Priolo Earthquake Fault Zones are prepared.

This is the twelfth revision of Special Publication 42, which was first issued in December 1973 as an "Index to Maps of Special Studies Zones." Explanatory text was added in 1975 and subsequent revisions were made between 1976 - 2007. Since 2007, five supplements to Special Publication 42 have been issued to show the locations, names, and release dates of Earthquake Fault Zone maps released between 2012 - 2017.

This latest version of Special Publication 42 represents a significant departure from previous versions. Rather than serve simply as a source of background information and an index of 7.5-minute quadrangle maps containing Earthquake Fault Zones, this revised document is specifically intended to provide state-of-the-practice guidelines for affected permitting agencies and their reviewers, as well as for geoscience consulting practitioners representing property owners and developers. Such guidance has previously been presented in California Geological Survey Note 41, "General Guidelines for Reviewing Geologic Reports" and Note 49, "Guidelines for Evaluating the Hazard of Surface Fault Rupture," which traditionally have been included as appendices to Special Publication 42. The information presented in those notes has been significantly updated, expanded, and incorporated into this new version. As with the zone maps themselves, it is anticipated that this document will continue to be revised as major advances in the sciences associated with surface fault rupture occur. Background material regarding the California Geological Survey's Fault Evaluation and Zoning Program, which made up the bulk of previous versions of Special Publication 42, has been updated and now appears in Appendix C.

Maps of Earthquake Fault Zones are now available in multiple formats. Most recently, these maps have been made available through a web application (https://maps.conservation.ca.gov/cgs/EQZApp/) that allows users to navigate to an individual parcel and determine whether or not it is affected by any of CGS's regulatory zones (fault rupture, soil liquefaction, or earthquake landslides). Institutional users, such as cities and counties, can access the zone maps on their systems through an interactive web map service: (https://spatialservices.conservation.ca.gov/arcgis/rest/services/CGS_Earthquake_Hazard_Zones)

Those who prefer geographic information files (GIS) or portable document format (PDF) versions of maps, or wish to see how the zone maps were prepared through the associated fault evaluation report, can download these from the CGS Information Warehouse: (http://maps.conservation.ca.gov/cgs/informationwarehouse/).

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ACKNOWLEDGEMENTS

In 2016, the California Geological Survey convened an expert panel to focus on the development of an update to Special Publication 42. The intent was to prepare a guidance document for fault rupture hazards similar to CGS Special Publication 117A, which addresses hazards from soil liquefaction and earthquake-triggered landslides. This panel was composed of geoscience researchers, consultants and reviewers, as well as representatives of state, regional and local government agencies. Their willing participation in the preparation of this document significantly improved its quality and is greatly appreciated.

2016 to 2017 California Geological Survey Special Publication 42 Advisory Panel

- Robert Anderson – Alfred E. Alquist Seismic Safety Commission
- Dana Brechwald – Association of Bay Area Governments
- Dr. Alan Hull – Golder Associates Inc.
- Scott Lindvall – Lettis Consultants International, Inc.
- Sandra Potter – County of Sonoma; Chair, Geohazards Committee, State Mining and Geology Board
- Dr. Tom Rockwell - San Diego State University, Department of Geological Sciences
- Ted Sayre – Cotton, Shires and Associates, Inc.
- Dr. David Schwartz – U.S. Geological Survey

2016 to 2017 California Geological Survey Staff

- Timothy Dawson – Senior Engineering Geologist
- Timothy McCrink – Supervising Engineering Geologist
- Dr. Gordon Seitz – Engineering Geologist
- Ron Rubin – Engineering Geologist
- Eleanor Spangler – Engineering Geologist
- Jennifer Thornburg – Senior Engineering Geologist
- Christopher Tran – Student Assistant

SECTION 1: DEFINITIONS AND ACRONYMS

1.1 Definitions

Notes: Hyperlinks for references to statutes and regulations are linked to either the California Public Resources Code as published on the leginfo.legislature.gov website or the California Code of Regulations as published on the website maintained by Thomas Reuters Westlaw under the authority of the California Office of Administrative Law. Appendices A and B in this document are excerpts from the California Public Resources Code and California Code of Regulations.

Text in *italics* are terms that are defined in this section.

Alquist–Priolo Earthquake Fault Zoning Act: State of California law that addresses the hazard of *surface fault rupture* to *structures for human occupancy*. The provisions of the law are codified in the California Public Resources Code, Division 2, Chapter 7.5. In this document, the Alquist-Priolo Earthquake Fault Zoning Act will be abbreviated to "A-P Act."

Earthquake Fault Zones: Regulatory zones (also known as A-P Zones) that encompass traces of *Holocene-active faults* to address hazards associated with *surface fault rupture*. Earthquake Fault Zones are delineated by the State Geologist and implemented by *lead agencies* through permitting, inspection and land-use planning activities. (California Public Resources Code Division 2, Chapter 7.5, Section 2621.).

Earthquake Fault Zone Map: A map depiction of regulatory Earthquake Fault Zones. Traditionally prepared as paper printed products on a 7.5-minute topographic base, the authoritative Earthquake Fault Zone maps are now the geographic information system (GIS) representations available through the California Geological Survey's website (http://www.conservation.ca.gov/cgs). Portable document format (PDF) and web services are also available.

Earthquake Zones of Required Investigation Map: When an *Earthquake Fault Zone Map* is displayed or released with other regulatory seismic hazard zones as delineated under the Seismic Hazards Mapping Act, it is collectively referred to as an Earthquake Zones of Required Investigation Map (EZRIM). Site-specific investigations are required for certain developments within the zones depicted on these maps and, if the potential for the hazard is found to exist, plans to mitigate the hazard must be provided prior to a *lead agency* issuing a permit for construction.

fault: A shear or zone of closely associated shears across which earth materials on one side have been displaced with respect to those on the other side because of tectonic forces. A fault is distinguished from those fractures or shears caused by landsliding or other gravity-driven surficial failures.

> **age-undetermined fault:** A *fault* whose age of most recent movement is not known or is unconstrained by dating methods or by limitations in stratigraphic resolution.

Holocene-active fault: A *fault* that has had surface displacement within *Holocene* time (the last 11,700 years). (California Code of Regulations, Title 14, Division 2, Section 3601.(a)) See Section 2 for more details.

pre-Holocene fault: A *fault* whose recency of past movement is older than 11,700 years, and thus does not meet the criteria of *Holocene-active fault* as defined in the *State Mining and Geology Board* regulations (California Code of Regulations, Title 14, Division 2, Section 3601.(a)). See Section 3 on Geochronology.

fault investigation: A geologic investigation conducted by a *project geologist* designed to identify the location, recency, and nature of faulting at a *project* site (California Code of Regulations, Title 14, Division 2, Section 3603.(d)).

fault investigation report: A report produced by a *project geologist* that addresses the potential for *surface fault rupture* for a *project* (California Code of Regulations, Title 14, Division 2, Section 3603.(d)).

fault trace: The line formed by the intersection of a fault and the earth's surface. It is the representation of a fault as depicted on a map, including maps of *Earthquake Fault Zones* (California Code of Regulations, Title 14, Division 2, Section 3601.(b)).

fault-related (tectonic) ground deformation: Surface and near-surface deformation caused by fault rupture at depth or at some horizontal distance away from the fault that is not expressed as discrete surface faulting, including both brittle (fissures and tension cracks) and non-brittle (folding, warping, or tilting) deformation. Although not specifically addressed by the A-P Act, for the purposes of these Guidelines fault-related deformation encompasses any deformation that may impact the ability of a *structure for human occupancy* to perform as engineered in terms of life-safety and serviceability.

lead agency: The city, county, or state agency with the authority to approve *projects* and exercise "…their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults" (California Public Resources Code, Division 2, Chapter 7.5, Section 2621.5.(a).

mitigation: The act of reducing the hazard of *surface fault rupture* either through avoidance or engineered design. Under the *Alquist–Priolo Earthquake Fault Zoning Act*, the only mitigation allowed for *Holocene-active faults* is avoidance.

owner/developer: The party seeking permits to undertake a *project* as defined in the *Alquist–Priolo Earthquake Fault Zoning Act* (California Public Resources Code, Division 2, Chapter 7.5, Sections 2621.6.(a)).

professional geologist: A person licensed in the State of California with the Board for Professional Engineers, Land Surveyors, and Geologists as a geologist and entitled to practice geology in California, and use the title "Professional Geologist (PG)."

project geologist: A *professional geologist* in the State of California who is retained by an *owner/developer* and charged with conducting a *fault investigation* and producing a *fault investigation report*.

reviewing geologist: A *professional geologist* in the State of California who is an agent of the *lead agency* and charged with reviewing the *fault investigation report* produced for a *project* by the *project geologist.*

project: Any *structures for human occupancy*, or any subdivision of land that contemplates the eventual construction of *structures for human occupancy*. For a structure in existence prior to May 4, 1975, if an addition or alteration to that structure exceeds 50% of the value of that structure, then it is considered a *project*. Unless a *lead agency* imposes more stringent requirements, single family frame dwellings are exempt unless part of a permitted development of four or more dwellings (California Public Resources Code, Division 2, Chapter 7.5, Section 2621.6.).

setback: The mitigation technique for *surface fault rupture* that avoids placing structures across traces of *Holocene-active faults* and may include *age-undetermined faults*.

single-family dwelling: A single family dwelling is a residence that houses one family or household, or one that is designed for one family only.

State Geologist: The head of the California Geological Survey.

State Mining and Geology Board: The state entity responsible for developing regulations that provide guidance to *lead agencies* and the geologic community in complying with the *Alquist-Priolo Earthquake Fault Zoning Act*. The State Mining and Geology Board, together with the *State Geologist*, also participates in the review process of *Earthquake Fault Zone Maps*.

story: "That portion of a building included between the upper surface of any floor and the upper surface of the floor next above, except that the topmost story shall be that portion of the building included between the upper surface of the topmost floor and the ceiling or roof above. For purpose of the Act and this subchapter, the number of stories in a building is equal to the number of distinct floor levels, provided that any levels that differ from each other by less than two feet shall be considered as one distinct level" (California Code of Regulations Title 14, Division 2, Section 3601.(f)).

structure for human occupancy: "any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year" (California Code of Regulations, Title 14, Division 2, Section 3601 (e)).

surface fault rupture: The displacement on a *fault* that occurs at the surface of the earth.

waiver: If a *lead agency* finds that no undue hazard of surface fault rupture exists for a *project*, a waiver of the requirement of a *fault investigation* may be granted by the *lead*

agency with the approval of the *State Geologist* (California Public Resources Code, Division 2, Chapter 7.5, Section 2623.(a))

1.2 Acronyms

A-P Act: Alquist – Priolo Earthquake Fault Zoning Act

CCR: California Code of Regulations

CGS: California Geological Survey

CPRC: California Public Resources Code

EFZ: Earthquake Fault Zone

EZRIM: Earthquake Zones of Required Investigation Map

GIS: Geographic Information System

lidar: Light Detection and Ranging

SMGB: State Mining and Geology Board

SECTION 2: INTRODUCTION (FOR ALL AUDIENCES)

Note: Terms in *italics* are defined in Section 1, Definitions and Acronyms

2.1 Section Outline

2.2 Objectives of these Guidelines.
2.3 How to use these Guidelines.
2.4 What is *surface fault rupture* and why is it a hazard?
2.5 The *Alquist-Priolo Earthquake Fault Zoning Act*.
2.6 Rationale for zoning *Holocene-active Faults*.
2.7 Roles and responsibilities under the *Alquist – Priolo Earthquake Fault Zoning Act*.
2.8 Uses and limitations of *Earthquake Fault Zone Maps*.
2.9 How to determine if a *project* is regulated by the *Alquist – Priolo Earthquake Fault Zoning Act*?
2.10 Relationship of these Guidelines to local General Plans and permitting ordinances.
2.11 Relationship of these Guidelines to the CEQA process and other site investigation requirements.
2.12 References.

2.2 Objectives of these Guidelines

The objectives of these Guidelines are two-fold:

1. To promote uniform and effective statewide implementation of the evaluation and mitigation elements of the *Alquist-Priolo Earthquake Fault Zoning Act*.
2. To assist affected parties in the evaluation and mitigation of *surface fault rupture* hazard for *projects* within designated *Earthquake Fault Zones*.

2.3 How to use these Guidelines

This document is intended to assist multiple audiences: *Lead agencies*, *project geologists and reviewing geologists*, as well as property *owners/developers*. Each audience has a different role with respect to the *A-P Act* and this publication is designed with sections targeted to these specific audiences so that pertinent information can be easily accessed as indicated by the section titles. *Lead agencies* will find these Guidelines useful for understanding how to implement the *A-P Act* and associated regulations. *Owners/developers* will find this document useful to understand how the *A-P Act* applies to them for their *projects* within *EFZs*. Finally, for *professional geologists*, which includes the *project geologist* and *reviewing geologist,* these Guidelines are intended to summarize the current state-of-practice for *fault investigations* conducted under the *A-P Act*.

This document is not necessarily designed to be read linearly, but rather the reader should be directed to the sections based on who they represent within the structure of the *A-P Act*: *Lead agency* (Section 3)*, owner/developer* (Section 4)*, and professional*

geologists (Sections 5 and 6). Flow charts and illustrative figures are utilized in this document in order to simplify the seemingly complex language of the *A-P Act* and associated regulations. Terminology specific to the *A-P Act* and regulations are defined in Section 1: Definitions and Acronyms and defined terms are *italicized* throughout the document for easy reference.

The methods, procedures, and references contained herein are those that the Technical Advisory Panel compiled for this update and believe are currently representative of quality state-of-practice. *Surface fault rupture* hazard assessment and *mitigation* is an evolving field and it is recognized that additional approaches and methods will be developed.

2.4 What is *surface fault rupture* and why is it a hazard?

Surface fault rupture is the result of *fault* movement that breaks to the surface of the earth either suddenly during earthquakes (Figure 2-1), or slowly due to a process known as fault creep, and is the result of tectonic movement that originates deep in the Earth. *Surface fault rupture* is different from other types of earthquake-related ground deformation, such as that caused by soil liquefaction or earthquake-triggered landslides. The energy released during an earthquake is a direct result of fault rupture at depth, and when that rupture extends to the ground surface it manifests as displacements expressed as fractures, fissures and related tectonic deformation. The release of energy during an earthquake will also cause shaking which can trigger liquefaction and landslides.

Surface fault rupture poses a hazard to structures and infrastructure because the displacement that occurs, where one side of the fault moves relative to the other, can severely damage buildings (Figure 2-2). In extreme cases, this damage can result in the structural collapse of a building, potentially resulting in injuries or loss of life. In less extreme cases, structural damage may render a building uninhabitable and require costly repairs (Figure 2-2b). This hazard became widely recognized following the 1971 San Fernando (also known as the Sylmar) earthquake, where damage to many buildings was attributed to *surface fault rupture* (Youd and Olsen, 1971; Yerkes, 1973). Since 1971, other earthquakes around the world have continued to demonstrate the potential for extensive damage to structures caused by *surface fault rupture* and the hazard it poses to life and property.

2.5 The *Alquist-Priolo Earthquake Fault Zoning Act*

The purpose of the *Alquist-Priolo Earthquake Fault Zoning Act* (hereafter referred to simply as the "*A-P Act*") is to address the hazard of *surface fault rupture* through the regulation of development in areas near *Holocene-active faults*. As a result of the 1971 San Fernando earthquake and the recognition that *surface fault rupture* poses a hazard to structures, the *Alquist-Priolo Earthquake Fault Zoning Act* was signed into law on December 22, 1972, and went into effect on March 7, 1973. The complete text of the *A-P Act* is provided in Appendix A and relevant portions are included throughout the body of this document.

Figure 2-1. Example of *surface fault rupture* from the M 6.0 August 24, 2014 South Napa earthquake. Displacement at this location was about 0.5 meters (1.6 feet).

Figure 2-2a-b. 2a. Impact of *surface fault rupture* on a home during the November 14, 2016 M 7.8 Kaikoura earthquake, New Zealand. Fault displacement at this location was about 10 meters (33 feet) of horizontal offset. Photo credit: Pilar Villamor, GNS Science / Earthquake Commission. 2b. House damaged by surface rupture during the August 14, 2014 M 6.0 South Napa earthquake. Total displacement on the fault was less than 1 foot, yet even relatively modest amounts of fault offset required expensive (>$100,000) repairs including the replacement of the foundation of the house. Red arrows show relative trend of faulting and sense of horizontal movement.

The purpose of the *A-P Act* is to prevent the construction of *structures for human occupancy* across traces of active faults (California Public Resources Code (CPRC), Division 2, Chapter 7, Section 2621.5). For purposes of the *A-P Act*, active faults are defined by the *State Mining and Geology Board (SMGB)* as those faults that have *"…had surface displacement during Holocene time…"*[1] (California Code of Regulations (CCR), Title 14, Division 2, Section 3601 (a)). In order to provide clarity regarding the term active fault, this document uses the term *Holocene-active fault* to describe faults that are specifically regulated by the *A-P Act*. Additionally, this document considers the Holocene as the geological epoch that began 11,700 years before present, as defined by the International Commission on Stratigraphy (http://www.stratigraphy.org).

It is important to note that the *A-P Act* only addresses the hazard of *surface fault rupture* for *Holocene-active faults*; faults that have moved prior to the Holocene, referred to in this document as *Pre-Holocene faults*, may also have the potential to rupture but are not addressed by the *A-P Act*. Additional discussion regarding *Holocene-active faults,* as well as *pre-Holocene faults,* can be found in Section 5. Additionally, the *A-P Act* only addresses the hazard of *surface fault rupture* and not other types of earthquake-caused ground deformation such as from liquefaction and earthquake-induced landslides. These other types of earthquake-induced hazards are addressed by the Seismic Hazards Mapping Act (CPRC , Division 2, Chapter 7.8, Sections 2690 – 2699.6).

2.6 Rationale for zoning *Holocene-active Faults*

The decision to include *Holocene-active faults* in *Earthquake Fault Zones* (*EFZ*) was made in the 1970's soon after the zoning program started. The concept is based on the observation that faults that have shown relatively recent rupture are typically those with short recurrence intervals (the time elapsed between significant earthquakes) and therefore have a higher likelihood of rupturing again in the near-future. This approach is deterministic and provides a relatively simple metric and reasonable threshold for *project geologists* conducting *fault investigations* and *lead agencies* reviewing those investigations, but it is not perfect. In particular, some faults and fault systems with long recurrence intervals are problematic using this deterministic approach. For example, a fault with a 12,000 to 13,000-year recurrence interval that has not ruptured in the Holocene might not be included in an *EFZ*, while a fault that has a 30,000-year recurrence that ruptured 500 years ago would be included. In the former case, where the fault might be near failure and more likely to produce a large earthquake, the *A-P Act* does not account for a higher probability that the fault might rupture in the near future. In the latter case, the *A-P Act* is similarly blind to relative probability; some might consider the fault unlikely to produce another earthquake, therefore is unlikely to be a significant hazard for structures built on or near it. In the administration of the *A-P Act*, a *lead agency* might prohibit the construction of *structures for human occupancy* across the latter fault that

[1] The current SMGB regulations states that the Holocene epoch is "…about the last 11,000 years" (CCR, Title 14, Division 2, Section 3601 (a)). However, while the SMGB definition has been essentially unchanged since 1974, the age of the Holocene epoch has since been refined through geological studies (e.g., Walker and others, 2009) and is currently recognized as starting about 11,700 years ago. A recommendation to update the SMGB definition of Holocene has been forwarded by the SP42 Technical Advisory Panel to the SMGB for consideration.

ruptured 500 years ago, while there would be no such prohibition, or even the requirement for a *fault investigation* for that matter, across the potentially more dangerous former fault that has not ruptured in the Holocene.

The state-of-the-science in paleoseismic work in California is such that there is rarely enough detailed knowledge of the recurrence intervals of faults that rupture frequently, and even less for those with moderate to long recurrence intervals. To develop this higher level of information on any given fault requires detailed paleoseismic research at sites with ideal stratigraphic conditions that allow the recognition and dating of multiple earthquake events. The ability to develop site-specific data to address earthquake recurrence is difficult, as most sites where development is proposed are not amenable to these types of studies. Additionally, such detailed paleoseismic studies are beyond the scope and cost constraints of most development projects. In summary, the Holocene-active age criteria provide a practical approach to addressing fault rupture hazards for public safety.

2.7 Roles and responsibilities under the *Alquist – Priolo Earthquake Fault Zoning Act*

Three entities are responsible for the administration and implementation of the *A-P Act*: The *State Geologist*, the *lead agency,* and the *State Mining and Geology Board*. The property *owner/developer* represents a fourth group that is impacted most directly by the *A-P Act*. Figure 2-3 summarizes the roles and responsibilities of each of these groups.

The *State Geologist* (Chief of the California Geological Survey) is required by the *A-P Act* to delineate *Earthquake Fault Zones* (*EFZ*) along known *Holocene-active faults* in California. The *EFZs* are distributed as *Earthquake Fault Zone maps* (Figure 2-4), as well as Geographic Information System (GIS) shapefiles. The zones are regulatory in nature, and are one class of *Earthquake Zones of Required Investigation*, which include other geologic hazards such as liquefaction and earthquake-induced landslides (Figure 2-4c). Any proposed *projects* within these *EFZ* must address the potential for *surface fault rupture* through a *fault investigation* prior to a permit being issued by the *lead agency*. The *EFZs* are intended to encompass *Holocene-active* and potentially *Holocene-active faults* that may exist in the vicinity of the mapped faults used to establish the *EFZs*. The *EFZs* are provided by *CGS* to affected *lead agencies* in the form of GIS Shapefiles, which constitute the official regulatory *EFZs*. CGS also provides an interactive web application that uses a statewide parcel database to identify individual properties affected by *EFZ*s (https://maps.conservation.ca.gov/cgs/EQZApp/) and provides *EFZ*s as GIS web services to lead agencies and other institutional users: https://spatialservices.conservation.ca.gov/arcgis/rest/services/CGS_Earthquake_Hazard_Zones.

Other products CGS produces include digital images of the *EFZ* maps, provided on a 1:24,000-scale U.S. Geological Survey topographic base map in a portable document format (PDF), which can be used as reference maps by interested parties without access

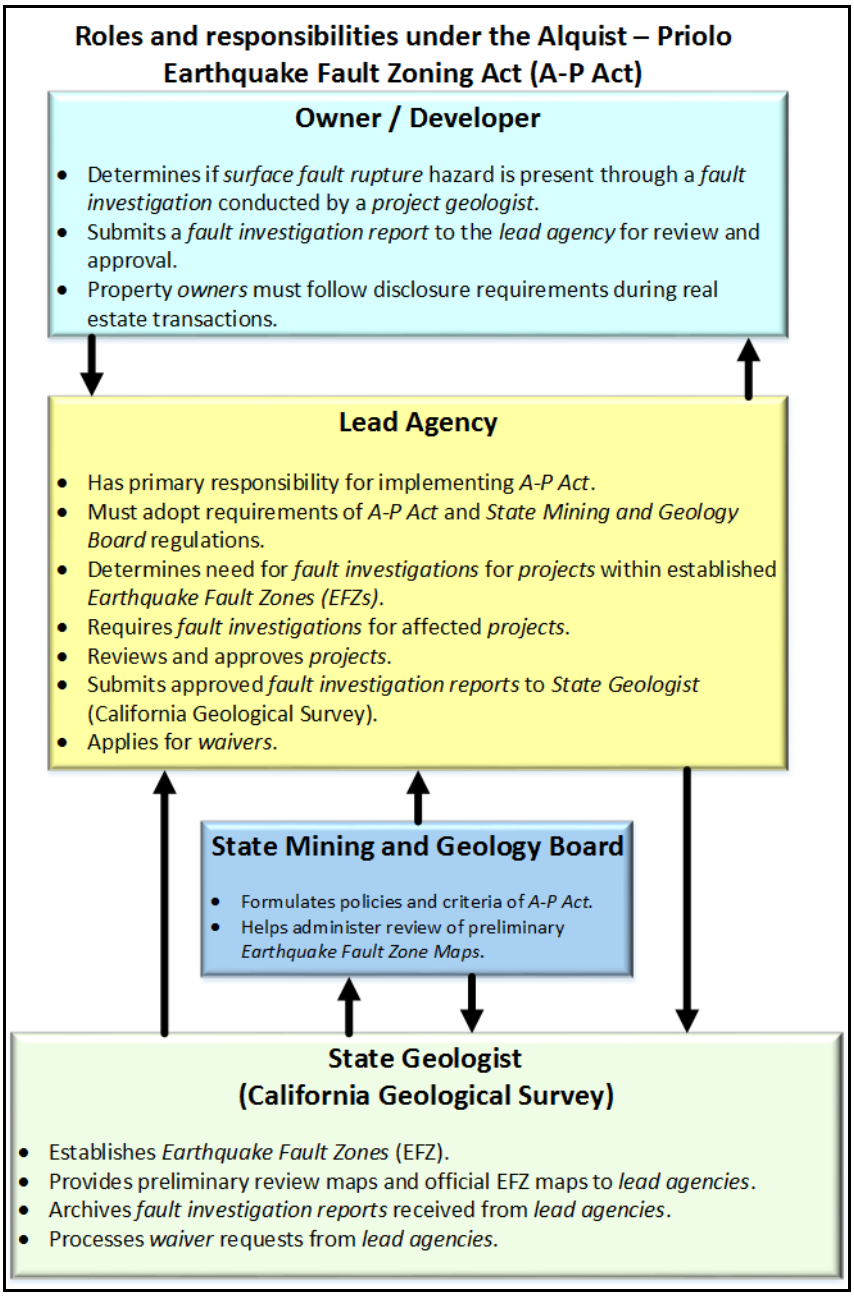

Figure 2-3. Bulleted items represent the primary roles and responsibilities of the four groups engaged in the *Alquist - Priolo Earthquake Fault Zoning Act*.

to a GIS platform. Appendix C describes the criteria and methods CGS uses to compile *Earthquake Fault Zone Maps*.

Lead agencies affected by the *EFZs* must regulate certain development *projects* within the zones. Before a *project* within an *EFZ* can be permitted, the *lead agency* must require a *fault investigation*. Section 3 more fully describes the role of the *lead agency* in the implementation of the *A-P Act*. Section 5 is a discussion regarding the current state-

of-practice for *fault investigations* as applied to the *A-P Act* and will be of interest to the *reviewing geologists* for local *lead agencies*. Both the *project geologist* retained by the *owner/developer* and the *reviewing geologist* representing the *lead agency* should be familiar with Section 5 in order to have a common frame of reference during the review process.

Owner/Developers are the group most directly impacted by the *A-P Act* as they bear the cost of site-specific *fault investigations* and may be required to revise development plans to avoid construction on *Holocene-active fault* traces. If a *project* proposed by an *owner/developer* is located within an *EFZ*, a *fault investigation* will need to be conducted by a *project geologist*, and the *fault investigation report,* produced as part of this study, will need to be reviewed by the *lead agency's reviewing geologist*. *Owner/Developers* are referred to Section 4 of this document, which contains additional information pertinent to the *owner/developer* of *projects* within *Earthquake Fault Zones*.

Finally, the *State Mining and Geology Board* (SMGB) provides additional regulations (Policies and Criteria) to guide *lead agencies* in their implementation of the *A-P Act* (CCR, Title 14, Div. 2, Chapter 8.1.3). These regulations are included in Appendix B and are incorporated where appropriate in the body of this document. The SMGB also plays a role in the review of preliminary *Earthquake Fault Zone Maps*, and is responsible for receiving public review comments, forwarding these comments to the *State Geologist* for consideration of changes to the *Earthquake Fault Zone Maps*, as well as conducting public hearings regarding the preliminary review maps. The Geohazards Committee of the SMGB assisted in the development of this revision to Special Publication 42.

2.8 Uses and Limitations of *Earthquake Fault Zone Maps*

Earthquake Fault Zones (EFZ) are delineated to define those areas where *fault investigations* are required prior to building *structures for human occupancy*. The *Earthquake Fault Zone maps* include both the *EFZ* (Figure 2-4a) as well as the mapped traces of faults that are used to delineate zone boundaries (Figure 2-4b). These fault traces are plotted as accurately as the sources of data permit; however, no degree of the relative potential for future surface displacement or hazard is implied for the faults shown on the *EFZ maps*.

Fault traces shown on *Earthquake Fault Zone maps* are not mapped at a scale suitable to meet the requirement for site-specific *fault investigations*, nor should the faults depicted be used as the basis for defining building *setback* requirements. *Lead agencies* must require *owners/developers* with *projects* within the *EFZ* to determine if a potential hazard from any *fault,* whether heretofore recognized or not, exists with regard to proposed structures.

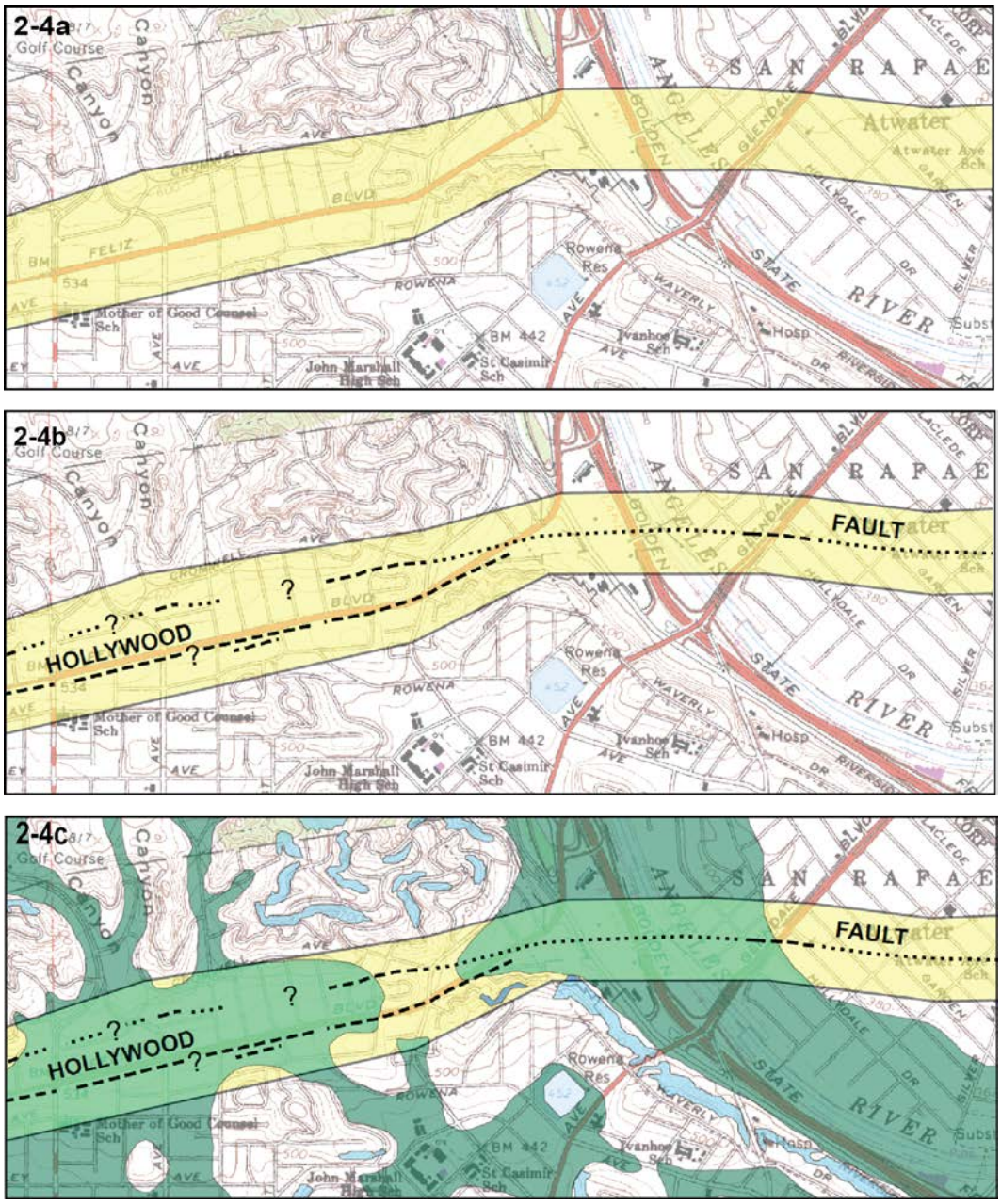

Figure 2-4. Portion of and *Earthquake Fault Zone* (EFZ) map on the Hollywood Fault from the Hollywood 7.5-minute Quadrangle. 4a. EFZ is shown as the yellow polygon. This is the default view for recent EFZ maps, available as downloadable files in Portable Document Format (pdf). 4b. *Earthquake Fault Zone* map showing both EFZ (yellow polygon) and faults (black lines). Faults can be toggled on using the layer control in Adobe Acrobat®. Solid lines - Accurately located; Long dashed lines - Approximately located; Short dash lines - Inferred; Dotted lines - Concealed. 4c. Map showing all *Earthquake Zones of Required Investigation*. Blue areas are zones for earthquake-induced landslides; Dark green areas are for liquefaction zones. Lighter green areas are zones with overlapping *Earthquake Fault Zones* and liquefaction zones.

Faults with the potential to rupture the ground surface, which include both *Holocene-active* and *pre-Holocene faults*, may exist outside the *EFZ* depicted on an *Earthquake Fault Zone map*. If a *Holocene-active* fault is found outside of an EFZ, for example, during a site-specific geologic investigation, that fault must still be avoided according to the *A-P Act*. *Pre-Holocene faults* outside of established *Earthquake Fault Zones* are not regulated by the *A-P Act*, although an evaluation by a *project geologist,* which may include a *fault investigation,* is recommended for all critical and significant developments proposed outside established *EFZs,* where there is an indication from available mapping and geologic data that *surface fault rupture* presents a potential hazard to a *project*.

2.9 How to determine if a *project* is regulated by the *Alquist – Priolo Earthquake Fault Zoning Act*?

Determining if a *project* is regulated by the *A-P Act* requires asking a number of questions, the first of which is "Is the *project* located within a regulatory *Earthquake Fault Zone*?" This question is best answered by contacting the *lead agency* (typically the local city or county) which can determine if a parcel within its jurisdiction is located within an *Earthquake Fault Zone (EFZ)*. Alternatively, the CGS regulatory zone web service (https://maps.conservation.ca.gov/cgs/EQZApp/) can provide guidance if a parcel is in, or near an *Earthquake Fault Zone*. If the answer is "yes," then several additional questions must be asked in order to determine if the *project* is regulated by the *A-P Act*. The subsequent questions are dependent on additional criteria such as the type of development, characteristics of the proposed or existing structure, the value of existing structures if they are being renovated, as well as consideration of any local regulations. Plate 1 is a flow chart intended to aid the *owner/developer* and the *lead agency* in determining if a *project* is regulated by the *A-P Act*.

2.10 Relationship of these Guidelines to Local General Plans and Permitting Ordinances

The CPRC, Division 2, Section 2621.5 describes the purpose of the *A-P Act* is to provide for the adoption and administration of zoning laws, ordinances, rules, and regulations by cities and counties in implementation of the general plan that is in effect. Similarly, the CCR, Title 14, Division 2, Chapter 8.1, Section 3603 directs affected *lead agencies* to provide for disclosure of delineated *Earthquake Fault Zones (EFZ)* to the public and that such disclosure may be by reference in general plans, specific plans, property maps, or other appropriate local maps. Cities and counties should consider the information presented in these guidelines when adopting or revising these plans and ordinances.

It is recognized that lead agencies need to develop local policies and regulations regarding the A-P Act and existing policies and regulations should be routinely reviewed and, if necessary, updated. Appendix D provides web links to several *lead agency* implementations of the *A-P Act* and is provided to assist *lead agencies* in these responsibilities.

2.11 Relationship of these Guidelines to the CEQA Process and Other Site Investigation Requirements

Nothing in these guidelines is intended to negate, supersede, or duplicate any requirements of the California Environmental Quality Act (CEQA) or other state laws and regulations. At the discretion of the *lead agency*, some or all of the investigations required by the *A-P Act* may occur either before, concurrent with, or after the CEQA process or other processes that require site investigations.

For hospitals, public schools, and essential service buildings, additional requirements are prescribed by the California Building Code (California Code of Regulations (CCR), Title 24). For such structures, the requirements of the *A-P Act* apply, with additional requirements specific to these types of structures specified in CCR Title 24.

2.12 References

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Yerkes, R. F., 1973, Effect of San Fernando earthquake as related to geology, in San Fernando, California, Earthquake of February 9, 1971, U.S. Dept. of Commerce, Washington, D.C.

SECTION 3: GUIDELINES FOR LEAD AGENCIES

Note: Terms in *italics* are defined in Section 1, Definitions and Acronyms

3.1 Section Outline

3.2 *Lead agency* responsibilities under the *Alquist - Priolo Earthquake Fault Zoning Act*.

3.3 *Lead agency* roles and responsibilities in the review of Preliminary *Earthquake Fault Zone Maps* and release of Official *Earthquake Fault Zone Maps*.

3.4 When is a *project* regulated by the *Alquist-Priolo Earthquake Fault Zoning Act*?

3.5 *Lead agency* roles and responsibilities in the implementation and enforcement of the *Alquist-Priolo Earthquake Fault Zoning Act*.

3.6 *Fault investigation report* filing requirements.

3.7 *Waiver* process: What is it? When should it be initiated? And how?

3.8 Safety element updates and local hazard mitigation plans.

3.2 *Lead agency* responsibilities under the *Alquist - Priolo Earthquake Fault Zoning Act*

This section is intended to provide an overview regarding the role of affected *lead agencies*, which are responsible for the implementation and enforcement of the *Alquist-Priolo Earthquake Fault Zoning Act* (*A-P Act*) within their jurisdictions. This section is not meant to be comprehensive but is intended to highlight the more important roles and responsibilities of *lead agencies*. *Lead agencies* should review and understand the text of the *Alquist-Priolo Earthquake Fault Zoning Act*, as well as the policies and criteria of the *State Mining and Geology Board* (SMGB), which are reproduced in Appendices A and B of this document. Nothing within this document is intended to supersede either the *A-P Act* or the policies of the SMGB.

Lead agencies (Cities, Counties and State agencies) have three primary responsibilities under the *A-P Act* which include:

1. Responsibility for adoption and administration of zoning laws, ordinances, rules, and regulations in the General Plan of any city or county affected (California Public Resources Code (CPRC), Division 2, Chapter 7.5, Section 2621.5).
2. Regulating specified "*projects*" within *Earthquake Fault Zones* (CPRC, Division 2, Chapter 7.5, Section 2623).
3. Other administrative requirements under the *A-P Act* such as posting public notices of new *Earthquake Fault Zone Maps* (CPRC, Division 2, Chapter 7.5, Sections 2621.9 and 2622 (d)), initiating *waiver* requests (Section 2623), and filing approved *fault investigation reports* with the *State Geologist* (Section 2625).

In practice, these specific requirements can be described as a linear progression starting from when: 1) The Preliminary Earthquake Fault Zone (EFZ) maps are released to the *lead agency* by the *State Geologist*; 2) The enforcement of the *A-P Act* by the *lead*

agency once Official *EFZ Maps* are released; and 3) Compliance by the *lead agency* with other administrative requirements of the *A-P Act*. These topics are discussed in further detail in the following sections.

3.3 *Lead agency* roles and responsibilities in the review of Preliminary *EFZ* Maps and release of Official *EFZ* Maps

As provided in the *A-P Act*, a *lead agency* is responsible for the implementation and administration of the *A-P Act* and associated *SMGB* regulations. This is done through the adoption of a local ordinance into the *lead agency*'s general plan. Appendix D contains links to examples of local ordinances by some lead agencies in California and Utah, another state with significant fault rupture hazards. The examples in Appendix D are intended to assist other lead agencies in developing or updating their safety elements, ordinances, policies, and other documents to better implement the *A-P Act*.

A *lead agency*'s role in the day-to-day administration of the *A-P Act* typically begins upon issuance of Preliminary *Earthquake Fault Zone Maps* by the *State Geologist*. The *State Geologist* is required to provide an affected *lead agency* proposed new and revised *EFZ Maps* for its review and comment prior to the issuance of the Official *Earthquake Fault Zone maps*. These Preliminary *EFZ Maps* are released to the *lead agency* and the public to solicit technical comments on the proposed *EFZ*s. Once the Preliminary *EFZ Maps* are issued, the *lead agency* has 90 days to submit all technical comments to the *SMGB*, which then forwards those comments to the *State Geologist* for consideration in revisions to the Official *Earthquake Fault Zone Maps*. In practice, the *lead agency* will typically have its *reviewing geologist* review the Preliminary *EFZ Maps* as well as the supporting materials such as CGS Fault Evaluation Reports that justify the establishment of the *EFZ*s. CPRC, Division 2, Chapter 7.5, Sections 2622 (b) and (c) of the *A-P Act* describe the requirements of the review and comment period and issuance of the Official *Earthquake Fault Zone Maps*.

The *SMGB* also has additional regulations regarding the review of Preliminary *EFZ Maps*, which are in Section 3602 of the California Code of Regulations (CCR), Title 14, Division 2, Chapter 8.1.3 (see Appendix B). *SMGB* regulations require that the *lead agency* give public notice of receipt of the Preliminary *EFZ Map*s to property *owners* within the proposed *EFZ*s by reasonable means of communication within 45 days following the issuance of Preliminary *EFZ Maps*. CCR, Title 14, Division 2, Chapter 8.1.3, Section 3602 also suggests the *lead agency* give notice to *professional geologists* who conduct *fault investigations*. This provision is intended to solicit additional technical comments from *professional geologists* who are familiar with the local area and may be aware of additional data that should be considered for the establishment of the *EFZ*s. All public comments should be sent directly to the *SMGB* by the end of the 90-day public comment period. The *SMGB* is then responsible for forwarding the comments to the *State Geologist* for consideration in any revisions to the proposed *EFZ*s. Finally, during the 90-day comment period, the *SMGB* is required to hold at least one public hearing on the proposed *EFZ Maps*. This public meeting is typically, but not required to be, conducted in a local jurisdiction affected by the proposed *EFZ*.

After the 90-day public comment period and upon receipt of the comments by the *State Geologist*, the *State Geologist* has 90 days to consider the comments, incorporate necessary revisions, and release the Official *Earthquake Fault Zone Maps* to the *lead agency* affected by the *Earthquake Fault Zones*. Upon receipt of the Official maps, the *lead agency* is required to post a public notice at the county recorder, county assessor, and county planning commission offices, identifying the location of the *EFZ map* and effective date (CPRC, Division 2, Chapter 7.5, Section 2622 (d), see Appendix A).

3.4 When is a *project* subject to the *Alquist-Priolo Earthquake Fault Zoning Act*?

The *lead agency* ultimately is responsible for determining whether a *project* lies within an *Earthquake Fault Zone*. When the Official *EFZ*s are released, the *State Geologist* provides the *lead agency* with GIS files of *Earthquake Fault Zones*, which the *lead agency* can overlay with its official parcel boundary maps to determine whether a *project* lies within an *EFZ*. Alternatively, the *lead agency* can access CGS's GIS web services for the most recent version of the *EFZ*: https://spatialservices.conservation.cagov/arcgis/rest/services/CGS_Earthquake_Hazard_Zones. With certain exceptions, a *project* located within an *Earthquake Fault Zone* and regulated by the *A-P Act* generally includes new *structures for human occupancy*, as well as subdivisions of land that will eventually include *structures for human occupancy*. *Projects* exempted by the *A-P Act* are dependent on additional criteria such as the type of development, characteristics of the proposed or existing structure, and the value of existing structures if they are being renovated. Plate 1 is a decision flow chart intended to aid *lead agencies* and *owner/developers* in determining if a *project* within an *EFZ* requires a *fault investigation* under the provisions of the *A-P Act*.

3.5 *Lead agency* roles and responsibilities in the implementation and enforcement of the *Alquist-Priolo Earthquake Fault Zoning Act*

Once an Official *Earthquake Fault Zone Map* is released by the *State Geologist*, the primary role of the affected *lead agency* is to require and review *fault investigations* that address the hazard of *surface fault rupture* for any proposed *projects* within *EFZ*s before issuing a construction permit. The approval of those *projects* must be in accordance with the policies and criteria established by the *SMGB* (CPRC, Division 2, Chapter 7.5, Section 2623 (a)). *SMGB* regulations require that *fault investigation reports* must be prepared by a *professional geologist* registered in the State of California (CCR, Title 14, Division 2, Chapter 8.1.3, Section 3603 (d)), referred to in this document as the *project geologist*. These reports must also be reviewed by the *lead agency* (or its designee) and this review must be conducted by a *professional geologist* registered in the State of California, referred to in this document as the *reviewing geologist*. Plate 2 is a decision flow chart to help determine if a *fault investigation report* meets the minimum requirements of the *A-P Act*. Sections 5 and 6 in this publication, intended for *project geologists* and *reviewing geologists*, discuss in further detail the technical aspects and expectations of *fault investigations* and the content of *fault investigation reports*.

The *A-P Act* contains other important provisions relevant to the *lead agency*. First, a *lead agency* may impose and collect reasonable fees on individual *projects* in order to

recover the costs of administering and complying with the *A-P Act* (CPRC, Division 2, Chapter 7.5, Section 2625). Second, a *lead agency* may establish policies and criteria that are more stringent than those of the *A-P Act* and the policies of the *SMGB*. A *lead agency* may simply adopt the minimum standards required by the *A-P Act* and *SMGB* regulations, as well as impose additional requirements, often included in the General Plan or local ordinances. Appendix D includes several ordinances, guidelines and other documents from *lead agencies* around the state that represent their implementation of the *A-P Act*. A *lead agency* that lacks local ordinances regarding geologic hazards in general and earthquake hazards in particular, or whose ordinances have become outdated, is encouraged to use the information contained in this publication to prepare or update these documents.

Enforcement of the *A-P Act* is solely the responsibility of the *lead agency*. Failure to comply with the requirements of the *A-P Act* can, under some circumstances, incur liability on the part of the *lead agency* in the event of earthquake-related injuries or death (CPRC, Division 2, Chapter 7.5, Section 2621.8).

3.6 *Fault investigation report* filing requirements

CCR, Title 14, Division 2, Chapter 8.1.3, Section 3603 (f) requires cities and counties to submit one copy of each approved *fault investigation report* to the *State Geologist* within 30 days of report approval and the *State Geologist* is required to place these reports "on open file." These reports of site-specific *surface fault rupture* hazard investigations serve several purposes: CGS uses the information provided in these reports to revise existing *EFZ Maps* when enough new information becomes available. When evaluating the requirements for a new *project* within an *EFZ*, *lead agencies*, *owner/developers*, and *project geologists* can refer to *fault investigation reports* that have been submitted to CGS using an online map service:

https://spatialservices.conservation.ca.gov/arcgis/rest/services/CGS

In some cases, the body of existing *fault investigation reports* in an area could provide the basis for the *waiver* process (see below).

Fault Investigation Reports in digital formats, such as a portable document file (PDF), can be sent by email to SHMP@Conservation.ca.gov if they are no larger than 10 MB. Larger files can be uploaded by the *lead agency* to a CGS server following the instructions described at:
http://www.conservation.ca.gov/cgs/rghm/ap/Pages/Index.aspx

Reports can also be sent by mail to:

California Department of Conservation
California Geological Survey
Attn: Earthquake Fault Zone Reports
801 K Street, MS 12-31
Sacramento, CA 95814-3531

3.7 *Waiver* process: What is it? When should it be initiated? And how?

The *A-P Act* contains a provision for a *waiver* process by which the requirement for *fault investigation reports* can be waived for *projects*, with approval of the *State Geologist* (CPRC Division 2, Chapter 7.5, Section 2623). To initiate the *waiver* process, the *lead agency* must first find that no undue hazard related to *surface fault rupture* exists for a *project*. If this is the case, then the *lead agency* is responsible for initiating the *waiver* request and provide supporting documentation to the *State Geologist*, who will direct CGS staff to conduct a review of the supporting data and recommend the *waiver* request be approved or denied based on the findings of the review.

In practice, the *waiver* process is typically only initiated for *projects* where enough locally-generated geologic data exists in the surrounding area to ensure that the site is effectively "cleared" of *Holocene-active faults* and *age-undetermined faults*. Supporting documents submitted by the *lead agency* may include *fault investigation reports* conducted for other *projects* in the surrounding vicinity and these reports should demonstrably show that faults do not project to the site of interest. If a *lead agency* is interested in initiating the *waiver* process, they are encouraged to contact the Seismic Hazards Program Manager at the California Geological Survey to discuss the process and requirements prior to submitting a *waiver* request (SHMP@conservation.ca.gov).

3.8 Safety element updates and local hazard mitigation plans

A *lead agency* should use the most up-to-date *EFZ* data for updates to its General Plan Safety Element, as well as in other land use planning and zoning documents. The California Office of Emergency Services (Cal OES), in cooperation with the California Natural Resources Agency and CGS, have built a convenient online map service (http://myplan.calema.ca.gov) to assist the *lead agency* in preparing these updates. The *lead agencies* can use this website to display various earthquake, fire and flood hazards, upload local map information, and prepare custom maps for use in local jurisdiction planning documents, such as General Plan Safety Elements and Local Hazard Mitigation Plans.

CGS also has a variety of online map services in addition to those provided to Cal OES for the MyPlan website. *Lead agencies* are encouraged to contact the CGS Seismic Hazard Program Manager (SHMP@conservation.ca.gov) to see what custom products can be prepared to assist in updating these important planning documents.

SECTION 4: GUIDELINES FOR PROPERTY OWNERS AND DEVELOPERS

Note: Terms in *italics* are terms defined in Section 1, Definitions and Acronyms

4.1 Section Outline

4.2 Objectives of this section.
4.3 Is my *project* regulated by the *Alquist-Priolo Earthquake Fault Zoning Act*?
4.4 What does it mean to be located within an *Earthquake Fault Zone*?
4.5 Steps that the *owner/developer* must take for a *project* to comply with the *A-P Act*.
4.6 Real estate disclosure requirements.

4.2 Objectives of this section

Within the framework of the *Alquist-Priolo Earthquake Fault Zoning Act* (*A-P Act*), it is the *owner/developer* who is most directly affected by the regulations associated with the *A-P Act*. The *owner/developer* (or their agent) must work with the local *lead agency* in order to understand if the *project* is subject to the *A-P Act* and, if it is, how to comply with the law. Furthermore, it is the *owner/developer* who must hire a *project geologist* to conduct the *fault investigation*, and submit a *fault investigation report* to the *lead agency* for review. Therefore, it is important that the *owner/developer* have a basic understanding of the *A-P Act* to ensure compliance and to facilitate approval of the *project* by the *lead agency*.

4.3 Is my *project* regulated by the *Alquist-Priolo Earthquake Fault Zoning Act*?

Determining if a *project* is regulated by the *A-P Act* requires first asking: "Is the *project* located within a regulatory *Earthquake Fault Zone*?" This question is best answered by contacting the *lead agency* (typically the local city or county, or other permitting entity) that can determine if a parcel within their jurisdiction is located within an *Earthquake Fault Zone* (*EFZ*). *Lead agencies* should be the first place to go for this information because they will have the most up-to-date parcel information and can identify any local hazards or zones not addressed by the *EFZ*. *EFZ*s are provided by CGS to affected *lead agencies* in the form of geographic information system (GIS) shapefiles, which constitute the official *EFZ*s. These GIS files, as well as portable document format (PDF) files for those without GIS software, are available for download from the CGS Information Warehouse (http://maps.conservation.ca.gov/cgs/informationwarehouse/). CGS also provides an interactive web application that uses a statewide parcel database to identify individual properties affected by EFZs: https://maps.conservation.ca.gov/cgs/EQZApp/ This web application provides a convenient, though possibly less up-to-date, way to determine if a project site is regulated by the *A-P Act*. Because this information may not be up-to-date, the *lead agency* should always make the final determination if a *project* is within and *Earthquake Fault Zone*. Figure 4.1 shows examples of hypothetical *projects* within, outside, and near an *Earthquake Fault Zone* as depicted on an *Earthquake Fault Zone Map*.

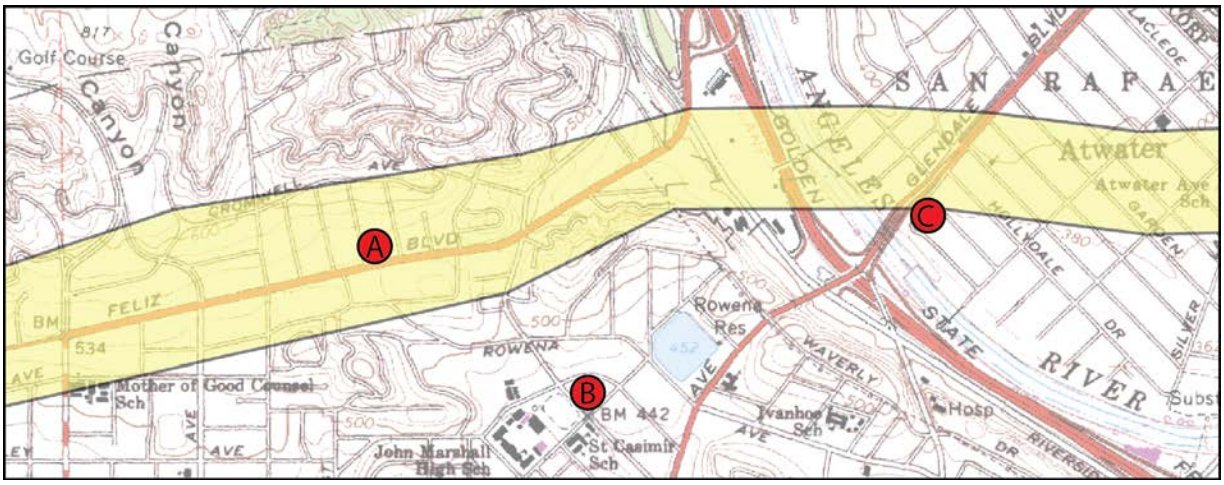

Figure 4-1. Illustration of *projects* (red circles) in, outside, or near, an *Earthquake Fault Zone (EFZ),* shown as the yellow shaded area. Site A (red circle with letter A) is within the *EFZ*, Site B is outside of the *EFZ* and Site C is near the *EFZ*. In this example, Site A would be regulated by the *A-P Act* and Site B is not regulated by the *A-P Act*. For Site C the *lead agency* should be consulted to determine if the *project* is located within the *EFZ*. The *EFZ* map is a portion of the Hollywood 7.5-minute Quadrangle *Earthquake Zones of Required Investigation Map*.

With certain exceptions, a *project* located within an *Earthquake Fault Zone* and regulated by the *A-P Act* generally includes new *structures for human occupancy* and subdivisions of land that will eventually include *structures for human occupancy*. Structures exempted by the *A-P Act* are dependent on additional criteria such as the type of development, characteristics of the proposed or existing structure, and the value of existing structures if they are being renovated. Plate 1 is a decision flow chart intended to aid *owners/developers* and *lead agencies* in determining if a *project* is regulated by the *A-P Act*.

4.4 What does it mean when a *project* is regulated by the *A-P Act*?

Earthquake Fault Zones are regulatory zones that address the hazard of *surface fault rupture* and are just one type of regulatory zone that address earthquake-related geologic hazards. Other types of regulatory zones address the potential for liquefaction and seismically-induced landslides, which are regulated by the Seismic Hazards Mapping Act. Collectively, these hazard zones are referred to as "Earthquake Zones of Required Investigation." Within Earthquake Zones of Required Investigation, geologic investigations are required prior to the construction of buildings or, prior to the subdivision of land for certain types of developments referred to in this document as "*projects.*" If a site-specific *fault investigation* finds a geologic hazard exists, appropriate mitigation measures must be proposed in the report prior to project approval by the *lead agency*.

The *A-P Act* addresses the hazard of *surface fault rupture* and, because the *A-P Act* explicitly prohibits the construction of *structures for human occupancy* across traces of *Holocene-active faults*, the only mitigation the *A-P Act* allows for is avoidance. This means that if a *Holocene-active fault* is found during a *fault investigation*, a *structure for human occupancy* will not be allowed to be built across that fault.

4.5 Steps that the *owner/developer* should take if their *project* is regulated by the *A-P Act*.

If a proposed *project* is regulated by the *A-P Act*, the *owner/developer* should discuss with the *lead agency* the scope of the *project* and identify what will be required by the *lead agency* to meet the requirements of the *A-P Act*. Additionally, *lead agencies* are able to enact regulations that are more restrictive than the minimum standard of the *A-P Act*. For example, *lead agencies* may establish their own regulatory hazard zones, as well as have additional regulations that include structures that are exempted by the *A-P Act*. It is always best to check with the local *lead agency* to determine what additional local requirements may exist.

The *owner/developer* will also need to retain, at his or her expense, the services of a *professional geologist*. A *professional geologist* who is the agent of the *owner/developer* is known as the *project geologist*. The *project geologist* is responsible for conducting the *fault investigation*, preparing the *fault investigation report*, as well as interacting with the *lead agency*'s *reviewing geologist* during the review of the *fault investigation report*. Early in the process, the *project geologist* will also work with the *owner/developer*, as well as the *lead agency*, to develop the scope of the *fault investigation* for the *project*. Finally, based on the results of the *fault investigation*, the *project geologist* will designate areas where structures can be located, as well as recommending *setbacks* from faults with the potential for *surface fault rupture*.

The *owner/developer* should be aware that in addition to bearing the cost of the *fault investigation*, the *owner/developer* may also be responsible for costs incurred by the *lead agency* for administering the *A-P Act* for individual *projects*, which can include expenses related to the review of the *fault investigation report*. Because the *fault investigation report* will be reviewed by the *lead agency*, it is recommended that the *project geologist* consult with the *reviewing geologist* regarding the scope of the *project* before the *fault investigation* begins, as well as during the *fault investigation*. Review of field exposures by the *reviewing geologist*, in conjunction with the *project geologist*, can aid the review of the *fault investigation report* by allowing the *reviewing geologist* to be more familiar with the *project* and identifying potential areas of disagreement prior to the review of the final *fault investigation report*. A collaborative approach between the *project geologist* and *reviewing geologist* can save the *owner/developer* time and money by minimizing multiple iterations of review comments and responses. Finally, the *owner/developer* should consider allowing the *project geologist* to invite geologists from the California Geological Survey to attend field reviews. While CGS does not play a role in the review of a *project* by a *lead agency*, site visits can help improve and inform updates to existing *Earthquake Fault Zone Maps* if important data regarding fault locations and activity are found at a site.

4.6 Real estate disclosure requirements

The *A-P Act* requires that all real estate parcel transactions within an *Earthquake Fault Zone* be disclosed by the seller to prospective buyers before the sales process is

complete (California Public Resources Code (CPRC) Division 2, Chapter 7.5, Section 2621.9). The real estate agent representing the property owner is legally bound to present this information to the buyer. When no realtor is involved in a transaction, the seller must inform the buyer directly. This is usually done at the time an offer is made or accepted. As part of the Natural Hazards Disclosure Act, this information is presented in a "Natural Hazard Disclosure Statement," which also includes other types of State-mapped and local hazard zones.

SECTION 5: GUIDELINES FOR GEOSCIENCE PRACTITIONERS (PROJECT AND REVIEWING GEOLOGISTS): EVALUATING THE HAZARD OF SURFACE FAULT RUPTURE

Note: Terms in *italics* are defined in Section 1, Definitions and Acronyms

5.1 Section Outline

5.2 Introduction.
5.3 Items to Consider in the *Fault Investigation* Study.
5.4 Site-Specific Fault Investigations.
5.5 Geochronology (Age-Dating) Methods.
5.6 Contents of *Fault Investigation Reports*.
5.7 References.

5.2 Introduction

The purpose of this section is to provide guidance to *project geologists*, *reviewing geologists*, and *lead agencies* that have approval authority over *projects* based on *fault investigations* and *fault investigation reports*.

For the purposes of the *A-P Act*, an active fault is defined as one which has "had surface displacement within Holocene time" (the last 11,700 years). This definition does not mean that faults lacking evidence for surface displacement within Holocene time are necessarily inactive. A fault may only be presumed to be inactive based on satisfactory geologic evidence; however, the evidence necessary to prove inactivity sometimes is difficult to obtain and locally may not exist. By virtue that fault investigations are required by the *A-P Act* to assess the recency of fault movement implies that faults within an EFZ are presumed to be active until determined otherwise.

Terms such as "potentially active" and "inactive" have been commonly used in the past to describe faults that do not meet the SMGB definition of "active fault." However, these terms have the potential to cause confusion from a regulatory perspective, as they are not defined in the *A-P Act*, and may have other non-regulatory meanings in the scientific literature or in other regulatory environments. In order to avoid these issues, introduced below are terms that provide added precision when used in classifying faults regulated by the *A-P Act.* Faults are classified into three categories on the basis of the absolute age of their most recent movement and are shown on Figure 5.1 on a hypothetical trench log:

1) *Holocene-active faults*: Faults that have moved during the past 11,700 years. This age boundary is an absolute age (number of years before present) and is not a radiocarbon (^{14}C) age determination, which requires calibration in order to derive an absolute age.

2) *Pre-Holocene faults*: Faults that have not moved in the past 11,700 years, thus do not meet the criteria of "*Holocene-active fault*" as defined in the *A-P Act* and SMGB regulations. This class of fault may be still capable of surface rupture, but is not regulated under the *A-P Act*. Depending on available site-specific and regional data such as proximity to other active faults, average recurrence, variability in recurrence, the timing of the most recent surface rupturing earthquake, and case studies from other surface rupturing earthquakes, the *project geologist* may, but is not required to, recommend *setbacks*. Engineered solutions can also be considered by a licensed engineer operating within his or her field of practice.

3) *Age-undetermined faults*: Faults where the recency of fault movement has not been determined. Faults can be "age-undetermined" if the fault in question has simply not been studied in order to determine its recency of movement. Faults can also be age-undetermined due to limitations in the ability to constrain the timing of the recency of faulting. Examples of such faults are instances where datable materials are not present in the geologic record, or where evidence of recency of movement does not exist due to stripping (either by natural or anthropogenic processes) of Holocene-age deposits. Within the framework of the *A-P Act*, *age-undetermined faults* within regulatory *Earthquake Fault Zones* are considered Holocene-active until proved otherwise.

It is worth reiterating that a *project* located outside of an *Earthquake Fault Zone* is still regulated by the *A-P Act* if a *Holocene-active fault* is found at that site. This can happen if a *lead agency* has established its own regulatory zone requiring an assessment of *surface fault rupture* hazard or in a situation where a *Holocene-active fault* is discovered during a geologic investigation for that *project*. If located outside of an *Earthquake Fault Zone*, *age-undetermined faults* are not regulated by the *A-P Act*. However, the *project geologist* may want to consider all available data and provide recommendations regarding whether *setbacks* or other engineered solutions should be considered in the placement or design of a structure crossing these faults.

5.3 Items to Consider in the Site Investigation Study

The following concepts are provided to help focus the *fault investigation*:

1. The fact that a *project* lies within a designated *Earthquake Fault Zone* does not necessarily indicate that a hazard requiring *mitigation* is present at that site. Instead, it indicates that regional (that is, not site-specific) information suggests that the probability of a hazard is great enough to warrant a site-specific investigation. However, the working premise for the planning and execution of a site investigation within an *Earthquake Fault Zone* (EFZ) is that ***the suitability of the site must be demonstrated***. This premise will persist until either: (a) the *fault investigation* satisfactorily demonstrates the absence of *surface fault rupture* hazard, or (b) the site investigation satisfactorily defines the *surface fault rupture* hazard and provides a suitable *setback* recommendation for its *mitigation*.

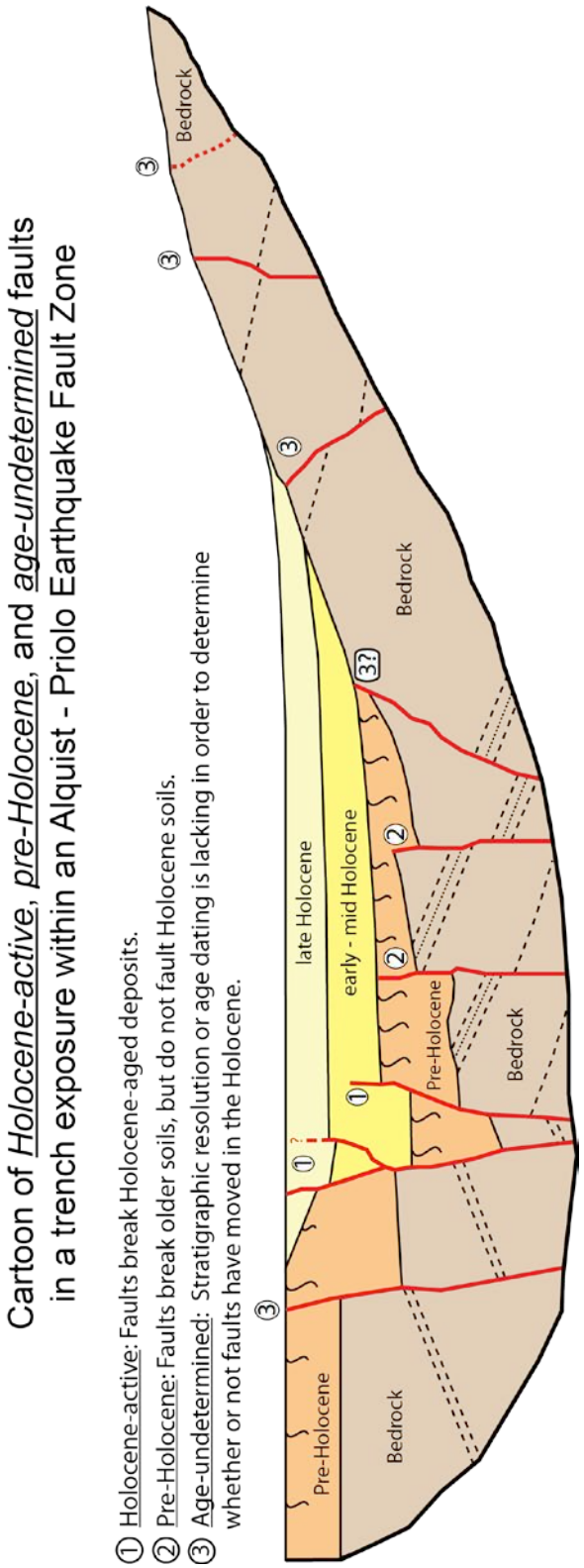

Figure 5-1. Fault classifications in a hypothetical trench log where *Holocene-active faults* break Holocene-age deposits and *pre-Holocene faults* break pre-Holocene age deposits, but not Holocene age deposits. The recency of movement for *age-undetermined faults* are unconstrained due to a lack of overlying deposits to determine the timing of the most recent fault displacement.

2. The fact that a *project* lies outside a mapped *EFZ* does not necessarily mean that the site is free from seismic or other geologic hazards, nor does it preclude *lead agencies* from adopting regulations or procedures that require site-specific fault and/or geologic investigations and mitigation of seismic or other geologic hazards. It is not always possible for CGS geologists mapping at a regional scale to identify all *Holocene-active faults*; not all faults, including *Holocene-active faults,* meet the criteria of well-defined. Furthermore, in California there have been examples of *faults* that were understood to be *pre-Holocene* that have ruptured in historical time. These instances of faulting underscore the importance of considering the *surface fault rupture* hazard to *projects*, even when they are not regulated by the *A-P Act*. It is the responsibility of the *project geologist* to inform his or her client and the *lead agency* of the presence of a *Holocene-active fault* on a site and it is the responsibility of the *lead agency* to prohibit *structures for human occupancy* across the trace of *Holocene-active faults*, whether that fault is found inside or outside of an *EFZ*.

3. *Lead agencies* have the right to approve, and the obligation to reject, a proposed *project* based on the findings contained in the *fault investigation report* and the *lead agency's* technical review. The task of the *owner/developer's project geologist* is to demonstrate, to the satisfaction of the *lead agency,* which is advised by the *lead agency*'s *reviewing geologist*, that:

   - The site-specific *fault investigation* is sufficiently thorough;
   - The findings regarding *surface fault rupture* hazards are valid and persuasive; and,
   - Any proposed *setbacks* are sufficient to account for both *Holocene-active fault traces* and *fault-related ground deformation*.

5.4 Site-Specific *Fault Investigations*

The primary purpose of a site-specific *fault investigation* is to determine the presence or absence of existing faults and evaluate the recency of their past activity, which can be a deceptively difficult geologic task. Most faults are complex, consisting of multiple breaks and can exhibit both brittle and plastic (e.g. folding) deformation. The evidence for identifying *Holocene-active fault* traces sometimes is subtle or obscure and the evidence necessary to conclude the lack of Holocene activity may be difficult to obtain and locally may not exist. A basic assumption in this discussion is that a *fault investigation* is being conducted because of the presence of an *A-P Earthquake Fault Zone* (EFZ), a *lead agency's* requirement for it based on local information, or some other regional evidence of *Holocene-active faulting* on or near the site. A *project geologist* ideally will have a high level of experience in conducting *fault investigations* and will be familiar with and employ the current state-of-the-practice techniques. Because the existing literature on conducting fault investigations is quite robust (e.g. see, Lund and others, 2016, and McCalpin, 2009), these guidelines will only briefly cover the topic.

Whenever a *fault investigation* is initiated, the *project geologist* should contact the *lead agency* and its *reviewing geologist*. The purpose for this initial contact is three-fold:

1. The *lead agency* may have records of previous *fault investigations* on or in the vicinity of the *project* site that can be useful to the site investigation and the *fault investigation report*.

2. The *lead agency or reviewing geologist* can inform the *project geologist* of local ordinances, such as differences in exemptions to *projects* than what are specified in the *A-P Act*, or specified *setbacks* from *Holocene-active faults*.

3. The *reviewing geologist* can inform the *project geologist* about local investigations, reporting requirements, and expectations. The *project geologist* can inform the *reviewing geologist* what investigation methods are to be used and when those methods will be conducted, and both parties can discuss how to handle possible complications that can arise from investigation results, such as how the *lead agency* will want to handle *age-undetermined faults* or *fault-related ground deformation*.

It is highly recommended that the *project geologist* consult with the *reviewing geologist* regarding the scope of the *project* before the *fault investigation* begins, as well as during the *fault investigation*. Review of field exposures by the *reviewing geologist*, in conjunction with the *project geologist*, can aid the review of the *fault investigation report* by allowing the *reviewing geologist* to be more familiar with the *project* and identifying potential areas of disagreement prior to review of the *fault investigation report*. A collaborative approach between the *project geologist* and *reviewing geologist* can save the *owner/developer* time and money by minimizing multiple iterations of review comments and responses. Finally, the *owner/developer* should consider allowing the *project geologist* to invite geologists from the California Geological Survey to attend field reviews. While CGS does not play a role in the review of a *project* by a *lead agency*, site visits can help improve and inform updates to existing *Earthquake Fault Zone maps* if important data regarding fault locations and activity exist at a site.

Surficial Investigations

Surficial geologic and geomorphic mapping should be conducted early in the investigation and include an area surrounding the immediate vicinity of the *project* site. The purpose of the surficial mapping is to identify fault-related geomorphic features and should begin with a compilation of existing literature on the local geology and any previous fault-related studies in the area. In particular, previous *fault investigation reports* on the current and nearby sites should be sought out and the results incorporated. CGS maintains an online database of *fault investigations* that *lead agencies* submit as part of the *A-P Act*:

https://spatialservices.conservation.ca.gov/arcgis/rest/services/CGS/

Observations, measurements and mapping ideally employ the use of both remotely sensed imagery and field-based work. This work can provide a sense of past fault

movement and is critical for locating fault trenches and other subsurface investigations in order to yield the most beneficial results.

The traditional remote sensing technique for *fault investigations* has been the use of stereo-paired aerial photography. Ideally, multiple sets of variable vintage photographs, including pre-development photos, are used to interpret fault-related geomorphic features, vegetation and soil contrasts, lineaments, and other features of possible fault origin. Lidar-based (Light Detection and Ranging) imagery (e.g. hillshade and slopeshade maps, topographic profiles) processed from high-resolution elevation measurements has become an important tool for geomorphic interpretation. Most *EFZ*s have had lidar flown as part of the B4 Project at OpenTopography (http://www.opentopography.org/) and other important lidar elevation datasets for California are also available through this organization. In addition, a number of counties have had lidar elevation data flown and have made them available (e.g. Los Angeles County - https://egis3.lacounty.gov/dataportal/tag/lidar/). The USGS also hosts some lidar datasets for California (https://nationalmap.gov/3DEP/). Another recent technique that has been employed in geomorphic interpretation is photogrammetric-based "structure-from-motion" (Westoby and others, 2012). This method uses multiple, overlapping photographs to create 3-dimensional models of the ground surface that, when coupled with high-precision ground control, can provide accurate, high resolution imagery for fault investigations.

Field-based surficial observations include mapping the distribution of geologic and soil units, geomorphic features indicative of possible faulting, springs, deformation of engineered structures due to fault creep, and any other features or anomalies identified with remote sensing techniques.

Subsurface Investigations

Subsurface *fault investigations* are primarily conducted through the use of fault trenches to expose *fault traces* and their effects on shallow stratigraphic units. However, other methodologies are often used, either in conjunction with trenching or as substitutes where trenching is not feasible. In some cases, it will be necessary to extend some of the investigative methods well beyond the site or property being investigated. These can be broken into two broad categories: 1) physically drilling and sampling subsurface geologic materials, and 2) using geophysical techniques to measure subsurface material properties. The subsurface methods are discussed in more detail below.

Trenching

Trenching is the most common type of subsurface fault investigation and offers several advantages over other methods including direct observation of subsurface geologic relationships and the ability to easily sample geologic materials for chronologic dating (Taylor and Cluff, 1973; Hatheway and Leighton, 1979; McCalpin, 2009b). Trenches excavated for the purpose of determining recency of fault activity should be excavated as orthogonal to the trend of a mapped fault as feasible because faulting relations become increasingly difficult to identify and measure if the exposure is oblique to the local trend of faults. Siting trench locations should also consider possible projections

of nearby mapped faults and possible unmapped splay faults, to ensure that areas within, and close to, the building footprint are not affected by *Holocene-active faults*.

Trench walls should be cleaned to expose key stratigraphic and structural relations including marker horizons and faults. While cleaning of trench walls can be labor and time intensive, fault-related features can be subtle and often require careful and repeated scraping in order to create an exposure that can be interpreted with confidence. Techniques to clean trench exposures typically include scraping, picking, and brushing. In general, faults, especially those with minor apparent displacements, are most readily identifiable when the trench wall is scraped as smooth as possible. In some investigations, pressure washing with water or using a leaf blower has been successful in etching mappable layers with subtle differences in grain size. The *project geologist* should consider and employ the cleaning technique that will best create an interpretable exposure.

Stratigraphic and structural relations should be logged at a scale appropriate to record the characteristics that demonstrate the presence or absence of faulting. The *project geologist* should consider whether or not the stratigraphic relations are adequate to resolve whether faulting can be confidently identified within the exposed section. Observations regarding continuity of key units, ability to identify key marker horizons and degree of bioturbation that may obscure faulting relations should be recorded on the logs. Care should be taken to document even minor faulting: Faults with small apparent offsets, especially vertical offsets along dominantly strike slip faults, can have significant true net displacements.

Photographic documentation of trench exposures is now a common practice and offers the advantage of the visual documentation of trench exposures that provides additional objective documentation of geologic relationships in a subsurface exposure. Photographs of key geologic relationships provide supporting documentation that aids in the review of the *fault investigation report*. Furthermore, with the advent of modern easy to use, affordable structure-from-motion (e.g. softcopy photogrammetry) software, ortho-rectified photo-mosaiced trench logs can be quickly produced. These type of trench logs offer the advantage of giving the *project geologist* a synoptic view of the structural and stratigraphic relations, which may not be readily apparent in a narrow slot trench.

Where the ability to preclude Holocene faulting through trenching is limited by high groundwater or thick Holocene deposits, borings can be used to supplement trenching. However, in many cases, trenching to the maximum feasible depth will still be valuable in order to make direct observations regarding the character of subsurface deposits. It also provides the opportunity to collect samples for dating to constrain the age of shallow materials and develop a comprehensive chronologic model.

Drilling and Sampling

Large-diameter borings, which can be accessed and logged by a geologist, can provide a detailed picture of subsurface stratigraphy and opportunities for the selection of age-datable samples. Small-diameter borings that capture continuous core also can

provide stratigraphy and material for age dating. The cone penetrometer test (CPT) measures a deposit's resistance to penetration, or tip resistance, and the granular nature of soils, or sleeve friction, as it is pushed into the ground (Grant and others, 1997; Edelman and others, 1996). Generally, the CPT is not used to collect soil samples but the continuous measurement of "soil behavior" provides a reliable stratigraphic section. Because of the relatively low cost of the CPT, this tool is frequently used in urban environments where trenching and other drilling methods are difficult. However, CPT is best done in conjunction with one or more continuously logged borings to correlate CPT results with on-site materials. As with boring transects, CPT borings should be appropriately spaced in order to address the type of faulting that is anticipated. For example, strike-slip faults may require borings that are more closely spaced than other types of faulting (normal faulting, reverse faulting). Some *lead agencies* may specify minimum requirements for the spacing of borings along transects for *fault investigations*. The *project geologist* should check with the *lead agency* for any requirements when planning a *fault investigation* for a *project*.

All three of these boring methods can be used to measure ground water levels useful for identifying fault-related ground water barriers, but large-diameter borings are often susceptible to collapse and typically cannot safely be downhole logged below the water table. Without the continuous exposure provided by a trench, direct observation of a fault in any of these drilling methods may not be possible, and the reliable identification of faulting is more uncertain. The strength of these methods lies in creating a stratigraphic cross-section across a faulted area with a line of closely spaced borings and/or CPT soundings that provides evidence of faulting through vertical separation of stratigraphic units. Because the spacing required to prepare an adequate cross-section depends on the stratigraphy, type of faulting, ground water conditions, and presence of local infrastructure, it is recommended that the *project geologist* consult with the *reviewing geologist* to see if the *lead agency* has requirements for this type of investigation and to assist in the development of an appropriate exploration plan. Caution should be exercised when employing these methods on strike-slip faults, as two-dimensional cross-sections may not provide adequate resolution if a fault has little-to-no vertical separation. Both the *project geologist* and the *reviewing geologist* should also be aware that geologic cross-sections are often non-unique interpretations of data, and that multiple working hypotheses should be considered when working with these types of subsurface data. For example, distinguishing channel margins from faulting without the advantage of direct observation can be challenging and may require deeper or additional more closely spaced borings. It is the responsibility of the *project geologist* to provide both the interpretation of the feature in question and the data that supports the interpretation, as well as an explicit discussion regarding the uncertainties in interpretation.

Geophysical Techniques

Geophysical methods provide a non-invasive way to measure certain properties of subsurface deposits that can help locate fault traces. Chase and Chapman (1976), Stephenson and others (1995), Cai and others (1996), and McCalpin (2009) provide examples of the use of seismic reflection, seismic refraction, magnetic, gravity, electrical resistivity, and ground penetrating radar methods in fault studies. Because geophysical

methods alone can only provide a range of alternative interpretation for what exists in the subsurface, they should be used to guide and/or augment geologic data derived from mapping, trenching, and drilling in fault investigations (Chase and Chapman, 1976). While geophysical methods have value in locating potential faults and connections between mapped faults, they rarely provide information on the recency of activity unless accompanied by a subsurface investigation method that retrieves samples for dating.

5.5 Geochronology (Age-Dating) Methods

Estimating the age of fault activity relies on dating geologic units that predate and postdate faulting (Pierce, 1986; Birkeland and others, 1991; Rutter and Catto, 1995; McCalpin, 2009a). Site-specific *fault investigations* expose the fault zone at the *project* site to determine which *fault traces* are *active. However, t*he evaluation of a *fault* may not be limited to information derived solely from a *project* site, especially if higher-quality relevant information exists elsewhere. It is common that structural relationships pertaining to *fault* rupture timing exist onsite while quantitative chronologic data may be better defined offsite, or the opposite situation may exist. When there is a potential to acquire quantitative chronological data at the site of interest, it should be obtained. All chronological data pertaining to the project from on- and offsite sources should be considered and reported in the investigation, and a comprehensive case for the chronology of faulting specific to the project should be the presented.

There are many Quaternary age-dating methods that can be applied to characterizing fault activity (Noller and others, 2000; Lettis and Kelson, 2000; Preusser et al, 2008; McCalpin, 2009) but only a subset of these are applicable to deposits in the late Pleistocene to present age range (roughly the last 130,000 years). Table 5-1 provides a list of the most commonly used methods, their age and uncertainty ranges, the property measured and sample material, and criteria for choosing a methodology. Because accuracy and precision are valued criteria in fault investigations, quantitative (chronometric) dating methods are preferred if samples for dating can be obtained. Radiocarbon (^{14}C) dating is the most widely used dating method and the *project geologist* should use it when possible or justify why it was not used. Radiocarbon dating has proven to be very reliable and cost effective, and is the most widely understood and applied method for active fault characterization. Relative dating methods, such as soil profile development index, are prone to subjectivity and significantly greater uncertainty. Ideally, relative dating methods are used to complement quantitative dating methods, or when they are the only methods that can be utilized. Often the relative methods provide chronology guidance during the initial phase of fault investigations. Other methods that have been used in *fault investigations* but will not be covered in these guidelines include: landform development, stratigraphic correlation of rocks/minerals/fossils, archeological artifacts, historical records, tephrochronology, fault scarp modeling, paleomagnetism, dendrochronology, and rock and mineral weathering.

Geochronology Uncertainty

The *project geologist* should understand the uncertainty associated with any age determination in the evaluation of fault activity. All sources of uncertainty should be

considered and addressed in the *fault investigation report*. The three primary sources of uncertainty in age determinations are:

Context Uncertainty

Context uncertainty generally represents the largest uncertainty in dating fault activity, and consists of the generally poorly known relationship of the chronologic measurement of an individual sample to the faulting event of interest. For example, a ^{14}C date derived from a detrital charcoal sample may have a considerable inherited age because it was either reworked from an older sedimentary unit or because it was derived from older wood that does not represent the deposit age, such as the core of a long-lived tree. For all quantitative dating methods, the context uncertainty can be thought of as the unknown age difference between the event of interest and the dated samples.

Laboratory Uncertainty

There are inherent laboratory uncertainties associated with each quantitative dating method that need to be considered in any chronological assessment. These uncertainties are difficult to reduce, although, dating of additional samples can improve accuracy and confidence.

Chronologic Modeling Uncertainty

All chronological data must be interpreted to assess the age of faulting. In general, this requires some extrapolation or interpolation, or bracketing of the event of interest. How the data are related to the event of interest is a "chronologic model." The type of model used will influence the chronological result. For example, when evaluating a scatter of different sample ages from one geologic unit, a decision must be made as to how to use the results. One may have sample ages from two different sample types, or different dating methods, or there may be stratigraphically inconsistent results. A careful consideration of each chronological constraint must go into the development of the chronologic model.

Common Dating Methods for Determining Fault Activity

Radiocarbon Dating (^{14}C)

Radiocarbon dating is by far the most common age-dating method applied to *fault investigations* because it is accurate within an age-range extending to 50,000 years before present, and datable samples are generally available. With fast laboratory turn-around times possible (days to about a week), it is often feasible to get results while the field work is ongoing and thus provide valuable guidance for completing the investigation. Radiocarbon dating consists of an isotopic method based on measuring the ratio of unstable ^{14}C isotope to stable ^{12}C in organic compounds (Taylor and others, 1992). The method is based on the fact that all living organisms exchange carbon with the surrounding environment, a small fraction of which is the unstable isotope ^{14}C as opposed to the stable ^{12}C isotope (Trumbore, 2000). When an organism dies, the exchange of fixed carbon between the organism and the environment stops and the amount of ^{14}C starts decreasing at a known rate due to radioactive decay. This ^{14}C decay provides a clock that is used to calculate a quantitative age.

Table 5-1. Most Applicable Age Dating Methods for Fault Activity Investigations.

Method	Age Range / Uncertainty Range	Property Measured / Sample Materials	Application Criteria
Radiocarbon Dating	0 to 50,000 years 2 to 5%	^{14}C Organic matter	Most favored method due to its proven reliability to provide objective results. • multiple sample analyses allow an increase in confidence and accuracy • fast turn around • single dates can be misleading due to the difficulty in evaluating the context uncertainty
Luminescence	100 to 100,000 years Greater than 10%	Luminescence Quartz or Feldspar Crystals	Often suitable where sand-size material exists and when little C-14 dateable material can be found. Often requires research level effort to properly integrate all aspects of the method. Can provide reliable age estimate if done correctly. • strict sampling protocol • may complement ^{14}C well, as it can help assess context uncertainty
Cosmogenic nuclide	1,000 to 2,000,000 years Greater than 10%	^{10}Be, ^{26}Al, ^{36}Cl Quartz Feldspars Carbonates	Unique for its ability to date surfaces or burial events. Often requires research level effort to properly integrate all aspects of the method. Can provide reliable age estimate if done correctly. • strongly influenced by sampling protocol • accurate results are model dependent
Soil Profile Development Index (SDI)	500 to 500,000 Greater than 30%	Numerous Alteration of parent material	Requires quantitative dating of similar soil profiles in the area as calibration. Significant expertise is required for SDI age estimates.

In the case of plant material, where the original amount of ^{14}C in the atmosphere has varied through time, an additional calibration with known age samples from tree rings provides an accurate calendar age correction called “dendrocalibration” (Stuiver and others, 1993). Radiocarbon dating can be more challenging with other types of samples; aquatic-based (marine or fresh water) organisms, such as invertebrate shells, can obtain carbon from water with a significant “reservoir effect,” resulting in a lag time (biasing the sample to be older than its true age by several hundred years or more) that requires a correction factor. In this case, the resulting ages may be too old and are termed “apparent

ages." These apparent ages can be calibrated but are associated with additional uncertainties.

Currently, two laboratory methods are used in radiocarbon dating (Trumbore, 2000): decay counting, and the more recent Accelerator Mass Spectrometry (AMS) measurement. The main difference of concern to the practitioner is that AMS methods can be more readily used because the sample size requirement is orders of magnitude less: 0.2 to 2 milligrams with AMS versus 3 grams with decay counting of carbon remaining after pretreatment. Because normal pretreatment procedures remove 25% to 80% of the original sample material, a sample larger than 3 grams is required for the decay counting method, which can be difficult to obtain. The most common sample type used for ^{14}C dating is detrital charcoal, which is most commonly found in sand to clay-sized sediments.

^{14}C Sample Contamination

Sample contamination is a process that can shift ^{14}C age-dating results. However, the phenomenon is widely misunderstood and in some investigations has erroneously been used to justify the rejection of otherwise valid results or to justify not using ^{14}C dating at all. The process of sample contamination consists of adding material of a different age to the carbonaceous sample after deposition. In general, as carbonaceous material in the ground gets older, samples become increasingly susceptible to "rejuvenation contamination," due mostly to younger plant roots penetrating the older deposited material. In almost all cases, contaminant material can be visually detected with a microscope and all samples are physically and chemically pretreated to remove contaminant compounds. These pretreatment procedures are very effective and provide reliable results. Sample contamination in which laboratory results of younger material return older dates is relatively rare.

A common misconception is that ground water contamination of detrital charcoal is a contributes to radiocarbon ages that do not represent the true age of the sample. In reality, nearly all detrital charcoal experiences some degree of wetting from ground water and standard laboratory pretreatments have been proven to be highly effective in removing contamination from this source. Research by Pigati and others (2007) has shown that contamination can significantly affect samples that are already very old, while the impact of contamination for samples less than 20 ka old, which includes the time frame of interest for most *A-P Act* triggered fault investigations, is negligible.

It is useful to examine samples with a microscope in order to assess their composition prior to submitting to a laboratory for dating and communicate to the laboratory the objective of what event one is trying to date, which may influence the laboratory procedures. For example, samples often contain multiple carbon fractions that can be of different ages. If one does not know with certainty what carbon fraction to measure, they can instruct the laboratory to preserve various extracted carbon fractions for potential dating after initial results are evaluated.

One type of contamination from which samples and laboratories cannot recover is the introduction of artificial ^{14}C into a sample. Artificial ^{14}C is used in biological research

as a tracer. The concentration of artificial ^{14}C can be 100,000 times more than bio-based materials and the laboratory detection methods are simply overwhelmed by the abundance. Because the ^{14}C tracer is not visible it is very difficult to avoid and easily spread unintentionally. The only remedy is complete avoidance of any sources, or facilities where ^{14}C tracers have been used (Zermeno and others, 2004). Some laboratories will request information regarding sample storage prior to submission in order to screen samples that may have been exposed to ^{14}C tracer, as this type of contamination can be detrimental to a dating laboratory's operations.

Radiocarbon Sample Collection

The following sample collection procedures, or "best practices", will facilitate obtaining accurate chronologic age control of faulting:

- Collect multiple samples from layers of interest.
- Collect more samples than anticipated for laboratory testing. This practice provides a back-up if laboratory results or development of the chronologic model could benefit from additional laboratory determinations after trenches are backfilled.
- Individual samples are preferable to bulk or combined samples. Bulk or combined samples result in average ages with increased context uncertainties.
- Bulk samples of organic-bearing sediments should be collected, especially when individual organic samples are not discernable in the field. Bulk samples can be sieved and microscopically inspected to find individual samples. As such, bulk samples also provide a backup to individual samples. However, dating bulk samples may introduce larger contextual uncertainties due to the mixing of organic materials that may have different ages.
- Minimize the context uncertainty by collecting organic material formed in place (*in situ*). These sample materials, such as peat, are preferable to samples that are often associated with significant context uncertainty such as detrital charcoal.
- Sample storage and transport must avoid contaminating samples. Contact with artificial ^{14}C will render samples useless and cause expensive damage to laboratory facilities. If there is any question about the integrity of the samples, communication with the dating laboratory is essential.

Considerations in Evaluating Radiocarbon Results

A large body of published research related to dating of samples and development of chronologic models applied to paleoseismic studies exists in the literature (e.g. Scharer et al, 2011). Listed below are several guidelines a *project geologist* and *reviewing geologist* should keep in mind when evaluating results obtained from radiocarbon dating:

- Several dates may be required to identify a representative depositional age of a stratigraphic layer.
- Several individual detrital charcoal samples from a single layer may result in a spread of ages of several hundred years or more. This spread may

indicate that either the source of charcoal is derived from long-lived trees or that depositional reworking is significant. If bioturbation does not affect the area from which the sample was collected from, then the youngest age is the most representative of the deposit age.

- Results from bulk sample dating are usually more difficult to interpret because they generally consist of an unknown mixture of various-aged organic materials. Bulk sample ages may be significantly older than the depositional age of the layer. However, bulk sample dating results, in the absence of other quantitative dates, can be valuable as limiting ages in context with other chronological data.
- Consider the sample context, sample material, and other chronological information when assessing the age of faulting. Considerations include:

    - Are radiocarbon sample ages within individual units consistent with each other?
    - Are radiocarbon ages from successive layers in the correct stratigraphic age order?
    - Do layers that have been correlated across the site exhibit consistent ages?
    - Are different sample materials providing consistent results?
    - Which samples are outliers?
    - Is there consistency with other dating methods? If not, then what are the possible explanations for the inconsistencies?

Luminescence Dating

Luminescence techniques (Forman, 2000, Preusser and others, 2008) measure the time since mineral grains were exposed to sunlight (Optically Stimulated Luminescence - OSL; Infrared stimulated luminescence - IRSL) or heat (Thermoluminescence - TL). The luminescence signal accumulates in minerals such as feldspars and quartz, being induced by naturally occurring radioactivity from the material surrounding the sample. The radioactivity excites electrons within the minerals, which are trapped in defects within the crystal lattice. The controlling factors are the dose rate and the time since exposure. The dose rate varies at each sample site and thus requires, in order of preference, either an in-place measurement, or a sample for neutron activation measurement. Another controlling parameter is the number of crystal defects within the mineral grains which has a significant influence on the suitability of this method. The effective age range of luminescence dating methods is from hundreds of years to more than 100,000 years, depending on the number of crystal defects and the local dose rate. Considerable research-level effort is required for these methods and involving an expert will likely improve the potential for successful outcomes.

<u>Considerations in Luminescence Sample Collection</u>

Luminescence methods require a particular prescribed sampling protocol, which includes detailed information about the geological context, depositional history, environment, and hydrological conditions (moisture content). The various methods and laboratories have sampling protocols, and it is recommended that the *project geologist*

consult with an expert before samples are collected. In particular, samples need to be collected in a fashion that prevents the sediment from being exposed to light during sampling and transport to the laboratory. In addition, the dose rate must be determined at each individual sample location, either by in-place measurement or by taking a bulk sample for laboratory measurement.

Cosmogenic Nuclide Methods

Cosmogenic nuclide dating methods, mostly surface exposure applications (e.g., Ivy-Ochs and Kober, 2008, Benedetti and Van der Woerd, 2014) have been applied to characterize fault activity. These radio isotopic methods use isotopes such as ^{10}Be, ^{26}Al, or ^{36}Cl, as an accumulation clock, with a secondary decay clock based on the half-life decays of these same isotopes. Using multiple isotopes can improve the accuracy of these applications. The isotopes are measured by accelerator mass spectrometry (AMS). As with luminescence dating, considerable research-level effort is required for these methods and involving an expert will likely improve the potential for successful outcomes.

Soil Profile Development Dating

Soils result from the chemical and physical alteration of sediments and rocks at Earth's surface, and are strongly influenced by the interaction of the soil parent material with organic compounds and water. Many factors control the degree of soil development, of which time since deposition is perhaps the most significant to fault studies (Birkeland, 1984, 1990, Rockwell, 2000, Sauer and others, 2014). Soil profiles consist of horizons, which are the characteristic layers that distinguish one type of soil from another, and they form in relatively stable (non-erosional) conditions during times of non-deposition of sediments.

There are many measures of the strength of a soil profile, such as thickness and amount of alteration as measured by accumulation or depletion of chemical elements compared to the original parent material. Field description procedures have standards that should be used (*Schoeneberger, Wysocki, Benham, and Soil Survey Staff, 2012*). Regardless of whether one uses soils to arrive at an age estimate, every practitioner using trenches for investigating faults should have a basic understanding of soil formation (Birkeland, 1984. Borchardt, 2010, Rockwell, 2000) as they can inform on the general age of the sediment exposed in the trench, as well as provide mappable horizons to evaluate the presence or absence of faulting.

To obtain an age estimate for a soil, a semi-quantitative soil development index (SDI) has been developed (Harden, 1982) and refined by McFadden and Weldon (1987), McFadden (1988), Rockwell and others, (1985, 1994), and Birkeland and others (1991). However, the rate of soil-profile development must be locally calibrated by quantitative dating methods before reliable age estimates can be made. Poor application or lack of this crucial step has often downgraded the useful application of this method and made it unreliable. In practice, and in light of the availability and improvements of quantitative dating methods, soils expertise is a valuable complement to fault investigations.

Chronological Modeling

To assess the age of fault activity, the *project geologist* should develop a chronological model that considers all relevant chronological data and the relative uncertainties associated with the methods used. This can be as simple as bracketing the age of the most recent fault activity between quantitative dates but can become a complicated undertaking when several chronological inputs, including uncalibrated ^{14}C dates, are considered. To the extent possible, the *project geologist* should have a working chronological model before the trench is closed so that it can be presented to the *reviewing geologist* and discussed in the field.

Chronological modeling software such as Oxcal (Bronk Ramsey, 1994) provides an efficient web-based tool that provides a controlled method to incorporate multiple types of chronological data. A primer for paleoseismic applications using Oxcal is provided by Lienkaemper and Bronk Ramsey (2009). Another, ^{14}C-specific, online calibration tool is CALIB (Stuiver and others, 2017).

5.6 Contents of *Fault Investigation Reports*

The following topics should be considered and addressed in detail where essential to support opinions, conclusions, and recommendations, in any *fault investigation*. It is not expected that all of the topics or investigative methods outlined below will be necessary in a single investigation.

I. Text.
- A. Purpose and scope of investigation; description of proposed development.
- B. Geologic and tectonic setting, including seismicity and historical accounts of earthquakes.
- C. Site description and conditions, including dates of site visits and observations. Include information on geologic units, graded and filled areas, vegetation, existing structures, and other factors that may affect the choice of investigative methods and the interpretation of data.
- D. Methods of investigation.
  1. Review of published and unpublished literature, maps, and records concerning geologic units, faults, ground-water barriers, and other factors.
  2. Surficial investigations
     - a. Geomorphic interpretation: description of methods used and findings.
     - b. Field-based observations: description of methods used and findings.
  3. Subsurface investigations.
     - a. Trenching and other exposures providing detailed and direct observation of continuously exposed geologic units, soils, faults, and geologic structures.
     - b. Borings and cone penetrometer testing (CPT) providing measurements and physical samples of geologic units and

ground water at specific locations. The number and spacing of borings and CPT soundings should be sufficient to adequately image site stratigraphy.

c. Geophysical investigations: description of equipment and techniques used, data processing methods, and findings; supporting data should be presented.

4. Fault Activity and Chronology: description of methods used and findings. If radiometric dating (especially 14C) is not used, the report should state reasons why.
5. Other methods should be discussed when special conditions permit or requirements for critical structures demand a more intensive investigation, such as aerial reconnaissance overflights, and microseismicity monitoring.

E. Conclusions.
1. Location and existence (or absence) of all faults on or adjacent to the site; ages of past rupture events where determined or estimated.
2. Type of faults and nature of anticipated offset including sense and magnitude of displacement, if possible.
3. Distribution of primary and secondary faulting (fault zone width) and *fault-related ground deformation*.
4. Probability of, or relative potential for, future surface displacement. The likelihood of future ground rupture seldom can be stated quantitatively, but may be stated in semi-quantitative terms such as low, moderate, or high, or in terms of slip rates determined for specific fault segments.
5. Degree of confidence in and limitations of data and conclusions, including a discussion regarding stratigraphic resolution and ability to confidently identify faulting within the exposed stratigraphic section.

F. Recommendations.
1. Setback distances of proposed structures from *Holocene-active* or *age-undetermined faults*. The setback distance generally will depend on the quality of data, type and complexity of fault(s), and extent and severity of *fault-related ground deformation* encountered at the site. Lead agency regulations may dictate minimum distances (e.g., see Appendix D).
2. Additional measures (e.g., strengthened foundations, ground improvement, flexible utility connections) to accommodate warping and distributed deformation associated with faulting.
3. Limitations of the investigation; need for additional studies.

II. References.
A. Literature and records cited or reviewed; citations should be complete.
B. Aerial photographs, lidar data or other imagery used in geologic and geomorphic interpretations - list type, date, scale, source, and index numbers.
C. Other sources of information, including well records, personal communications, and other data sources.

III. Illustrations -- these are essential to the understanding of the report and to reduce the length of text.
   A. Regional location maps - identify site locality, significant faults, geographic features, regional geology, seismic epicenters, and other pertinent data; 1:24,000 scale is recommended. If the site investigation is done in compliance with the Alquist-Priolo Act, show site location on the appropriate Official Map of Earthquake Fault Zones.
   B. Site development map - show site boundaries, existing and proposed structures, graded areas, streets, exploratory trenches, borings, geophysical traverses, locations of faults, and other data; recommended scale is 1:2,400 (1 inch equals 200 feet), or larger.
   C. Site geologic and geomorphic maps - show distribution of geologic and/or soil units, faults and other structures, geomorphic features, aerial photographic lineaments, and springs; on topographic map 1:24,000 scale or larger; can be combined with III(A) or III(B).
   D. Geologic cross-sections, if needed, to provide 3-dimensional picture.
   E. Logs of exploratory trenches and borings – show details of observed features and conditions; should not be generalized or diagrammatic. Logs should be drawn on mosaicked and rectified color photographs whenever possible. Trench logs should show topographic profile and geologic structure at a 1:1 horizontal to vertical scale; scale should be 1:60 (1 inch = 5 feet) or larger.
   F. Geophysical data and geologic interpretations.

IV. Appendices: Supporting data not included above (e.g., water well data, photographs, aerial photographs, lab reports).

V. Authentication: Geologic reports require both the *Project geologist's* signature and must be stamped with his or her seal, per the Geologist and Geophysicist Act (Business and Professions Code section 7800-7887).

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SECTION 6: GUIDELINES FOR GEOSCIENCE PRACTITIONERS (REVIEWING AND PROJECT GEOLOGISTS): REVIEWING SITE-INVESTIGATION REPORTS

Note: Terms in *italics* are terms defined in Section 1, Definitions and Acronyms

6.1 Section Outline

6.2 Objectives of this section.
6.3 The Reviewer.
6.4 Geologic Review.
6.5 References.

6.2 Objectives of this section

The purpose of this section is to provide general guidance to *lead agencies* that have approval authority over *projects* and for those geologists (*reviewing geologists*) who review *fault investigation reports* on behalf of those agencies. *Project geologists* will also find this section useful as a guide to the expectations of the *lead agency* review process. These general guidelines are modified from an article titled, "Geologic Review Process" by Hart and Williams (1978).

The geologic review is a critical part of the evaluation process of a proposed development. The *reviewing geologist* ensures compliance with existing laws, regulations, ordinances, codes, policies, standards, and technically sound practice, helping to assure that significant geologic factors (hazards and geologic processes) are properly considered, and potential problems are mitigated prior to project development. In addition to geologic reports for tentative tracts and site development, a reviewer may also evaluate Environmental Impact Reports, Seismic Safety and Public Safety Elements of General Plans, reclamation plans, as-graded geologic reports, and final, as-built geologic maps and reports. Generally, the reviewer acts at the discretion or request of, and on behalf of a *lead agency* -- city, county, regional, state, federal -- not only to protect the government's interest but also to protect the interest of the community at large. Because the *A-P Act* requires that the *lead agency* "…prohibit the location of developments and structures for human occupancy across the trace of active faults.", it is important to recognize that the *reviewing geologist*, as the *lead agency's* technical representative, is assessing the *lead agency's* exposure to liability resulting from non-compliance with the requirements of the *A-P Act* and regulations. Examples of the review process in a state agency are described by Stewart and others (1976). Review at the local level has been discussed by Leighton (1975), Berkland (1992), Larson (1992; 2015), and others. Grading codes, inspections, and the review process are discussed in detail by Scullin (1983). Nelson and Christenson (1992) and Lund and others (2016) specifically discuss review guidelines for reports on surface faulting.

The review process will be streamlined if the expectations of the *lead agency* are clear and consistently applied. As noted in Section 5, discussions between the *project*

geologist and the *lead agency*'s *reviewing geologist* during all phases of a *project* can benefit all parties involved. Some *lead agencies* may also choose to publish required minimum standards for surface fault rupture hazard studies. Appendix D contains examples of state, county, and city policies, actions, guidelines and ordinances to assist the *reviewing geologist* in developing clear expectations of what constitutes a thorough fault investigation. These examples can also be used to update *lead agency* ordinance documents or guidelines.

6.3 The Reviewer

Qualifications

In order to make appropriate evaluations of geologic reports, the reviewer should be an experienced geologist familiar with the investigative methods employed and the techniques available to the profession. Even so, the reviewer must know his or her limitations, and at times ask for the opinions of others more qualified in specialty fields (e.g., paleoseismology, radiometric dating, soils, geophysics, ground water, foundation and seismic engineering, seismology). With respect to the *A-P Act*, the *reviewing geologist* is required by the State Mining and Geology Board (SMGB) to be licensed by the Board for Professional Engineers, Land Surveyors, and Geologists in order to review *fault investigation reports*. The SMGB also certifies engineering geologists and hydrogeologists, and licenses geophysicists and engineers. Local and regional agencies may have additional requirements.

The reviewer has an ethical obligation to ensure a *fault investigation report* has thoroughly addressed the potential for *surface fault rupture* for any *fault investigation* triggered by the *A-P Act* or local regulations. Like any review process, there is a certain "give-and-take" involved between the *reviewing geologist* and *project geologist*. The reviewer should bear in mind that some *project geologists* are not accomplished writers, and almost all are working with restricted budgets. Also, the reviewer may by limited by his or her agency's policies, procedures, and fee structures. The mark of a good reviewer is the ability to sort out the important from the insignificant and to make constructive comments and recommendations and maintain a professional tone.

If there is clear evidence of incompetence or misrepresentation in a report, this fact should be reported to the reviewing agency or licensing board. California Civil Code Section 47 provides an immunity for statements made "in the initiation or course of any other proceedings authorized by law." Courts have interpreted this section as providing immunity to letters of complaint written to provide a public agency or board, including licensing boards, with information that the public board or agency may want to investigate (see King v. Borges, 28 Cal. App. 3d 27 [1972]; and Brody v. Montalbano, 87 Cal. App. 3d 725 [1978]). Clearly, the reviewer needs to have the support of his or her agency in order to carry out these duties.

A reviewer may be employed full time by the *lead agency* or serve as a contractor to the *lead agency*. Also, one reviewing agency (such as a city) may contract with another agency (such as a county) to perform geologic reviews. The best reviews generally are

performed by experienced reviewers. The use of multiple, part-time reviewers by a given agency may contribute to an inconsistent treatment of development projects because different reviewers may have different standards or levels of experience. The primary purpose of the review procedure should always be kept in mind -- namely, to assure the adequacy of geologic investigations.

Other Review Functions

Aside from his or her duties as a reviewer, the *reviewing geologist* also must interpret the geologic data reported to other agency personnel who regulate development (e.g., planners, engineers, and inspectors). Also, the *reviewing geologist* sometimes is called upon to make investigations for his or her own agency. This is common where a city or county employs only one geologist. In fact, some reviewers routinely divide their activities between reviewing the reports of others and performing one or several other tasks for the employing agency (such as advising other agency staff and boards on geologic matters; making public presentations) (see Leighton, 1975).

Conflict of Interest

In cases where a *reviewing geologist* also must perform geologic investigations, he or she should never be placed in the position of reviewing his or her own report, for that is no review at all. A different type of conflict commonly exists in a jurisdiction where the geologic review is performed by a consulting geologist who also is practicing commercially (performing geologic investigations) within the same jurisdictional area. Such situations should be avoided.

6.4 Geologic Review

The Report

The critical item in evaluating specific site investigations for adequacy is the resulting geologic report. A report that is incomplete or poorly written cannot be evaluated and should not be approved. As an expediency, some reviewers accept inadequate or incomplete reports based on familiarity or direct experience at, or near a site. However, unless good reasons can be provided in writing, it is recommended that a report not be accepted until it presents the pertinent facts correctly and completely.

The reviewer performs four principal functions in the technical review:

1. Identifies any known potential hazards and impacts that are not addressed in the consultant's report. The reviewer should require investigation of the potential hazards and impacts;
2. Determines whether the report contains sufficient data to support and is consistent with the stated conclusions;
3. Determines whether the conclusions identify the potential impact of known and reasonable anticipated geologic processes and site conditions; and,

4. Determines whether the recommendations are consistent with the conclusions and can reasonably be expected to mitigate those anticipated earthquake-related problems that could have a significant impact on the proposed development. The included recommendations also should address the need for additional geologic and engineering investigations (including any site inspections to be made as site remediation proceeds).

The conclusions presented in the report regarding the geologic hazards must be separate from and supported by the investigative data. An indication regarding the level of confidence in the conclusions should be provided. Recommendations based on the conclusions should be made to mitigate those geology-related issues that would have an impact on the proposed development. Recommendations also should be made concerning the need for additional geologic investigations if necessary.

Report Guidelines and Standards

A *project geologist* may save a great deal of time and avoid misunderstandings, if he or she contacts the *reviewing geologist* at the initiation of the investigation. The reviewer should not only be familiar with the local geology and sources of information, but also should be able to provide specific guidelines for investigative reports and procedures to be followed. Guidelines and check-lists for geologic or geotechnical reports have been prepared by a number of reviewing agencies and are available to assist the reviewer in his or her evaluation of reports (e.g., CGS Notes 41, 48; California Geological Survey, 1997; 1997; 2013). A reviewer also may wish to prepare his or her own guidelines or check-lists for specific types of reviews.

If a reviewer has questions about an investigation, these questions must be communicated in writing to the *project geologist* for response. After the reviewer is satisfied that the investigation and resulting conclusions are adequate, this should be clearly indicated in writing to the *lead agency* so that the proposed development application may be processed promptly. One of the more important responsibilities of the reviewer should be implementation of requirements assuring report recommendations are incorporated and appropriate consultant inspections are made.

A significant challenge the reviewer faces is the identification of standards. These questions must be asked: “Are the methods of investigation appropriate for a given site?” and, “Was the investigation conducted according to existing standards of practice?” Answers to these questions lie in the report being reviewed. For example, a nearby mapped fault should be portrayed on a geologic map of the site. The conclusion that a hazard is absent, where previously reported or suspected, should be documented by stating which investigative steps were taken and precisely what was observed. The reviewer must evaluate each investigative step according to existing standards. It should be recognized that existing standards of practice generally set minimum requirements (Keaton, 1993). Often the reviewer is forced to clarify the standards, or even introduce new ones, for a specific purpose. If the *project geologist* concludes that fault is absent, this conclusion should be based on the evidence of absence and not the absence of evidence for *surface fault rupture* hazard.

Scope of Review

The scope of the review is determined primarily by the need to assure that an investigation and resulting conclusions are supported by the geologic data developed during the investigation. The reviewer may wish to check cited references or other sources of data, such as aerial photographs and unpublished records. Reviewers also may inspect the development site and examine excavations and borehole samples. Field reviews of trench exposures and inspection of cores and samples are of value and may help to identify and resolve different interpretations. Also, if the reviewer is not familiar with the general site conditions, a brief field visit provides perspective and a visual check on the reported conditions.

As important as reviewing a report for completeness, the reviewing geologist should keep in mind that the conclusions in the report must be data driven in order for the report to be technically sound. Primary questions the *reviewing geologist* should ask during the course of the review are:

1. Are the conclusions in the *fault investigation report* reasonable given the data presented?
2. Is there a clear distinction between data and observations versus interpretations and/or models?
3. If a conclusion is model driven, are there alternative models that also satisfy the available data?
4. If one model is preferred over others, what supporting data allow the alternative models to be down-weighted or rejected?

Review Records

For each report and development project reviewed, a clear, concise, and logical written record should be developed. This review record should be as detailed as is necessary, depending upon the complexity of the project, the geology, and the quality and completeness of the reports submitted. At a minimum, the record should:

1. Identify the project, permits, applicant, consultants, reports, and plans reviewed;
2. Include a clear statement of the requirements to be met by the parties involved, data required, and the plan, phase, project, or report being considered;
3. Contain summaries of the reviewer's field observations, associated literature and aerial photographic review, and oral communications with the applicant and the consultant;
4. Contain copies of any pertinent written correspondence; and,
5. The reviewer's name and California Professional Geologist license number(s), with expiration dates and stamped with his or her seal.

The report, plans, and review record should be kept in perpetuity to document that compliance with local requirements was achieved and for reference during future development, remodeling, or rebuilding. Such records also can be a valuable resource for

land-use planning and real estate disclosure. In addition, the Policies and Criteria of the *State Mining and Geology Board* (Appendix B) requires that copies of all approved *fault investigation reports* be submitted to the *State Geologist* within 30 days of project approval (CCR, Title 14, Division 2, Chapter 8.1.3, 3603(f)).

Appeals

In cases where the reviewer is not able to approve a geologic report, or can accept it only on a conditional basis, the developer may wish to appeal the review decision or recommendations. However, every effort should be made to resolve problems informally prior to making a formal appeal. An appeal should be handled through existing local procedures (such as a hearing by a County Board of Supervisors or a City Council) or by a specially appointed Technical Appeals and Review Panel comprised of geoscientists, engineers, and other appropriate professionals. Adequate notice should be given to allow time for both sides to prepare their cases. After an appropriate hearing, the appeals decision should be in writing as part of the permanent record.

Another way to remedy conflicts between the investigator and the reviewer is by means of a third party review. Such a review can take different paths ranging from the review of existing reports to in-depth field investigations. Third party reviews are usually done by consultants not normally associated with the reviewing/permitting agency.

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APPENDIX A: ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT

Disclaimer: The excerpted text of the Alquist-Priolo Earthquake Fault Zoning Act is for informational purposes only and may not the most current version of the statute. For the most current version of the statues, please refer to:

http://leginfo.legislature.ca.gov/faces/codes.xhtml

CALIFORNIA PUBLIC RESOURCES CODE

DIVISION 2. Geology, Mines and Mining

CHAPTER 7.5 Earthquake Fault Zones

2621. This chapter shall be known and may be cited as the Alquist-Priolo Earthquake Fault Zoning Act.

2621.5. (a) It is the purpose of this chapter to provide for the adoption and administration of zoning laws, ordinances, rules, and regulations by cities and counties in implementation of the general plan that is in effect in any city or county. The Legislature declares that this chapter is intended to provide policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults. Further, it is the intent of this chapter to provide the citizens of the state with increased safety and to minimize the loss of life during and immediately following earthquakes by facilitating seismic retrofitting to strengthen buildings, including historical buildings, against ground shaking.

(b) This chapter is applicable to any project, as defined in Section 2621.6, which is located within a delineated earthquake fault zone, upon issuance of the official earthquake fault zones maps to affected local jurisdictions, except as provided in Section 2621.7.

(c) The implementation of this chapter shall be pursuant to policies and criteria established and adopted by the Board.

2621.6. (a) As used in this chapter, “project” means either of the following:

(1) Any subdivision of land which is subject to the Subdivision Map Act, (Division 2 (commencing with Section 66410) of Title 7 of the Government Code), and which contemplates the eventual construction of structures for human occupancy.

(2) Structures for human occupancy, with the exception of either of the following:

(A) Single-family wood-frame or steel-frame dwellings to be built on parcels of land for which geologic reports have been approved pursuant to paragraph (1).

(B) A single-family wood-frame or steel-frame dwelling not exceeding two stories when that dwelling is not part of a development of four or more dwellings.

(b) For the purposes of this chapter, a mobilehome whose body width exceeds eight feet shall be considered to be a single-family wood-frame dwelling not exceeding two stories.

2621.7. This chapter, except Section 2621.9, shall not apply to any of the following:

(a) The conversion of an existing apartment complex into a condominium.

(b) Any development or structure in existence prior to May 4, 1975, except for an alteration or addition to a structure that exceeds the value limit specified in subdivision (c).

(c) An alteration or addition to any structure if the value of the alteration or addition does not exceed 50 percent of the value of the structure.

(d) (1) Any structure located within the jurisdiction of the City of Berkeley or the City of Oakland which was damaged by fire between October 20, 1991, and October 23, 1991, if granted an exemption pursuant to this subdivision.

(2) The city may apply to the State Geologist for an exemption and the State Geologist shall grant the exemption only if the structure located within the earthquake fault zone is not situated upon a trace of an active fault line, as delineated in an official earthquake fault zone map or in more recent geologic data, as determined by the State Geologist.

(3) When requesting an exemption, the city shall submit to the State Geologist all of the following information:

(A) Maps noting the parcel numbers of proposed building sites that are at least 50 feet from an identified fault and a statement that there is not any more recent information to indicate a geologic hazard.

(B) Identification of any sites within 50 feet of an identified fault.

(C) Proof that the property owner has been notified that the granting of an exemption is not any guarantee that a geologic hazard does not exist.

(4) The granting of an exemption does not relieve a seller of real property or an agent for the seller of the obligation to disclose to a prospective purchaser that

the property is located within a delineated earthquake fault zone, as required by Section 2621.9.

(e) (1) Alterations which include seismic retrofitting, as defined in Section 8894.2 of the Government Code, to any of the following listed types of buildings in existence prior to May 4, 1975:

(A) Unreinforced masonry buildings, as described in subdivision (a) of Section 8875 of the Government Code.

(B) Concrete tilt-up buildings, as described in Section 8893 of the Government Code.

(C) Reinforced concrete moment resisting frame buildings as described in Applied Technology Council Report 21 (FEMA Report 154).

(2) The exemption granted by paragraph (1) shall not apply unless a city or county acts in accordance with all of the following:

(A) The building permit issued by the city or county for the alterations authorizes no greater human occupancy load, regardless of proposed use, than that authorized for the existing use permitted at the time the city or county grants the exemption. This may be accomplished by the city or county making a human occupancy load determination that is based on, and no greater than, the existing authorized use, and including that determination on the building permit application as well as a statement substantially as follows: “Under subparagraph (A) of paragraph (2) of subdivision (e) of Section 2621.7 of the Public Resources Code, the occupancy load is limited to the occupancy load for the last lawful use authorized or existing prior to the issuance of this building permit, as determined by the city or county.”

(B) The city or county requires seismic retrofitting, as defined in Section 8894.2 of the Government Code, which is necessary to strengthen the entire structure and provide increased resistance to ground shaking from earthquakes.

(C) Exemptions granted pursuant to paragraph (1) are reported in writing to the State Geologist within 30 days of the building permit issuance date.

(3) Any structure with human occupancy restrictions under subparagraph (A) of paragraph (2) shall not be granted a new building permit that allows an increase in human occupancy unless a geologic report, prepared pursuant to subdivision (d) of Section 3603 of Title 14 of the California Code of Regulations in effect on January 1, 1994, demonstrates that the structure is not on the trace of an active fault, or the requirement of a geologic report has been waived pursuant to Section 2623.

(4) A qualified historical building within an earthquake fault zone that is exempt pursuant to this subdivision may be repaired or seismically retrofitted using the State Historical Building Code, except that, notwithstanding any provision of that building code and its implementing regulations, paragraph (2) shall apply.

2621.8. Notwithstanding Section 818.2 of the Government Code, a city or county which knowingly issues a permit that grants an exemption pursuant to subdivision (e) of Section 2621.7 that does not adhere to the requirements of paragraph (2) of subdivision (e) of Section 2621.7, may be liable for earthquake-related injuries or deaths caused by failure to so adhere.

2621.9. (a) A person who is acting as an agent for a transferor of real property that is located within a delineated earthquake fault zone, or the transferor, if he or she is acting without an agent, shall disclose to any prospective transferee the fact that the property is located within a delineated earthquake fault zone.

(b) Disclosure is required pursuant to this section only when one of the following conditions is met:

(1) The transferor, or the transferor's agent, has actual knowledge that the property is within a delineated earthquake fault zone.

(2) A map that includes the property has been provided to the city or county pursuant to Section 2622, and a notice has been posted at the offices of the county recorder, county assessor, and county planning agency that identifies the location of the map and any information regarding changes to the map received by the county.

(c) In all transactions that are subject to Section 1103 of the Civil Code, the disclosure required by subdivision (a) of this section shall be provided by either of the following means:

(1) The Local Option Real Estate Transfer Disclosure Statement as provided in Section 1102.6a of the Civil Code.

(2) The Natural Hazard Disclosure Statement as provided in Section 1103.2 of the Civil Code.

(d) If the map or accompanying information is not of sufficient accuracy or scale that a reasonable person can determine if the subject real property is included in a delineated earthquake fault hazard zone, the agent shall mark "Yes" on the Natural Hazard Disclosure Statement. The agent may mark "No" on the Natural Hazard Disclosure Statement if he or she attaches a report prepared pursuant to subdivision (c) of Section 1103.4 of the Civil Code that verifies the property is not in the hazard zone. Nothing in this subdivision is intended to limit or abridge any

existing duty of the transferor or the transferor's agents to exercise reasonable care in making a determination under this subdivision.

(e) For purposes of the disclosures required by this section, the following persons shall not be deemed agents of the transferor:

(1) Persons specified in Section 1103.11 of the Civil Code.

(2) Persons acting under a power of sale regulated by Section 2924 of the Civil Code.

(f) For purposes of this section, Section 1103.13 of the Civil Code shall apply.

(g) The specification of items for disclosure in this section does not limit or abridge any obligation for disclosure created by any other provision of law or that may exist in order to avoid fraud, misrepresentation, or deceit in the transfer transaction.

2622. (a) In order to assist cities and counties in their planning, zoning, and building-regulation functions, the State Geologist shall delineate, by December 31, 1973, appropriately wide earthquake fault zones to encompass all potentially and recently active traces of the San Andreas, Calaveras, Hayward, and San Jacinto Faults, and such other faults, or segments thereof, as the State Geologist determines to be sufficiently active and well-defined as to constitute a potential hazard to structures from surface faulting or fault creep. The earthquake fault zones shall ordinarily be one-quarter mile or less in width, except in circumstances which may require the State Geologist to designate a wider zone.

(b) Pursuant to this section, the State Geologist shall compile maps delineating the earthquake fault zones and shall submit the maps to all affected cities, counties, and state agencies, not later than December 31, 1973, for review and comment. Concerned jurisdictions and agencies shall submit all comments to the State Mining and Geology Board for review and consideration within 90 days. Within 90 days of such review, the State Geologist shall provide copies of the official maps to concerned state agencies and to each city or county having jurisdiction over lands lying within any such zone.

(c) The State Geologist shall continually review new geologic and seismic data and shall revise the earthquake fault zones or delineate additional earthquake fault zones when warranted by new information. The State Geologist shall submit all revised maps and additional maps to all affected cities, counties, and state agencies for their review and comment. Concerned jurisdictions and agencies shall submit all comments to the State Mining and Geology Board for review and consideration within 90 days. Within 90 days of that review, the State Geologist shall provide copies of the revised and additional official maps to concerned state agencies and to each city or county having jurisdiction over lands lying within the earthquake fault zone.

(d) In order to ensure that sellers of real property and their agents are adequately informed, any county that receives an official map pursuant to this section shall post a notice within five days of receipt of the map at the offices of the county recorder, county assessor, and county planning commission, identifying the location of the map and the effective date of the notice.

2623. (a) The approval of a project by a city or county shall be in accordance with policies and criteria established by the State Mining and Geology Board and the findings of the State Geologist. In the development of such policies and criteria, the State Mining and Geology Board shall seek the comment and advice of affected cities, counties, and state agencies. Cities and counties shall require, prior to the approval of a project, a geologic report defining and delineating any hazard of surface fault rupture. If the city or county finds that no undue hazard of that kind exists, the geologic report on the hazard may be waived, with the approval of the State Geologist.

(b) After a report has been approved or a waiver granted, subsequent geologic reports shall not be required, provided that new geologic data warranting further investigations is not recorded.

(c) The preparation of geologic reports that are required pursuant to this section for multiple projects may be undertaken by a geologic hazard abatement district.

2624. Notwithstanding any provision of this chapter, cities and counties may do any of the following:

(1) Establish policies and criteria which are stricter than those established by this chapter.

(2) Impose and collect fees in addition to those required under this chapter.

(3) Determine not to grant exemptions authorized under this chapter.

2625. (a) Each applicant for approval of a project may be charged a reasonable fee by the city or county having jurisdiction over the project.

(b) Such fees shall be set in an amount sufficient to meet, but not to exceed, the costs to the city or county of administering and complying with the provisions of this chapter.

(c) The geologic report required by Section 2623 shall be in sufficient detail to meet the criteria and policies established by the State Mining and Geology Board for individual parcels of land.

2630. In carrying out the provisions of this chapter, the State Geologist and the board shall be advised by the Seismic Safety Commission.

SIGNED INTO LAW DECEMBER 22, 1972; AMENDED SEPTEMBER 16, 1974, MAY 4, 1975, SEPTEMBER 28, 1975, SEPTEMBER 22, 1976, SEPTEMBER 27, 1979, SEPTEMBER 21, 1990, JULY 29, 1991, AUGUST 16, 1992, JULY 25, 1993, OCTOBER 7, 1993, AND OCTOBER 7, 1997.

APPENDIX B: POLICIES AND CRITERIA OF THE STATE MINING AND GEOLOGY BOARD

With Reference to the Alquist-Priolo Earthquake Fault Zoning Act

Disclaimer: The excerpted text from the California Code of Regulations, Title 14, Division 2 is for informational purposes only and may not the most current version of the regulations. For the most current version of the regulations, please refer to the online version of the California Code of Regulations:

https://govt.westlaw.com/SiteList

3600. Purpose.

It is the purpose of this subchapter to set forth the policies and criteria of the State Mining and Geology Board, hereinafter referred to as the "Board," governing the exercise of city, county, and state agency responsibilities to prohibit the location of developments and structures for human occupancy across the trace of active faults in accordance with the provisions of Public Resources Code Section 2621 et seq. (Alquist-Priolo Earthquake Fault Zoning Act). The policies and criteria set forth herein shall be limited to potential hazards resulting from surface faulting or fault creep within earthquake fault zones delineated on maps officially issued by the State Geologist.

NOTE: Authority cited: Section 2621.5, Public Resources Code. Reference: Sections 2621-2630, Public Resources Code.

3601. Definitions.

The following definitions as used within the Act and herein shall apply:

(a) An "active fault" is a fault that has had surface displacement within Holocene time (about the last 11,000 years), hence constituting a potential hazard to structures that might be located across it.

(b) A "fault trace" is that line formed by the intersection of a fault and the earth's surface, and is the representation of a fault as depicted on a map, including maps of earthquake fault zones.

(c) A "lead agency" is the city or county with the authority to approve projects.

(d) "Earthquake fault zones" are areas delineated by the State Geologist, pursuant to the Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Section 2621 et seq.) and this subchapter, which encompass the traces of active faults.

(e) A "structure for human occupancy" is any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year.

(f) “Story” is that portion of a building included between the upper surface of any floor and the upper surface of the floor next above, except that the topmost story shall be that portion of a building included between the upper surface of the topmost floor and the ceiling or roof above. For the purpose of the Act and this subchapter, the number of stories in a building is equal to the number of distinct floor levels, provided that any levels that differ from each other by less than two feet shall be considered as one distinct level.

NOTE: Authority cited: Section 2621.5, Public Resources Code. Reference: Sections 2621-2630, Public Resources Code.

3602. Review of Preliminary Maps.

(a) Within 45 days from the issuance of proposed new or revised preliminary earthquake fault zone map(s), cities and counties shall give notice of the Board’s announcement of a ninety (90) day public comment period to property owners within the area of the proposed zone. The notice shall be by publication, or other means reasonably calculated to reach as many of the affected property owners as feasible. Cities and counties may also give notice to consultants who may conduct geologic studies in fault zones. The notice shall state that its purpose is to provide an opportunity for public comment including providing to the Board geologic information that may have a bearing on the proposed map(s).

(b) The Board shall also give notice by mail to those California Registered Geologists and California Registered Geophysicists on a list provided by the State Board of Registration for Geologists and Geophysicists. The notice shall indicate the affected jurisdictions and state that its purpose is to provide an opportunity to present written technical comments that may have a bearing on the proposed zone map(s) to the Board during a 90-day public comment period.

(c) The Board shall receive public comments during the 90-day public comment period. The Board shall conduct at least one public hearing on the proposed zone map(s) during the 90-day public comment period.

(d) Following the end of the 90-day public comment period, the Board shall forward its comments and recommendations with supporting data received to the State Geologist for consideration prior to the release of official earthquake fault zone map(s).

NOTE: Authority cited: Section 2621.5, Public Resources Code. Reference: Section 2622, Public Resources Code.

3603. Specific Criteria.

The following specific criteria shall apply within earthquake fault zones and shall be used by affected lead agencies in complying with the provisions of the Act:

(a) No structure for human occupancy, identified as a project under Section 2621.6 of the Act, shall be permitted to be placed across the trace of an active fault.

Furthermore, as the area within fifty (50) feet of such active faults shall be presumed to be underlain by active branches of that fault unless proven otherwise by an appropriate geologic investigation and report prepared as specified in Section 3603(d) of this subchapter, no such structures shall be permitted in this area.

(b) Affected lead agencies, upon receipt of official earthquake fault zones maps, shall provide for disclosure of delineated earthquake fault zones to the public. Such disclosure may be by reference in general plans, specific plans, property maps, or other appropriate local maps.

(c) No change in use or character of occupancy, which results in the conversion of a building or structure from one not used for human occupancy to one that is so used, shall be permitted unless the building or structure complies with the provisions of the Act.

(d) Application for a development permit for any project within a delineated earthquake fault zone shall be accompanied by a geologic report prepared by a geologist registered in the State of California, which is directed to the problem of potential surface fault displacement through the project site, unless such report is waived pursuant to Section 2623 of the Act. The required report shall be based on a geologic investigation designed to identify the location, recency, and nature of faulting that may have affected the project site in the past and may affect the project site in the future. The report may be combined with other geological or geotechnical reports.

(e) A geologist registered in the State of California, within or retained by each lead agency, shall evaluate the geologic reports required herein and advise the lead agency.

(f) One (1) copy of all such geologic reports shall be filed with the State Geologist by the lead agency within thirty (30) days following the report's acceptance. The State Geologist shall place such reports on open file.

NOTE: Authority cited: Section 2621.5, Public Resources Code. Reference: Sections 2621.5, 2622, 2623, and 2625(c), Public Resources Code.

ADOPTED NOVEMBER 23, 1973; REVISED JULY 1, 1974, AND JUNE 26, 1975.
CODIFIED IN CALIFORNIA CODE OF REGULATIONS JANUARY 31, 1979;
REVISED OCTOBER 18, 1984, JANUARY 5, 1996, AND APRIL 1, 1997.

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APPENDIX C: THE CALIFORNIA GEOLOGICAL SURVEY'S FAULT EVALUATION AND ZONING PROGRAM

C.1 Fault Evaluation and Zoning Program

The Fault Evaluation and Zoning Program was initiated in early 1976 for the purpose of evaluating those "other faults" identified in the Act as "sufficiently active and well-defined" (see definitions below) after it was recognized that effective future zoning could not rely solely on the limited fault data of others. Justification of this program is discussed in more detail in Special Publication 47 of the Division of Mines and Geology (1976; also see Hart, 1978).

The program originally was scheduled over a 10-year period. The state was divided into 10 regions or work areas, with one region scheduled for evaluation each year. However, the work in some regions was extended because of heavy workloads. Fault evaluation work includes interpretation of aerial photographs and limited field mapping, as well as the use of other geologists' works. A list of faults to be evaluated in a target region was prepared and priorities assigned. The list included potentially active faults not yet zoned, as well as previously zoned faults or fault-segments that warranted zone revisions (change or deletion). Faults also were evaluated in areas outside of scheduled regions, as the need arose (e.g., to map fault rupture immediately after an earthquake). The fault evaluation work was completed in early 1991. The work is summarized for each region in Open-File Reports (OFR) 77-8, 78-10, 79-10, 81-3, 83-10, 84-52, 86-3, 88-1, 89-16, and 91-9.

For each fault evaluated by CGS since 1976 a Fault Evaluation Report (FER) has been prepared, summarizing data on the location, recency of activity, sense and magnitude of displacement, and providing recommendations for or against zoning. FERs that resulted in *Earthquake Fault Zones (EFZ)* are available through the Information warehouse on the CGS web page (http://maps.conservation.ca.gov/cgs/informationwarehouse/). FERs that did not recommend *EFZs* be delineated are available from CGS by request.

Faults zoned since 1976 are considered to meet the criteria of "sufficiently active and well-defined" (see Definitions below). Many other faults do not appear to meet the criteria and have not been zoned. It is important to note that it is sometimes difficult to distinguish between slightly active faults and inactive ones, because the surface features formed as a result of minor, infrequent rupture are easily obliterated by geologic processes (erosion, sedimentation, mass wasting) or human activities. Even large scale fault-rupture can be obscured in complex geologic terranes or high-energy environments. Recent fault-rupture is challenging to detect where it is distributed as numerous breaks or warps in broad zones of deformation. As a consequence of these problems, it is not possible to identify and zone all active faults in California. For the most part, rupture on faults not identified as active is expected to be minor.

Under the AP Act (Sec. 2622), the State Geologist has an on-going responsibility to review "new geologic and seismic data" in order to revise *EFZ* and to delineate new zones

"when warranted by new information." Much of this new information comes to the State Geologist through fault investigation reports triggered as a result of existing *EFZs*, but also from fault investigations conducted where zones have not been delineated. These investigation reports are used to update existing zones as well as prepare new *EFZs*. They have also been used to file waivers and are often sought by *project geologists* when designing site-specific fault investigations. In accordance with the policies and Criteria of the State Mining and Geology Board (California Code of Regulations, Title 14, Division 2, Section 3603(f)), these reports are available on the CGS website: (https://spatialservices.conservation.ca.gov/arcgis/rest/services/CGS).

C.2 Fault Zoning Criteria

A major objective of CGS's continuing Fault Evaluation and Zoning Program is to evaluate the hundreds of remaining potentially active faults in California for zoning consideration. However, it became apparent as the program progressed that there are so many potentially active (i.e., Quaternary) faults in the state (Jennings, 1975) that it would be meaningless to zone all of them. In late 1975, the State Geologist made a policy decision to zone only those potentially active faults that have a relatively high potential for ground rupture. To facilitate this, the terms "sufficiently active" and "well-defined," from Section 2622 of the Act, were defined for application in zoning faults other than the four named in the Act. These two terms constitute the present criteria used by the State Geologist in determining if a given fault should be zoned under the Alquist-Priolo Act.

Sufficiently active. A fault is deemed sufficiently active if there is evidence of Holocene surface displacement along one or more of its segments or branches. Holocene surface displacement may be directly observable or inferred; it need not be present everywhere along a fault to qualify that fault for zoning.

Well-defined. A fault is considered well-defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic evidence or geophysical techniques). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

Determining if a fault is sufficiently active and well-defined is sometimes a matter of experienced judgment. However, these definitions provide standard, workable guidelines for establishing *Earthquake Fault Zones* under the Act.

The evaluation of faults for zoning purposes is done with the realization that not all active faults can be identified as active. Furthermore, certain faults considered to be active at depth, because of known seismic activity, are so poorly defined at the surface that zoning becomes too uncertain. Although the map explanation indicates that "potentially active" (i.e., Quaternary) faults are identified and zoned (with exceptions) on the Official Maps of Earthquake Fault Zones until 1988, this is basically true only for those maps issued July 1, 1974 and January 1, 1976. Even so, all of the principal faults zoned in 1974 and 1976 were active during Holocene time, if not historically. Beginning with the

maps of January 1, 1977, all faults zoned meet the criteria of "sufficiently active and well-defined."

C.3 Delineating the Earthquake Fault Zones

Earthquake Fault Zones are delineated on U.S. Geological Survey topographic base maps at a scale of 1:24,000 (1 inch equals 2,000 feet). On older Earthquake Fault Zone maps, the zone boundaries are straight-line segments defined by turning points. Most of the turning points were intended to coincide with locatable features on the ground (e.g., bench marks, roads, streams). Neither the turning points nor the connecting zone boundaries have been surveyed to verify their mapped locations. EFZ maps prepared as of 2012 or later, and those revised/combined with Seismic Hazard Zone Maps, do not portray turning points. This change was made because the GIS data that serve as the official zone maps and modern GPS technology has made the need to locate cultural features in the field to identify zone boundaries obsolete.

Locations of Earthquake Fault Zone boundaries are controlled by the position of fault traces shown on the Official Maps of Earthquake Fault Zones. With few exceptions, the faults shown on the 1974 and 1976 Earthquake Fault Zones maps were not field-checked during the compilation of these maps. However, nearly all faults zoned since January 1, 1977 have been evaluated in the field or on aerial photographs to verify that they do meet the criteria of being sufficiently active and well defined.

Zone boundaries on early maps were positioned about 660 feet (200 meters) away from the fault traces to accommodate imprecise locations of the faults and possible existence of active branches. The policy since 1977 is to position the EFZ boundary about 500 feet (150 meters) away from major active faults and about 200 to 300 feet (60 to 90 meters) away from well-defined, minor faults. Exceptions to this policy exist where faults are locally complex or where faults are not vertical.

C.4 Products of the A-P Program

Reports listed in this Appendix that are publications of the California Geological Survey are available from the California Geological Survey website:
http://www.conservation.ca.gov/cgs/publications/Pages/index.aspx

For more information on the A-P Program at CGS please go to the CGS website:
http://www.conservation.ca.gov/cgs/rghm/ap/Pages/Index.aspx

Earthquake Fault Zone Maps are available as GIS Shapefiles or GeoPDF files and Fault Evaluation Reports are available as PDF files, all downloadable from the CGS Information Warehouse:
http://maps.conservation.ca.gov/cgs/informationwarehouse/

Earthquake Fault Zones are available as web-based services that can be viewed on your GIS platform or in Google Earth from the following URL:
https://spatialservices.conservation.ca.gov/arcgis/rest/services/CGS_Earthquake_Hazard_Zones

and associated metadata can be found at:
https://maps.conservation.ca.gov/cgs/metadata/SHP_Fault_Zones.html

The CGS web application that allows one to determine if a parcel lies within Earthquake Fault Zones or Seismic Hazard Zones can be found here:
https://maps.conservation.ca.gov/cgs/EQZApp/

Fault Investigation Reports prepared by *project geologists* can be found at:
https://spatialservices.conservation.ca.gov/arcgis/rest/services/CGS

APPENDIX D: MODEL ORDINANCE AND EXAMPLES OF LEAD AGENCY IMPLEMENTATION OF THE ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT

Appendix D contains examples of approaches to implementation of the *A-P Act* by some *lead agencies* in California as links to the jurisdiction's websites. The examples in this Appendix are intended to assist other *lead agencies* in developing or updating their safety elements, ordinances, policies, and other documents to better implement the *A-P Act* within their jurisdictions. This is not an exhaustive compilation but simply the results from an internet search of lead agencies known to have earthquake fault zones within their jurisdictions. These links were last tested in December, 2017.

California State Agencies

The California Department of General Services, Division of the State Architect, has been responsible for overseeing school construction in California since the 1933 Long Beach earthquake, which destroyed or severely damaged many school buildings in Los Angeles and Orange counties. The provisions for addressing fault rupture hazards are found in the California Administrative Code 2016, Group 1 Safety of Construction of Public Schools, Article 3 Approval of Drawings and Specifications, 4-1317 Plans, specifications, calculations and other data, (e) Site Data.

https://up.codes/viewer/california/ca-administrative-code-2016/chapter/group_1/safety-of-construction-of-public-schools#4-317

California Counties

Alameda County:

Safety Element; see Chapter 1: Natural Hazards.
https://www.acgov.org/cda/planning/generalplans/documents/SafetyElementAmendmentFinal.pdf

Municipal Code, Chapter 15.36; see Section 15.36.240 – Preliminary grading plans, and Section 15.36.320 – Geotechnical/geologic investigation required.
https://library.municode.com/ca/alameda_county/codes/code_of_ordinances?nodeId=TIT15BUCO_CH15.36GRERSECO_ARTVPERE

Alpine County:

Safety Element; see Section B – Seismic, page 44.
http://www.alpinecountyca.gov/DocumentCenter/View/51

Butte County:

Health and Safety Element; see Section III – Seismic and Geologic Hazards, page 299.
http://www.buttegeneralplan.net/products/2012-11-06_GPA_ZO_Adopted/General_Plan_Seperate_Chapters/11_Health_Safety_PRR.pdf

Butte County Code; see Section 20-255 – Filing and processing.
https://library.municode.com/ca/butte_county/codes/code_of_ordinances?nodeId=CH20SU_ARTXESREVETEMARESU_20-255FIPR

Contra Costa County:

Safety Element; see page 10-7.
http://www.co.contra-costa.ca.us/DocumentCenter/View/30920

Contra Costa County Code; see Section 92-4.035 - Geologic hazard or potentially hazardous soil conditions.
https://library.municode.com/ca/contra_costa_county/codes/ordinance_code?nodeId=TIT9SU_DIV92GEPR_CH92-4DE_92-4.035GEHAPOHASOCO

Humboldt County:

Safety Element, see page 14-2.
http://www.humboldtgov.org/DocumentCenter/Home/View/61990

Title III, Land Use and Development, Division 3, Building Regulations, Chapter 6 – Geologic Hazards.
http://www.humboldtgov.org/DocumentCenter/Home/View/210

Imperial County:

Seismic and Public Safety Element.
http://www.icpds.com/CMS/Media/Seismic-and-Public-Safety-Element.pdf

County of Imperial, California – Codified Ordinances; see Title 9 – Land Use Code sections 91502.00 - Standards for residential dwelling unit in special studies zones, 91502.01 – Application Requirements, 91502.02 – Approvals, 90803.02 - Tentative map to conform to rules of planning director, planning commission and the board of supervisors, 91701.01 - General standards.

https://library.municode.com/ca/imperial_county/codes/code_of_ordinances?nodeId=COUNTY_IMPERIAL_CALIFORNIACOOR

Inyo County:

Inyo County Plans, Laws, and Ordinances, see Alquist-Priolo Earthquake Fault Zoning Act.
http://inyoplanning.org/plans_laws.htm

Los Angeles County:

Safety Element.
http://planning.lacounty.gov/assets/upl/project/gp_web90-safety-element.pdf

Los Angeles County, California – Code of Ordinances; see Title 26 – Building Code sections 111 – Engineering Geology and Soils Engineering Reports, 112 – Earthquake Fault Maps, 113 – Earthquake Faults.
https://library.municode.com/CA/los_angeles_county/codes/code_of_ordinances?nodeId=TIT26BUCO_CH1AD_S111ENGESOENRE

County of Los Angeles Department of Public Works, Manual for Preparation of Geotechnical Reports.
http://dpw.lacounty.gov/gmed/permits/docs/manual.pdf

Marin County:

Marin Countywide Plan; see Chapter 2 – The Natural Systems and Agriculture Element, section 2.6 – Environmental Hazards (EH).
https://www.marincounty.org/~/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update.pdf

Mendocino County:

Health and Safety; see 8-13 – Mendocino County 2008-2010 Phase I Strategic Plan.
https://www.mendocinocounty.org/home/showdocument?id=11881

Merced County:

Health and Safety Element.
http://web2.co.merced.ca.us/pdfs/planning/generalplan/DraftGP/MCGPU_2030/MCGPU_2030GP_Part_II-10_HEALTH_SAFETY_PRD_2012-11-30.pdf

Mono County:

Safety Element, see II. Issues/Opportunities/Constraints – Seismic Hazards.
https://www.monocounty.ca.gov/sites/default/files/fileattachments/planning_division/page/9617/safety_element_final_12.08.15.pdf

Monterey County:

Safety Element.
http://www.co.monterey.ca.us/home/showdocument?id=45806

2007 General Plan DEIR, Geology, Soils, and Seismicity; see 4.4.3.2 State Regulations.
http://www.co.monterey.ca.us/home/showdocument?id=43992

Napa County:

Napa County General Plan; see Safety Element.
http://www.countyofnapa.org/GeneralPlan/

Napa County, California – Code of Ordinances, see Title 15 – Buildings and Construction section 15.08.050 Building Permit-Geologic Hazard report.
https://library.municode.com/ca/napa_county/codes/code_of_ordinances?nodeId=TIT15BUCO_CH15.08BUEXPE

Riverside County:

Safety Element, see S-7 Hazard Specific Issues and Policies.
http://planning.rctlma.org/Portals/0/genplan/general_Plan_2017/elements/OCT17/Ch06_Safety_DEC2016.pdf?ver=2017-10-06-093651-757

Ordinance of the County of Riverside; AP Earthquake Fault Zoning Act.
http://www.rivcocob.org/ords/500/547.7.pdf

San Diego County:

Safety Element, see 7-11 – Geological Hazards.
http://www.sandiegocounty.gov/pds/gpupdate/docs/BOS_Aug2011/C.1-6_Safety.pdf

Geologic Hazards Guidelines for Determining Significance; see 2.0 Existing Regulations and Standards and 4.0 Guidelines for Determining Significance.
http://www.sandiegocounty.gov/dplu/docs/Geologic_Hazards_Guidelines.pdf

San Benito County:

Seismic Safety/Safety Elements.
http://cosb.us/wp-content/uploads/SBC-ExistingGP-Seismic.pdf

2035 General Plan Update 2015 Revised DEIR, Geology, Soils, and Mineral Resources; see 10.1.2 Regulatory Setting.
http://cosb.us/wp-content/uploads/10-Geology-Soils-Mineral-Resources.pdf

Santa Clara County:

Santa Clara County General Plan; see Part 2: Countywide Issues and Policies, I-7 – Safety and Noise Chapter.
https://www.sccgov.org/sites/dpd/DocsForms/Documents/GP_Book_A.pdf

Santa Clara County, California – Code of Ordinances; see Title C – Construction, Development, and Land Use, Division C12 – Subdivisions and Land Development, Chapter IV. Geologic Provisions Article 2 – County Geologic Hazard Zones.
https://library.municode.com/ca/santa_clara_county/codes/code_of_ordinances?nodeId=TITCCODELAUS_DIVC12SULADE_CHIVGEPR_ART2COGEHAZO

Santa Cruz County:

Santa Cruz County General Plan; Chapter 6: Public Safety and Noise, see Page 6-3 – Seismic Hazards.
http://www.sccoplanning.com/Portals/2/County/Planning/policy/1994GeneralPlan/chapter6.pdf?ver=2011-03-02-000000-000

Santa Cruz County Geologic Hazards; see 16.10.050 – Requirements for Geologic Assessment and 16.10.105 – Notice of Geologic Hazards in Cases of Dangerous Conditions.
http://www.codepublishing.com/CA/SantaCruzCounty/html/SantaCruzCounty16/SantaCruzCounty1610.html

Shasta County:

General Plan, Public Safety Group, Seismic and Geologic Hazards.
https://www.co.shasta.ca.us/docs/libraries/resource-management-docs/docs/51seismic.pdf?sfvrsn=0

San Luis Obispo County:

San Luis Obispo County General Plan, Safety Element; see Chapter 5 page 17 – Geologic and Seismic Hazards.
http://www.slocounty.ca.gov/getattachment/893b6c58-7550-4113-911c-3ef46d22b7c8/Safety-Element.aspx

San Luis Obispo County Code, Title 22 – Land Use Ordinance, Article 3 – Site Planning and Project Design Standards, Chapter 22.14 – Combining Designation Standards, 22.14.070 – Geologic Study Areas.
https://library.municode.com/ca/san_luis_obispo_county/codes/county_code?nodeId=TIT22LAUSOR_ART3SIPLPRDEST_CH22.14CODEST_22.14.070GESTARGS

San Luis Obispo County Code, Title 23 – Coastal Land Use, Chapter 23.07 – Combining Designation Standards, 23.07.080 – Geologic Study Areas.

https://library.municode.com/ca/san_luis_obispo_county/codes/county_code?nodeId=TIT23COZOLAUS_CH23.07CODEST_23.07.080GESTARGS

San Luis Obispo County Code, Title 23 – Coastal Land Use, Chapter 23.07 – Combining Designation Standards, 23.07.084 – Application Content – Geologic and Soils Report.
https://library.municode.com/ca/san_luis_obispo_county/codes/county_code?nodeId=TIT23COZOLAUS_CH23.07CODEST_23.07.084APCOEOSORERE

San Luis Obispo County Code, Title 23 – Coastal Land Use, Chapter 23.07 – Combining Designation Standards, 23.07.086 – Geologic Study Area Special Standards.
https://library.municode.com/ca/san_luis_obispo_county/codes/county_code?nodeId=TIT23COZOLAUS_CH23.07CODEST_23.07.086GESTARSPST

County Guidelines for Engineering Geology Reports.
http://www.slocounty.ca.gov/getattachment/f58bc2f2-cb40-45b8-8fb8-f19fc804ffec/Guidelines-for-Engineering-Geology-Reports.aspx

Ventura County:

Ventura County General Plan Goals, Policies and Programs; see Chapter 2 on Hazards, Page 29.
http://venturawatershed.org/wp-content/uploads/2015/04/VCPD_Gen_Plan_2013.pdf

California Cities

City of Walnut Creek:

General Plan, Chapter 6 Safety and Noise.
http://www.walnut-creek.org/home/showdocument?id=5010

Municipal Code, Title 9 Building Regulations, Chapter 9 Site Development; 9-9.06 Soils and Engineering Geology Report, c.6.
http://www.codepublishing.com/CA/WalnutCreek/#!/WalnutCreek09/WalnutCreek0909.html

Municipal Code, Title 10 Planning and Zoning, Chapter 1 Subdivisions; 10-1.702 Requirements and Procedures, 2.c.
http://www.codepublishing.com/CA/WalnutCreek/#!/WalnutCreek10/WalnutCreek1001.html

Municipal Code, Title 10 Planning and Zoning, Chapter 2 Zoning; 10-2.3.402 Definitions, D. High Risk Area; 10-2.3.407 Property Development Standards, G. Creek, Landslide, and Fault-Line Setbacks.
http://www.codepublishing.com/CA/WalnutCreek/#!/WalnutCreek10/WalnutCreek1002C.html

City of Los Angeles:

General Plan, Safety Element.
https://planning.lacity.org/cwd/gnlpln/saftyelt.pdf

City of Los Angeles Preliminary Fault Rupture Study Areas.
http://geohub.lacity.org/datasets/9a1a1c350c9043a2b2fce10c0530f769_2?geometry=-118.819%2C33.731%2C-117.717%2C33.902

Information Bulletin / Public – Building Code, Surface Fault Rupture Hazard Investigations.
https://www.ladbs.org/docs/default-source/publications/information-bulletins/building-code/ib-p-bc2014-129surfacefaultrupturehazardinvestigations.pdf?sfvrsn=13

Information Bulletin / Public – Building Code, Exemptions from Liquefaction, Earthquake Induced Landslide, and Fault-Rupture Hazard Zone Investigations.
http://www.ladbs.org/docs/default-source/publications/information-bulletins/building-code/exemptions-from-liquefaction-earthquake-induced-landslide-and-faullt-rupture-hazard-zone-investigations-ib-p-bc2014-044.pdf?sfvrsn=19

City of Los Angeles Municipal Code, Chapter IX Building Regulations, Article 1 Buildings (Building Code); 91.106.4. Permits Issuance, Exceptions, 4.
http://library.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:la_all_mc

City of Los Angeles Municipal Code, Chapter I General Provisions and Zoning, Article 3 Specific Plan – Zoning Supplemental Use Districts; Section 13.04. “RPD” Residential Planned Development Districts, C. Requirements for Filing, 3. Preliminary Geological and Soils Engineering Reports.
http://library.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:la_all_mc

City of Santa Monica:

Guidelines for Geotechnical Reports; 3.3.1 Fault Rupture Hazards, page 21.
https://www.smgov.net/uploadedFiles/Departments/PCD/Permits/Guidelines-for-Geotechnical-Reports.pdf

City of San Diego:

General Plan, Public Facilities, services and Safety Element; Q. Seismic Safety, PF -66.
https://www.sandiego.gov/sites/default/files/pf_2015.pdf

San Diego Municipal Code, Chapter 14: General Regulations, Article 5: Building Regulations, §145.1803 Local Additions and Modifications to Section 1803 “Geotechnical

Investigations" of the California Building Code.
http://docs.sandiego.gov/municode/MuniCodeChapter14/Ch14Art05Division18.pdf

City of San Diego Guidelines for Geotechnical Reports.
https://www.sandiego.gov/sites/default/files/legacy/development-services/pdf/industry/geoguidelines.pdf

City of Rancho Cucamonga:

General Plan Chapter 8: Public Health and Safety; Seismic Hazards, page PS-12. Goal PS-6: Minimize the potential damage to structures and loss of life that may result from earthquakes and other seismic hazards, page PS-53.
https://www.cityofrc.us/civicax/filebank/blobdload.aspx?BlobID=6819

Rancho Cucamonga Municipal Code, **Title 16 Subdivisions**, Chapter 16.16 Tentative Maps – Five or more Parcels, 16.16.030 Accompanying data and Reports, C. Engineering Geology and/or Seismic Safety Report. Chapter 16.20, Tentative Parcel Maps – Four or Less Parcels, 16.20.030 Contents, T. Engineering Geology and/or Seismic Safety Report. **Title 17 Development Code**, Article VII. Design Standards and Guidelines, Chapter 17.122 Design Provisions by Development Type, 17.122.020 Hillside Development, K. Public Safety, 1.i.
http://qcode.us/codes/ranchocucamonga/

Town of Woodside:

General Plan, Natural Hazards and Safety Element.
https://www.woodsidetown.org/sites/default/files/fileattachments/5_natural_hazards_and_safety_element_4.pdf

General Plan 2012 Maps.
https://www.woodsidetown.org/planning/general-plan-2012-maps-0

Municipal Code, § 153.153 Seismic Safety.
https://www.woodsidetown.org/municipalcode/%C2%A7-153153-seismic-safety

Municipal Code, § 153.301 Limitations Applicable to Alterations, Additions, Replacement, or Paved Area and Surface Coverage.
https://www.woodsidetown.org/municipalcode/%C2%A7-153301-limitations-applicable-alterations-additions-replacement-or-paved-area-and-su

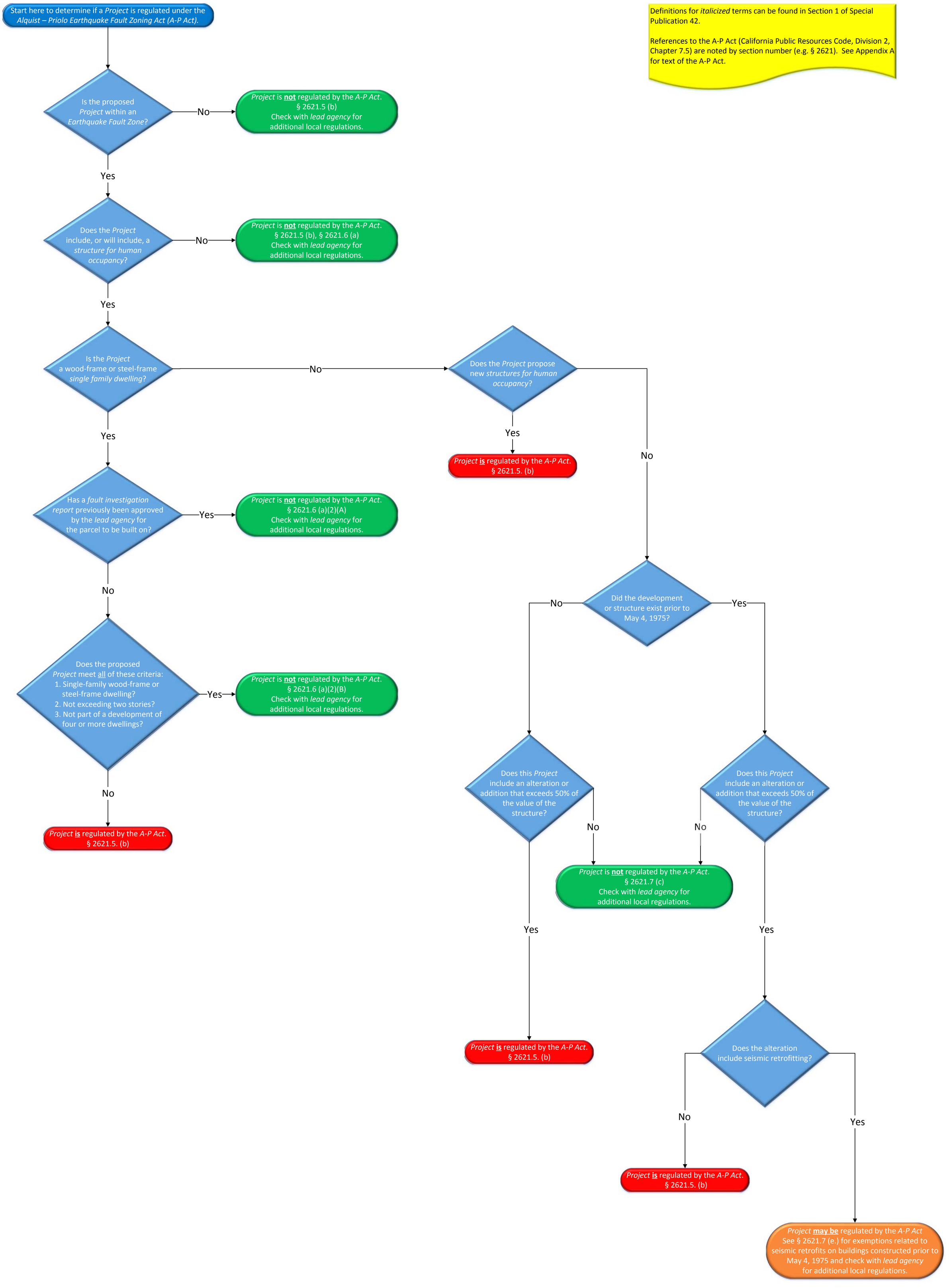
Municipal Code, § 151.20 Permits Required.
https://www.woodsidetown.org/municipalcode/%C2%A7-15120-permits-required

Geotechnical / Soils Report Requirements Matrix.
https://www.woodsidetown.org/building/geotechnicalsoils-report-requirements-matrix

Please note:

Plates 1 and 2 are oversized plates that should be printed out at full size using a large scale plotter, or be viewed electronically using the zoom tools available in Adobe Acrobat.

IS MY PROJECT REGULATED BY THE ALQUIST – PRIOLO EARTHQUAKE FAULT ZONING ACT?



Definitions for *italicized* terms can be found in Section 1 of Special Publication 42.

References to the A-P Act (California Public Resources Code, Division 2, Chapter 7.5) are noted by section number (e.g. § 2621). See Appendix A for text of the A-P Act.

Does a *fault investigation report* meet the minimum requirements of the *Alquist – Priolo Earthquake Fault Zoning Act (A-P Act)* in order to be approved by the *lead agency?*

Definitions for *italicized* terms can be found in Section 1 of Special Publication 42.

Is the *fault investigation report* prepared by a *Professional Geologist* (licensed in the State of California)

No → *Fault investigation report* does not comply with the requirements of the *A-P Act.*

Yes

Is the *fault investigation* "...designed to identify the location, recency, and nature of faulting that may have affected the *project* site in the past and may affect the *project* site in the future."? (CCR Title 14, Division 2, 3603 (d))

No → *Fault investigation report* does not comply with the requirements of the *A-P Act.*

Yes

Does the *fault investigation report* make recommendations to ensure that no *structure for human occupancy* shall be permitted to be placed across the trace of a *Holocene-active fault*?

No → *Fault investigation report* does not comply with the requirements of the *A-P Act.*

Yes

Has the *fault investigation report:*
1.) Been reviewed by a *Professional Geologist (i.e. reviewing geologist)* representing the *lead agency*
and
2.) Has the reviewing geologist advised the *lead agency* that the *fault investigation report* addresses the potential for *surface fault rupture* at the *project* site?

No → *Lead agency* must complete items 1 & 2 to comply with the requirements of the *A-P Act.*

Review comments from *reviewing geologist* should be addressed by *project geologist* before *fault investigation report* is approved by *lead agency.*

Yes

Fault investigation report complies with the minimum standards required by the *A-P Act*

California Geological Survey - Note 48

Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings

November 2022

Note 48 is used by the California Geological Survey (CGS) to review the geology, seismology, and geologic hazards evaluated in reports that are prepared under California Code of Regulations (CCR), Title 24, California Building Code (2022 CBC). CCR Title 24 applies to California Public Schools, Hospitals, Skilled Nursing Facilities, and Essential Services Buildings. The Building Official for public schools is the Division of the State Architect (DSA). Hospitals and Skilled Nursing Facilities in California are under the jurisdiction of the Department of Health Care Access and Information (HCAI). The California Geological Survey serves as an advisor under contract with these two state agencies.

Project Name: _____ Location: _____

HCAI or DSA File #: _____ Reviewed By: _____

Date Reviewed: _____ California Certified Engineering Geologist #: _____

Checklist Item or Topic Within Consulting Report NA = not applicable NR = not addressed by consultant and therefore not reviewed at this time	Adequately Described; Satisfactory	Additional Information Needed
Project Location		
1. Site Location Map, Street Address, County Name: Plot site on a USGS topographic base-map.		
2. Plot Plan with Exploration Data and Building Footprint: Show locations of borings, CPTs, trenches or other explorations.		
3. Site Coordinates: Latitude and Longitude.		
Engineering Geology/Site Characterization		
4. Regional Geology and Regional Fault Maps: Concise page-sized illustrations with site plotted.		
5. Geologic Map of Site: Detailed (large-scale) geologic map with proper symbols and geologic legend.		
6. Geologic Hazard Zones: *(If applicable)* Discuss proposed structures in relation to CGS official map showing Zones of Required Investigation for any seismic hazards (liquefaction, landslide, tsunami, fault rupture) and/or any pertinent geologic hazard map from the Safety Element of the local agency (city/county).		
7. Subsurface Geology: Adequate subsurface exploration: One boring or exploration shaft per 5000 ft^2, with minimum of two for any one building (CBC §1803A.3.1). Borings of adequate depth to characterize hazards and geotechnical properties. CPTs with correlated borings (upload data files). Engineering geologic description summarized from boreholes or trench logs. Summarize ground water conditions.		
8. Geologic Cross Sections: Two or more interpretive geologic sections, based on site exploration data, with pertinent foundations and site grading. Depict extent of liquefiable soils.		
9. Geotechnical Testing of Representative Samples: Broad suite of appropriate geotechnical tests		
10. Consideration of Geology in Geotechnical Engineering Recommendations: Discuss engineering geologic aspects of excavation/grading/fill activities, foundations and support of structures. Include geologic and geotechnical inspections and problems anticipated during grading. Provide all information as required by CBC §1803A.7, including special design and construction provisions for settlement and bearing capacity failure of foundations bearing on weak/soft, collapsible, liquefiable, or expansive soils. Consideration of seismic compression of fills; and cut/fill differential settlement.		
11. Conditional Geotechnical Topics: (*If applicable*) Including but not limited to – **A. Basement and retaining wall design** – demonstrate conformance with CBC §1807A.2 and §1803A.5.12. **B. Deep foundations** – demonstrate conformance with CBC §1803A.5.5, §1803A.5.12, §1810A, and ASCE 7 §12.13. **C. Effects of construction on adjacent structures**, including temporary shoring/underpinning. Attach software documentation.		
Seismology and Calculation of Earthquake Ground Motion		
12. Evaluation of Historical Seismicity: Describe briefly how historical earthquakes have affected site.		
13. Classify the Geologic Subgrade (Site Class): ASCE 7, Chapter 20. Provide justification.		
14. General Procedure Ground Motion Analysis: Follows CBC §1613A.2. Report parameters S_S, S_1, S_{DS}, S_{D1}, and T_S. Tools available at: https://earthquake.usgs.gov/hazards/designmaps/.		
15. Site-Specific Ground Motion Procedures: (*Assumed to be required for Site Class D and E unless an Exception in ASCE 7, Supplement No. 3 is invoked.*) Required in ASCE 7, §11.4.8. See requirements in §21.2 to §21.5 *and* Supplement No. 1 and 3, and in CBC §1803A.6. CGS suggests a table showing: **(a)** 2%-in-50-years probabilistic spectrum, **(b)** risk coefficients, **(c)** probabilistic MCE_R, **(d)** 84th percentile deterministic spectrum, *if allowed,* **(e)** *scaled* deterministic spectrum, (§21.2.2), **(f)** site-specific MCE_R (§21.2.3), **(g)** 80% of *modified* General Response Spectrum (§21.3), **(h)** design response spectrum (§21.3). Also provide S_{DS} and S_{D1} values per ASCE 7 §21.4. Attach software documentation. *For Site Class F – see §21.1, and §21.3 to §21.5.*		
16. Deaggregated Seismic Source Parameters: (*If applicable*) If needed for liquefaction or slope stability analysis, or for earthquake record selection, provide *controlling* magnitude (M) and fault distance (R). Might be either deterministic or deaggregate for modal M and R.		

Checklist Item or Topic Within Consulting Report NA = not applicable NR = not addressed by consultant and therefore not reviewed at this time	Adequately Described; Satisfactory	Additional Information Needed
17. Time Histories of Earthquake Ground Motion: (*If applicable*) Develop target spectra (MCE_R or conditional mean). Justify selected earthquake records. Scale or spectral match to meet ASCE 7 §12.9.2 or §16.2 for linear or non-linear response history analysis, respectively. Show initial and scaled time histories and response spectra.		

Fault Rupture Hazard Evaluation

18. Active Faulting and Coseismic Deformation Across Site: Discuss active faults at the site or projecting toward it. Address location of faults and their activity level. See CGS Special Publication 42. Show location of proposed structures in relation to any potential fault rupture hazard; show location of fault investigation trenches, and recommended setbacks from fault trace (minimum 50-feet).		

Liquefaction/Seismic Settlement Analysis

19. Geologic Setting for Occurrence of Liquefaction: Perform *screening* analysis to identify where the following conditions apply: (1) depth of highest historical ground water surface <50 ft, and (2) low-density, non-plastic and low plasticity alluvium, typically with $SPT\ (N_1)_{60}$<30		
20. Seismic Settlement Calculations: (*If applicable*) Evaluate both saturated and unsaturated layers of the entire soil column. Provide calculations (no estimates) and report all input parameters. Evaluate liquefaction triggering using highest historical ground water elevation and PGA_M (CBC §1803A.5.12) and calculate liquefaction settlement for each layer where FS<1.3 (CGS SP117A). *Seismic differential settlement* (ASCE 7-16, §12.13.9) should be determined from multiple borings defining the full liquefiable interval and located to adequately define lateral variability. If fewer deep borings are available, then assume half of total settlement across a horizontal distance of 30 feet. Report results in terms that include horizontal dimension. Attach software documentation.		
21. Other Liquefaction Effects: (*If applicable*) Bearing capacity failure (ASCE 7, §12.13.9.1), surface manifestation (i.e., sand boils), and/or lateral spread (refer to CGS SP117A).		
22. Mitigation Options for Liquefaction/Seismic Settlement: (*If applicable*) Discuss effectiveness of options to mitigate liquefaction effects. Where liquefiable soils are identified, see ASCE 7, §12.13.9, for foundation design. If ground improvement is proposed, discuss performance objectives, provide measurable acceptance criteria, and recommend field verification program.		

Slope Stability Analysis

23. Geologic Setting for Occurrence of Landslides: Characterize the potential for landsliding both on and off-site affecting proposed project.		
24. Determination of Static and Dynamic Strength Parameters: (*If applicable*) Conduct appropriate laboratory tests to determine material strength for both static and dynamic conditions.		
25. Determination of Pseudo-Static Coefficient (K_{eq}): (*If applicable*) Recommended procedure available from CGS Special Publication 117A. Recommend using design-level ground motion based on geometric mean and without risk coefficient (*i.e.*, $(PGA_M)/1.5$), or discuss with CGS.		
26. Identify Critical Slip Surfaces for Static and Dynamic Analyses: (*If applicable*) Failure surfaces should be modeled to include existing slip surfaces, discontinuities, geologic structure and stratigraphy; include appropriate ground water conditions. Attach software documentation.		
27. Dynamic Site Conditions: (*If applicable*) Site response analysis and topographic effects should be considered, if appropriate.		
28. Mitigation Options for Landsliding/Other Slope Failure: (*If applicable*) Discuss effectiveness of options to mitigate landsliding/slope failure effects. Acceptance criteria for ground-improvement schemes.		

Other Geologic Hazards or Adverse Site Conditions

These exceptional geologic hazards do not occur statewide; however, they may be pertinent to a particular site. Where these conditions exist, relevant information should be communicated to the design team.

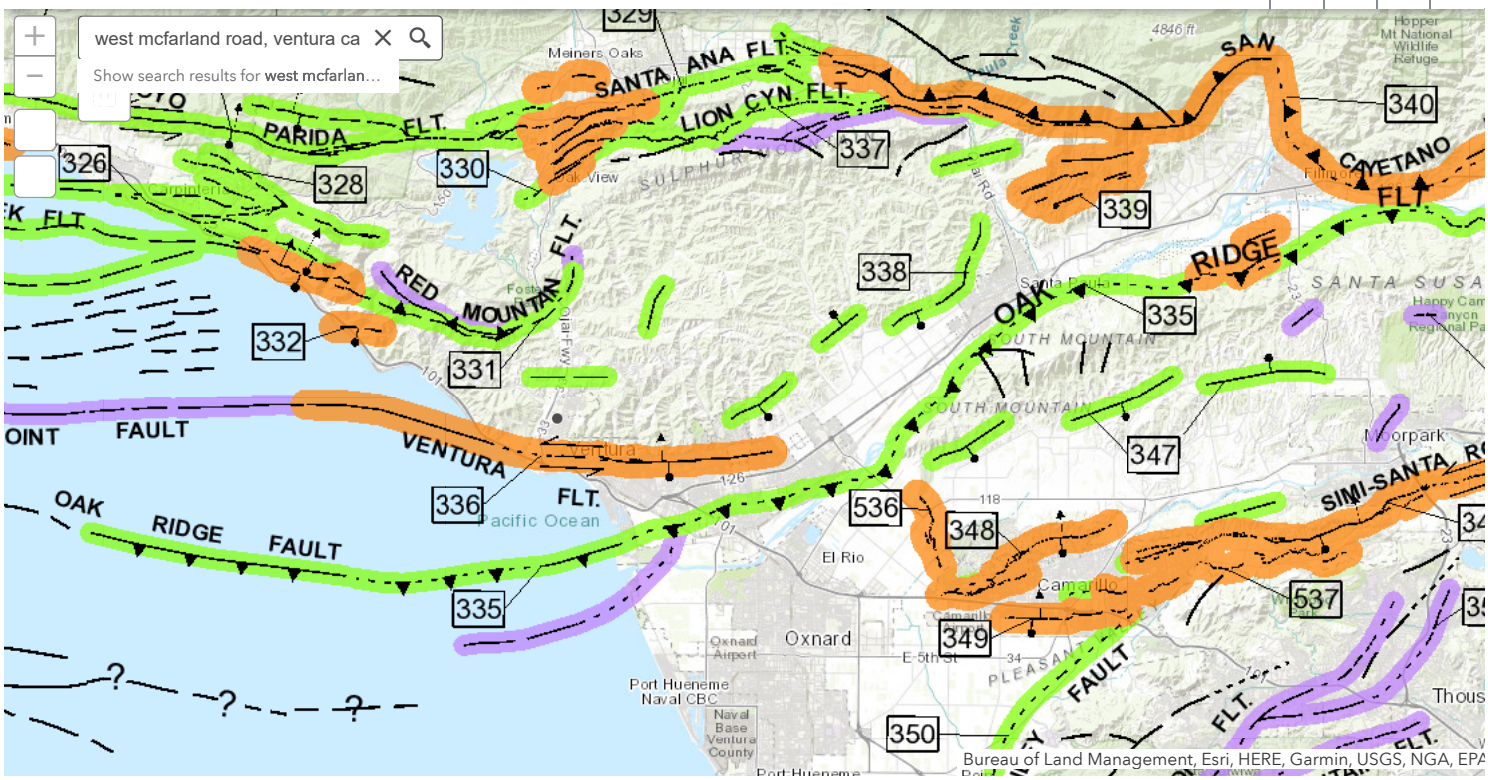
29. Expansive Soils		
30. Corrosive/Reactive Geochemistry of Geologic Subgrade: soluble sulfates and corrosive soils.		
31. Conditional Geologic Assessment: Including but not limited to - **A. Hazardous materials** methane gas, hydrogen-sulfide gas, tar seeps; **B. Volcanic eruption**; **C. Flooding** Riverine (FEMA FIRMs or local zoning for 100-year flood); see CBC §1612A. Also consider alluvial fan flooding and dam inundation. Is the site elevated or protected from the hazard; **D. Tsunami and seiche inundation**; see ASCE 7, Chapter 6; zone maps at web site ASCE7tsunami.online; **E. Radon-222 gas**; **F. Naturally occurring asbestos** in geologic formations associated with serpentine; refer to CGS SP 124; **G. Hydrocollapse** of alluvial fan soils due to anthropic use of water; **H. Regional subsidence**; **I. Clays and cyclic softening**.		

Report Documentation

32. Geology, Seismology, and Geotechnical References		
33. Certified Engineering Geologist: (CBC §1803A)		
34. Registered Geotechnical Engineer: (CBC §1803A)		

Fault Activity Map of California

California Geological Survey



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CRITICAL INFRASTRUCTURE SECTORS

There are 16 critical infrastructure sectors whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof. Presidential Policy Directive 21 (PPD-21): Critical Infrastructure Security and Resilience advances a national policy to strengthen and maintain secure, functioning, and resilient critical infrastructure. This directive supersedes Homeland Security Presidential Directive 7.

Guidance on the Essential Critical Infrastructure Workforce

Chemical Sector

The Department of Homeland Security is designated as the Sector Risk Management Agency for the Chemical Sector.

Commercial Facilities Sector

The Department of Homeland Security is designated as the Sector Risk Management Agency for the Commercial Facilities Sector, which includes a diverse range of sites that draw large crowds of people for shopping, business, entertainment, or lodging.

Communications Sector

The Communications Sector is an integral component of the U.S. economy, underlying the operations of all businesses, public safety organizations, and government. The Department of Homeland Security is the Sector Risk Management Agency for the Communications Sector.

Critical Manufacturing Sector

The Department of Homeland Security is designated as the Sector Risk Management Agency for the Critical Manufacturing Sector.

Dams Sector

The Department of Homeland Security is designated as the Sector Risk Management Agency for the Dams Sector. The Dams Sector comprises dam projects, navigation locks, levees, hurricane barriers, mine tailings impoundments, and other similar water retention and/or control facilities.

Defense Industrial Base Sector

The U.S. Department of Defense is the Sector Risk Management Agency for the Defense Industrial Base Sector. The Defense Industrial Base Sector enables research, development, design, production, delivery, and maintenance of military weapons systems, subsystems, and components or parts to meet U.S. military requirements.

Emergency Services Sector

The Department of Homeland Security is designated as the Sector Risk Management Agency for the Emergency Services Sector. The sector provides a wide range of prevention, preparedness, response, and recovery services during both day-to-day operations and incident response.

Energy Sector

The U.S. energy infrastructure fuels the economy of the 21st century. The Department of Energy is the Sector Risk Management Agency for the Energy Sector.

Financial Services Sector

The Department of the Treasury is designated as the Sector Risk Management Agency for the Financial Services Sector.

Food and Agriculture Sector

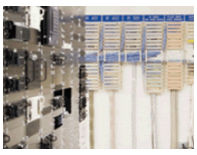
The Department of Agriculture and the Department of Health and Human Services are designated as the co-Sector-Risk Management Agencies for the Food and Agriculture Sector.

Government Facilities Sector

The Department of Homeland Security and the General Services Administration are designated as the Co-Sector Risk Management Agencies for the Government Facilities Sector.

Healthcare and Public Health Sector

The Department of Health and Human Services is designated as the Sector Risk Management Agency for the Healthcare and Public Health Sector.



Information Technology Sector

The Department of Homeland Security is designated as the Sector Risk Management Agency for the Information Technology Sector.

Nuclear Reactors, Materials, and Waste Sector

The Department of Homeland Security is designated as the Sector Risk Management Agency for the Nuclear Reactors, Materials, and Waste Sector.

Transportation Systems Sector

The Department of Homeland Security and the Department of Transportation are designated as the Co-Sector-Specific Agencies for the Transportation Systems Sector.

Water and Wastewater Systems Sector

The Environmental Protection Agency is designated as the Sector Risk Management Agency for the Water and Wastewater Systems Sector.

Last Updated Date: October 21, 2020

WE THE PEOPLE

of Ventura, in order to ensure that our City continues to be a great place for us to live . . .

ACHIEVING THE VISION

2005 ventura general plan

CITY OF SAN BUENAVENTURA

2005 VENTURA GENERAL PLAN

ADOPTED AUGUST 8, 2005

RESOLUTION NOS.2005-072 AND 2005-073

The following people contributed to the preparation of the 2005 Ventura General Plan:

CITY COUNCIL
Brian Brennan, Mayor
Carl E. Morehouse, Deputy Mayor
Neal Andrews, Council Member
Bill Fulton, Council Member
James L. Monahan, Council Member
Sandy E. Smith, Council Member
Christy Weir, Council Member

PLANNING COMMISSION
Carolyn Briggs, Chair
Curt Stiles, Vice Chair
Ronald Allen, Commissioner
Michael Faulconer, Commissioner
Martel Fraser, Commissioner
Bill Growdon, Commissioner
John Hecht, Commissioner

GENERAL PLAN COMMITTEE
Carolyn Briggs, Planning Commission Chair
Michael Faulconer, Commissioner
Bill Fulton, Council Member
John Hecht, Commissioner
Sandy E. Smith, Council Member
Christy Weir, Council Member

VENTURA VISION SEIZE THE FUTURE STEERING COMMITTEE
Sandy Smith
Brian Brennan
Lauri Flack
Bill Fulton
Lynn Jacobs
James Monahan
Ted Temple

COMPREHENSIVE PLAN ADVISORY COMMITTEE
Dan Long, Chair
Rob Corley, Vice Chair
Darlene Benz
Bart Bleuel
Don Bowles
Holly Breiner
Carolyn Briggs
Dan Cormode
Tim Dagodag
Karen Flock
Fred Gientke
Rondi Guthrie
Jorge Gutierrez
Margaret Merryman
Carl E. Morehouse
Kioren Moss
Jaime Santana
Bob Tobias
Dan Wolnick

SEIZE THE FUTURE CITIZENS OUTREACH COMMITTEE (Ventura Vision – 2000)

Bill Fulton, Chair
Roma Armbrust, At-large
John Ashkar, Building Industry Association
Michael Carney, Utilities
Geoff Cline, Patagonia/Large employer
Mary Cook, At-large
Curtis Cormane, Midtown Community Council
John Correa, At-large
Jerry Dannenberg, Ventura Unified School District
Jim DaPra, Small employer
Mike Del Dosso, Westside Community Council
Kenneth R. Edwardsen, At-large
Kay Faulconer, Ventura Community College District
Darlene Fuller, South Coast Area Transit
Debbie Giles, At-large
Jannes Gofourth, Red Land Clearing, Small employer
Doug Halter, Downtown Community Council
Gary Jacobs, Ventura Port District
John S. Jones, At-large
Joe Kreutz, Banking
Leslie Leavens-Crowe, Cultural Affairs Commission
Greg Lowe, Kinkos/Large employer
Lanette McCaslin, Pierpont Community Council
Carl Morehouse, American Planning Association
Glen Morris, Public Art Commission
Paul E. Newman, Parks & Recreation Commission
Clark Owens, At-large
Michael Paluszak, Seaside Park/Ventura County Fairgrounds
Marcia Rhodes, Tourism Commission
Marty Robinson, County of Ventura
Betty Sherman, League of Women Voters
Chris Stephens, Ventura County Transportation Commission
Neal K. Subic, American Institute of Architects
Zoe Taylor, Greater Ventura Chamber of Commerce
Paul Thompson, East Ventura Community Council
Stephen B. Thompson, American Society of Civic Engineers
George Tillquist, Library Commission
Bob Tobias, Agriculture
Eric Werbalowsky, Environmental Organizations

CITY STAFF
Rick Cole, City Manager
Mary Walsh, Deputy City Manager
Bob Boehm, City Attorney
Susan J. Daluddung, Community Development Director

Lead Staff
Ann B. Daigle, Urban Development Manager
Kari Gialketsis, Principal Planner
Jim Neuerburg, Assistant City Attorney II
Lisa Y. Porras, AICP, Senior Planner, Project Manager
Eric W. Lentz, Associate Planner
V.S. Chandrashaker, Associate Transportation Engineer

TECHNICAL CONSULTANTS
TO THE CITY -
Lead Consultants

Crawford Multari and Clark Associates
Paul Crawford, Prinicipal
Charlie Knox, Senior Associate
Lisa Wise, Associate

Rincon Consultants, Inc.
Stephen Svete, AICP, President
Joseph Power, AICP, Principal

TECHNICAL CONSULTANTS
TO THE CITY -
Supporting Consultants
Austin Foust Associates
Terry Austin

Cotton/Bridges/Associates - A Division of P&D Consultants
Karen Warner

Moore Iacofano Goltsman, Inc.
Sam Gennawey
Steve Reiner

Moule & Polyzoides
Stefanos Polyzoides
Bill Dennis

PSOMAS
Mike Swan

Stanley R. Hoffman Associates
Stan Hoffman

CITY STAFF

Supporting Staff

Houshang Abbassi, Deputy Building Official
Roger Adams, GIS, Systems Analyst II
Alvin Adora, Mail/Print Shop Aide
Lisette Alivandivafa, Office Services Supervisor
Dave Armstrong, Downtown Project Manager
Kyle Ashby, Website Specialist
Dori Boyer, Secretary
Joey Briglio, Assistant Planner
Elena Brokaw, Community Services Director
Martin Brown, Senior Inspector
Peter Brown, Community Services Manager
Shelly Brown, Executive Assistant
Jennie Buckingham, CDBG Associate Planner
Ron Calkins, Public Works Director
Kevin Colin, Interim Senior Planner
Judy Devine, Community Services Manager
Annett Ewing, Senior Office Assistant
Quinn Fenwick, Lieutenant, Police
Roxanne Fiorillo, Assistant City Clerk
Kelly Flanders, Senior Office Assistant
Robert Garven, Print Services Leadworker
Greg Gilmer, Golf Services Manager
Cary Glenn, Public Services Assistant
Bill Hatcher, Housing, Senior Planner
Brian Haworth, Associate Planner
Suzanne Hense, Word Processing
Alex Herrera, Senior Planner
Priscilla Holmes, Graphics
Iain Holt, Associate Planner
Margaret A. Ide, Associate Planner
Luz Juachon, Secretary
Mike Lavery, Fire Chief
Veronica Ledesma, Junior Planner
Tom Mericle, Transportation and Traffic Engineer
Pat Miller, Police Chief
Kaye Mirabelli, Administrative Services Director
Mike Montoya, Parks Manager
Frank Nelson, Civic Engineer
Richard Newsham, Marketing Specialist
Kelly Nicely, Marketing Specialist
Jim Passanisi, Water Superintendent
Stratis Perros, Interim Senior Planner
Mabi Plisky, City Clerk
Ventura Police Department
Andrew Powers, Marketing Specialist
Elaine Preston, Deputy City Clerk
Teresa Purrington, Management Technician
Rick Raives, City Engineer
Brian Randall, Associate Planner
Robert Sanchez, Secretary
Andrew Stuffler, Building Official/Fire Marshall
Anne Simmons, Administrative Secretary
Alison Sweet, Associate Civic Engineer
Don Taylor, GIS, Systems Analyst I
Sue Torres, Administrative Secretary
Yvonne Velasco, Printer II
Jenise Wagar, Civic Engagement Manager
Roger Wang, Management Analyst I
Debby Welch, Senior Office Assistant
Sid White, Economic Development Manager
Bob Williams, Principal Civil Engineer
Pat Womack, IT/Word Processing
Felix Yzaguirre, Engineering Technician

…and to the countless citizens who gave their time and energy towards the making of this plan.

This plan is dedicated to the citizens of Ventura.

August 8, 2005

In loving memory of Roma Armbrust and
Dennis R. Mackay

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ventura's general plan

OVERVIEW

"The building of cities is one of man's greatest achievements. The form of his city always has been and always will be a pitiless indicator of the state of his civilization. This form is determined by the multiplicity of decisions made by the people who live in it."

— Edmund N. Bacon
Design of Cities, 1967

CITY OF
VENTURA

We, the people of Ventura, in order to ensure that our City remains a great place for us to live ...

. . . establish these goals for our community's future:

OUR NATURAL COMMUNITY

Our goal is to be a model for other communities of environmental responsibility, living in balance with our natural setting of coastline, rivers, and hillside ecosystems.

OUR PROSPEROUS COMMUNITY

Our goal is to attract and retain enterprises that provide high-value, high wage jobs; to diversity the local economy; to increase the local tax base; and to anticipate our economic future in order to strengthen our economy and help fund vital public services.

OUR WELL-PLANNED COMMUNITY

Our goal is to protect our hillsides, farmlands, and open spaces; enhance Ventura's historic and cultural resources; respect our diverse neighborhoods; reinvest in older areas of our community; and make great places by insisting on the highest standards of quality in architecture, landscaping and urban design.

OUR ACCESSIBLE COMMUNITY

Our goal is to provide residents with more transportation choices by strengthening and balancing bicycle, pedestrian and transit connections in the City and surrounding region.

OUR SUSTAINABLE INFRASTRUCTURE

Our goal is to safeguard public health, well being and prosperity by providing and maintaining facilities that enable the community to live in balance with natural systems.

OUR ACTIVE COMMUNITY

Our goal is to add to and enhance our parks and open spaces to provide enriching recreation options for the entire community.

OUR HEALTHY AND SAFE COMMUNITY

Our goal is to build effective community partnerships that protect and improve the social well being and security of all our citizens.

OUR EDUCATED COMMUNITY

Our goal is to encourage academic excellence and life-long learning resources to promote a highly-educated citizenry.

OUR CREATIVE COMMUNITY

Our goal is to become a vibrant cultural center by weaving the arts and local heritage into everyday life.

OUR INVOLVED COMMUNITY

Our goal is to strive to work together as a community to achieve the Ventura Vision through civic engagement, partnerships, and volunteer service.

State law requires each California city to adopt a comprehensive, long-term General Plan for the physical development of the community that guides local decision-making by expressing community goals about the future distribution and character of land uses and activities. The plan should be comprehensive by both covering the City's entire planning area and addressing the broad range of issues facing the community, including physical, social, aesthetic and economic concerns. The plan must be internally consistent and serve as a long-term guide, establishing policies for day-to-day land use decisions over an approximately 20-year period.

Introduction and Background

"To remain successful, Ventura must periodically renew itself, re-examine its goals and create a shared vision to guide the community into the future."

With these opening words, the citizens of our community proclaimed the **Ventura Vision,** which was unanimously accepted by the City Council in March 2000. That landmark report captured the results of "a partnership encompassing city government, non-profit organizations, community groups, businesses, schools and individual residents to chart the community's future through a process of visioning."

Building on that shared vision, the City embarked on an effort to revise the 1989 Comprehensive Plan that served as the General Plan that all cities are required by State law to use to guide land use, transportation and other important policy decisions. This new General Plan is the culmination of that effort to translate the Ventura Vision into a coherent and comprehensive implementation plan to guide future development and preservation.

Throughout the visioning process and at the ballot box, Ventura residents have made clear we want a well-planned approach to managing growth. We don't want continued suburban sprawl paving over farm land and sensitive hillside areas. Instead, we want vacant or run-down properties to be improved with high quality "infill" to provide new jobs, new homes and new stores and services.

Managing growth to improve our quality of life and standard of living is the smart thing to do. Ventura residents don't want uncontrolled growth and suburban sprawl. We also don't want traffic gridlock, more "cookie cutter" tract houses or housing prices that make Ventura unaffordable for working families. By targeting new development to areas that would benefit from reinvestment – and by respecting our historic character and sense of place – "smart growth" is a better alternative.

Our vision is for a prosperous and well-planned community. Smart Growth emphasizes reusing existing buildings and land, revitalizing our historic downtown and neighborhoods, and protecting the environment for future generations. Smart Growth channels new businesses and homes into appropriate areas. It also provides options for public transportation, creates neighborhoods where homes are in walking distance of local services and ensures green space for public use.

We seek to protect and enhance our unique "sense of place" that builds on our pride in Ventura's history and natural setting. Instead of new development that looks like everywhere else, our vision is for interesting, unique neighborhoods and districts, which reflect our values and heritage. The policies for pursuing these goals are spelled out in this new General Plan.

The Ventura General Plan

The *2005 Ventura General Plan* is the second in a series of three connected documents that will guide future conservation and change in the city. The *Ventura Vision* set the stage for this plan and enumerated four overarching principles that were affirmed by the community to guide Ventura into the future:

- Reach broadly and deeply into the community.
- Build on existing cultural, natural, and economic assets.
- Emphasize and encourage connections within the community.
- Work proactively and collaboratively to achieve the community's shared vision.

The final piece of the trilogy is a form-based *Development Code*. This code represents a new approach to zoning that prioritizes the appearance of development, while still ensuring that neighboring land uses are compatible and appropriate.

The *General Plan* will be put into action through the Development Code and a variety of other mechanisms, such as a mobility plan, specific plans, community plans, and capital improvement projects that will together shape the future of Ventura. The *General Plan* purposefully anticipates the *Code* focusing on the districts, corridors, and neighborhood centers where future change will be most pronounced.

The following vision statements reflect a high level of community consensus about a desired future for Ventura.

In the future, Ventura is a community that…

Environment

- Seeks sustainability by simultaneously promoting ecological health, economic vitality, and social well-being for current and future generations.
- Acts as an environmentally responsible model for other coastal areas.
- Protects and restores the natural character of its beaches, ocean views, hillsides, barrancas, and rivers as a scenic backdrop for its high quality urban environment.

Economy

- Develops a flourishing and balanced economy by encouraging a broad range of high quality employment and entrepreneurial opportunities.
- Encourages private economic development that supports public services and amenities associated with high quality of life.
- Has a vital, prosperous, and stable economy while maintaining its small-town feel.
- Is noted for private and public sector cooperation that enhances economic vitality.
- Actively participates in regional economic development efforts.

Planning, Design, and Circulation

- Retains its character as an attractive coastal town by growing slowly and sustainably, and by emphasizing its history, diversity, and natural environment.
- Cherishes its distinctive, diverse, and eclectic neighborhoods, and preserves their character.
- Has safe, accessible, and balanced transportation that promotes multiple modes of travel to local and regional destinations.

Social Activity

- Is known as an inclusive, diverse, and tolerant place that welcomes and celebrates all people.
- Provides all residents access to quality and affordable health and social services.
- Recognizes the importance of children and seniors by providing exceptional cultural, educational, and social support programs.
- Offers a diverse range of active and passive recreation for residents and visitors of all ages and abilities.
- Is dedicated to educational excellence and an emphasis on lifelong learning.
- Celebrates and is enriched by the arts and diverse cultural opportunities.

Collaboration

- Encourages residents to collaborate with each other and City government in an informed, active, and constructive manner to assess and resolve common issues.


ventura
seize
the future

Building on the Vision

Following adoption of the *Ventura Vision*, the City Council established a 19-member Comprehensive Plan Advisory Committee (CPAC) to shape the *Vision* concepts into issues and priorities for revision of the 1989 Comprehensive Plan. The CPAC included representatives of varied interests, including neighborhoods, agriculture, seniors and schools, as well as one member from the Planning Commission and one from the City Council. The committee met more than 30 times over almost three years. During that effort, the City published the August 2002 *Comprehensive Plan Update Background Report*, which provides a highly detailed account and analysis of opportunities and constraints that affect planning and land use in Ventura. This ultimately led to their findings, contained in the September 2003 *CPAC Issues & Alternatives Report*.

CPAC endeavored to create strategies to resolve planning and land use issues in Ventura utilizing the smart growth principles formulated by the U.S. Environmental Protection Agency:

- Mix land uses.
- Achieve compact building design.
- Provide a range of housing opportunities.
- Create walkable neighborhoods.
- Foster distinctive, attractive communities with a strong sense of place.
- Preserve open space, farmland, natural beauty, and critical environmental areas.
- Strengthen and direct development toward existing communities.
- Provide a variety of transportation choices.
- Make development decisions predictable, fair, and cost effective.
- Encourage community collaboration in planning decisions.

The recommendations of the CPAC were presented to the Planning Commission and City Council. After several months of reviewing the CPAC recommendations, the Planning Commission in December 2003 made some modifications to the CPAC's recommended land use scenario.

The City Council met 11 times from February through August 2004 to consider the CPAC and Planning Commission recommendations, review relevant data, and formulate broad goals, policies, and a diagram to guide growth and change in the City until 2025. In September 2004, the City Council established an ad-hoc General Plan Committee consisting of three Planning Commissioners and three City Council members to work with City staff and consultants to ensure that the *General Plan* would be completed expeditiously and with ample public participation, and to ensure open communication, transparency, and coordination among all parties interested in the creation of the *Plan*. All of the CPAC, Planning Commission, City Council, and General Plan Committee workshops, meetings, and hearings were open to the public and included significant, meaningful, and often extensive citizen input and participation.

Goals *summarize how conservation, development, and future growth should occur by identifying physical, economic and social ends that the community wishes to achieve.*

Policies *establish basic courses of action for the Planning Commission and City Council to follow in working to achieve community goals, by directly guiding the response of elected and appointed officials to development proposals and related community actions.*

Actions *need to be undertaken by the City to implement policies.*

Plan Format

The comprehensive and involved process of creating what is really a totally new (not just updated) *General Plan* – based on a new community vision and smart growth principles – resulted in a new set of goals, policies, and actions to guide future decision-making in Ventura that truly reflect the planning objectives of the community. These policy directives are organized by subject area in *General Plan* Chapters 1 through 10, which follow the organizational framework established in the *Ventura Vision* (see Table 1). Each topic is introduced with an overarching goal that carries forward the *Vision*, a description of issues needing resolution and methods for remedying them, and finally measurable policies and actions to achieve those solutions. Each of the policies contained within the Plan are intended to be understood and read with the following preface: "It is the intent of the City of San Buenaventura to...". All of the actions are summarized in table form in Appendix A, along with the City department or division responsible for implementing each action and timeframe for completion. Also included in the Plan are the legally binding Appendices B through E. Attachment A is provided as a reference, while Attachment B is provided to serve as guidelines for future development until an update to the Zoning Ordinance is completed.

Table 1
General Plan Organization

Vision/General Plan Chapter	Required/*Optional* Elements	Examples of Topics Covered
1. Our Natural Community	Conservation Open Space	Open space, hillsides, watersheds, riparian areas, sensitive plants and animals
2. Our Prosperous Community	*Economic Development*	Commercial and industrial growth, economic diversification, job opportunities, tourism
3. Our Well-Planned and Designed Community	Land Use/*Design* Housing *Park & Recreation*	Development patterns, neighborhoods, visual character, urban design, streetscapes, demographics, housing needs, affordability, constraints on production
4. Our Accessible Community	Circulation	Traffic, street network, parking, transit services, bike routes
5. Our Sustainable Infrastructure	Land Use	Water supply, wastewater treatment, drainage
6. Our Active Community	Land Use *Park & Recreation*	Park and recreation facilities, youth and senior programs
7. Our Healthy and Safe Community	Safety Noise Land Use	Development in hazardous areas, hazardous waste management, seismicity, flood control, water quality, brownfields, noise, police, fire, air quality
8. Our Educated Community	Land Use	Schools and libraries
9. Our Creative Community	*Culture*	Arts, events, community programs, cultural and historic resources
10. Our Involved Community	*Citizen Input*	Participation in governance

The format of the *General Plan* satisfies the State requirement that every general plan include policies for seven "elements," as follows:

Land use – establishes the general distribution and intensity of land uses, including housing, commerce, industry, open space, education, and public facilities.

Circulation – identifies the location and type of existing and proposed highways, arterial and collector roadways, bicycle routes, and other transportation facilities.

Conservation – addresses treatment of natural and cultural resources, including watersheds, wetlands, trees, rivers and barrancas, and cultural and historic landmarks.

Housing – assesses current and projected housing needs of all segments of the community and identifies land to provide adequate housing to meet those needs. Although the City's Housing Element and Technical Report is contained in a separate document to facilitate the frequent updating required by the State, the goals, policies and programs of the Housing Element must be and are consistent with the goals, policies, and actions of the *2005 Ventura General Plan.* (See Chapter 3, page 3-28, for 2004 Housing Element Goals and Policies.)

Noise – appraises noise sources in the community and develops means to mitigate nuisances.

Open Space – details techniques for preserving open space areas for natural resources, outdoor recreation, public health and safety, and agricultural activities.

Safety – establishes policies to protect the community from risks associated with seismic, geologic, flood, fire, and other hazards.

The *General Plan* also contains a number of special elements that aren't required by State law but are integral to the unique identity of Ventura. These cover a range of topics including education, recreation, arts and culture, and community involvement in local government. Another chapter treats the very important subject of the local economy, providing guidance to citizens, City staff and policy makers regarding strategies and priorities for economic development in Ventura.

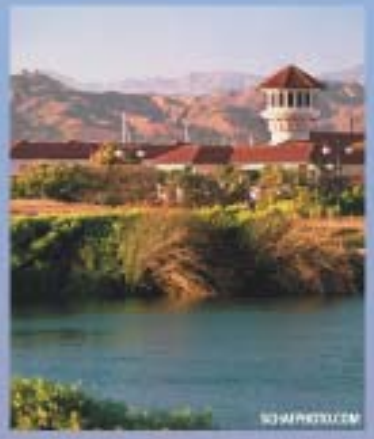
California Coastal Act

The *General Plan* also satisfies State requirements for the City's **Local Coastal Program** in accordance with the California Coastal Act (*Public Resources Code § 30000 et seq.)*. Actions in the *General Plan* that affect coastal resources are intended to become part of the Land Use Plan of the Local Coastal Program, which will be accomplished through specific or community plans for those areas. These actions are identified with the logo of the California Coastal Commission (which oversees all Local Coastal Programs). The basic goals of the State for the coastal zone are to:

- Protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources.
- Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state.
- Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resources conservation principles and constitutionally protected rights of the private property owners.
- Assure priority for coastal-dependent and coastal-related development over other development on the coast.
- Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.
  (Public Resources Code § 30001.5)

ventura's general plan

OUR NATURAL COMMUNITY



"As age comes on, one source of enjoyment after another is closed, but Nature's sources never fail. Like a generous host, she offers her brimming cups in endless variety, served in a grand hall, the sky its ceiling, the mountains its walls, decorated with glorious paintings and enlivened with bands of music ever playing."

— John Muir
20th Century Naturalist

CITY OF
VENTURA

1. OUR NATURAL COMMUNITY

Our goal is to be a model for other communities of environmental responsibility, living in balance with our natural setting of coastline, rivers, and hillside ecosystems.

Natural Context

Ventura's natural setting is one if its greatest assets, and preserving the environment is a top community priority. Situated between the ocean, hills, and two rivers, the city affords its residents and visitors with a significant amount of accessible, beautiful, and biologically diverse open space. Although a number of programs are in place to protect coastal and watershed ecosystems and to maintain and preserve existing open lands, some natural features in and around the city have been compromised by the impacts of human activity.

As in many communities across the nation, concern is growing in Ventura about human impacts on natural resources. The historic spread of local development has given rise to grassroots efforts aimed at preserving Ventura's viable agricultural land, open space, and hillsides. The 1995 Save Our Agricultural Resources initiative (see Appendix B) and the 2001 Hillside Voter Participation Area (Appendix C) measure require voter approval before the city can expand into open space areas. The Ventura Hillsides Conservancy formed in 2003 seeks to preserve local hillsides, canyons, and open space.

Ventura, Oxnard, Ventura County, and the County Local Agency Formation Commission have adopted agreements to preserve agricultural and open space land located between the cities. A change that amends these greenbelts requires the approval of all signatories.

Protecting Ventura's fragile natural resources is a fundamental focus of the *2005 Ventura General Plan*. Policies and actions in this chapter intend to ensure that coastal, hillside, and watershed features are preserved, remain visible and accessible, and demarcate boundaries for urban development to define and enhance the city's identity.

The community cherishes the shoreline as one of Ventura's best features. Coastal facilities in the city include:

- Emma Wood State Beach
- Ventura Seaside Park and Fairgrounds
- Surfers Point at Seaside Park
- Beachfront Promenade Park
- San Buenaventura State Beach
- Pierpont Community Beach
- Marina Beach/Cove Port District Beach
- Channel Islands National Park Headquarters
- Surfers Knoll
- Santa Clara River Mouth

Coastal Resources

Ventura boasts seven miles of beautiful sand beaches and valuable shoreline habitat. This "string of pearls" has long been identified by the community as one of the city's most prized features. At its eastern end, the Ventura Harbor offers opportunities for residents and visitors to explore the local marine environment, including the Channel Islands National Park and Marine Sanctuary. Elsewhere along the coast, shoreline and dune habitat provide nesting, feeding, and mating grounds for a wide variety of wildlife, including threatened or endangered species such as the western snowy plover and the least tern.

Shoreline conservation programs underway include the Surfers Point Managed Shoreline Retreat, San Buenaventura State Beach restoration, Ventura Harbor wetland rehabilitation, and coastline water quality monitoring. The City will continue to invest in restoration to enhance the shoreline ecosystem, with the actions in this chapter augmenting current efforts.

Hillsides

The hills of the Transverse Range rise 1,200 feet above Ventura, providing an important visual backdrop that frames the City. Not only do these hills provide residents and visitors with scenic vistas, they are also part of a larger integrated ecosystem comprised by the hillsides, coastal areas, rivers and barrancas that together provide a rich habitat for many species. It is vital to the community that these hillsides that lie outside the city limits (with a County land use designation of either Open Space or Agriculture), are protected and preserved.

These hillsides, by definition, are coterminous with the Hillside Voter Participation Area, and comprise the Hillside Open Space community as depicted on the General Plan Diagram (page 3-22). Because the Hillside Voter Participation Area measure prohibits the extension of City urban services to the hillsides through 2030 without voter approval, the General Plan Diagram identifies the hillsides affected by the measure with a Planning Designation of Open Space. The full text and map of the Hillside Voter Participation Area appears in Appendix C (as required by the act). This chapter calls working with land conservation organizations to establish a Ventura hillsides preserve, and Chapter 6, *Our Active Community*, contains actions to work with the County to create public trails in the hillsides.

Definitions for “Hillside Open Space,” “Hillside Area,” “hillsides,” and “Hillside Voter Participation Area” can be found in the Glossary (Attachment A).

Rivers and Barrancas

The Ventura River flows south to the Pacific Ocean along the western edge of the city, and the Santa Clara River bisects the Oxnard coastal plain south of Ventura. A series of seasonal watercourses called barrancas traverse the city in narrow incised drainage channels running down from the hillsides. The rivers and barrancas and their larger watersheds provide undeveloped open space, riparian vegetation, wildlife habitat and corridors, recreational opportunities, and aesthetic beauty.

Where local watercourses have not been channelized, riparian trees and shrubs grow in fringing woodlands and thickets. Several sensitive bird species breed in these areas, including the least Bell's vireo, willow flycatcher, yellow warbler, and yellow-breasted chat. Steelhead and rainbow trout seasonally inhabit both the Ventura and Santa Clara Rivers.

Riparian and freshwater marsh areas in Ventura represent only a remnant of pre-human coverage, but the City has initiated conservation and restoration efforts such as the Ventura River Estuary Program to help reverse this trend. The estuaries at the mouths of the Ventura and Santa Clara Rivers serve as breeding grounds and feeding areas for migratory and resident shorebirds and waterfowl, as well as home to many terrestrial animals, fish, and free-swimming invertebrates.

Actions in this chapter – such as maintaining adequate buffers from watercourses, requiring restoration of natural drainage features, and prohibiting the placement of manmade materials in drainages – can protect and improve water and habitat quality in local watersheds. The bolder action of removing concrete channel structures would further enhance natural functions and aesthetics.

Resource Conservation

As Ventura continues to grow, conserving resources, increasing energy efficiency, and achieving environmental sustainability become ever more important. The City desires to incorporate green building measures into the design, construction, and maintenance of public and private buildings which can result in significant cost savings and promote overall health and productivity of residents, workers, and visitors to the city. Raising conservation awareness can help minimize waste and pollution released into the natural environment. Improving energy efficiency in buildings, expanding recycling programs, and reducing transportation-related energy consumption will make the city a greener place. The policies and actions in this chapter provide clear direction to guide conservation, green practices, and responsible use of resources.

Policy 1A: Reduce beach and hillside erosion and threats to coastal ecosystem health.

Action 1.1: Adhere to the policies and directives of the California Coastal Act in reviewing and permitting any proposed development in the Coastal Zone.

Action 1.2: Prohibit non-coastal-dependent energy facilities within the Coastal Zone, and require any coastal-dependent facilities including pipelines and public utility structures to avoid coastal resources (including recreation, habitat, and archaeological areas) to the extent feasible, or to minimize any impacts if development in such areas is unavoidable.

Action 1.3: Work with the State Department of Parks and Recreation, Ventura County Watershed Protection Agency, and the Ventura Port District to determine and carry out appropriate methods for protecting and restoring coastal resources, including by supplying sand at beaches under the Beach Erosion Authority for Control Operations and Nourishment (BEACON) South Central Coast Beach Enhancement program.

Action 1.4: Require new coastal development to provide non-structural shoreline protection that avoids adverse impacts to coastal processes and nearby beaches.

Action 1.5: Collect suitable material from dredging and development, and add it to beaches as needed and feasible.

Action 1.6: Support continued efforts to decommission Matilija Dam to improve the sand supply to local beaches.

Action 1.7: Update the Hillside Management Program to address and be consistent with the Planning Designations as defined and depicted on the General Plan Diagram.

Policy 1B: Increase the area of open space protected from development impacts.

Action 1.8: Buffer barrancas and creeks that retain natural soil slopes from development according to State and Federal guidelines.

Action 1.9: Prohibit placement of material in watercourses other than native plants and required flood control structures, and remove debris periodically.

Action 1.10: Remove concrete channel structures as funding allows, and where doing so will fit the context of the surrounding area and not create unacceptable flood or erosion potential.

Action 1.11: Require that sensitive wetland and coastal areas be preserved as undeveloped open space wherever feasible and that future developments result in no net loss of wetlands or "natural" coastal areas.

Action 1.12: Update the provisions of the Hillside Management Program as necessary to ensure protection of open space lands.

Action 1.13: Recommend that the City's Sphere of Influence boundary be coterminous with the existing City limits in the hillsides in order to preserve the hillsides as open space.

Action 1.14: Work with established land conservation organizations toward establishing a Ventura hillsides preserve.

Action 1.15: Actively seek local, State, and federal funding sources to achieve preservation of the hillsides.

Policy 1C: Improve protection for native plants and animals.

Action 1.16: Comply with directives from regulatory authorities to update and enforce stormwater quality and watershed protection measures that limit impacts to aquatic ecosystems and that preserve and restore the beneficial uses of natural watercourses and wetlands in the city.

Action 1.17: Require development to mitigate its impacts on wildlife through the development review process.

Action 1.18: Require new development adjacent to rivers, creeks, and barrancas to use native or non-invasive plant species, preferably drought tolerant, for landscaping.

Action 1.19: Require projects near watercourses, shoreline areas, and other sensitive habitat areas to include surveys for State and/or federally listed sensitive species and to provide appropriate buffers and other mitigation necessary to protect habitat for listed species.

Action 1.20: Conduct coastal dredging in accordance with the U.S. Army Corps of Engineers and California Department of Fish and Game requirements in order to avoid impacts to sensitive fish and bird species.

Action 1.21: Work with State Parks on restoring the Alessandro Lagoon and pursue funding cooperatively.

Action 1.22: Adopt development code provisions to protect mature trees, as defined by minimum height, canopy, and/or trunk diameter.

Action 1.23: Require, where appropriate, the preservation of healthy tree windrows associated with current and former agricultural uses, and incorporate trees into the design of new developments.

Action 1.24: Require new development to maintain all indigenous tree species or provide adequately sized replacement native trees on a 3:1 basis.

Policy 1D: Expand the use of green practices.

Action 1.25: Purchase and use recycled materials and alternative and renewable energy sources as feasible in City operations.

Action 1.26: Reduce pesticide use in City operations.

Action 1.27: Utilize green waste as biomass/compost in City operations.

Action 1.28: Purchase low-emission City vehicles, and convert existing gasoline-powered fleet vehicles to cleaner fuels as technology becomes available.

Action 1.29: Require all City funded projects that enter design and construction after January 1, 2006 to meet a design construction standard equivalent to the minimum U.S. Green Building Council LEED™ Certified rating in accordance with the City's Green Building Standards for Private and Municipal Construction Projects. 

Action 1.30: Provide information to businesses about how to reduce waste and pollution and conserve resources.

Action 1.31: Provide incentives for green building projects in both the public and private sectors to comply with either the LEED™ Rating System, California Green Builder, or the Residential Built Green program and to pursue registration and certification; incentives include "Head-of-the-Line" discretionary processing and "Head-of-the-Line" building permit processing. 

Action 1.32: Apply for grants, rebates, and other funding to install solar panels on all City-owned structures to provide at least half of their electric energy requirements. 

Action 1.33: Publicly acknowledge individuals and businesses that implement green construction and building practices.

OUR PROSPEROUS COMMUNITY

ventura's general plan

"Every increment of construction should be done in such a way as to heal the city."

— Christopher Alexander
Author of *A Pattern Language*, 1977

CITY OF
VENTURA

2. OUR PROSPEROUS COMMUNITY

Our goal is to attract and retain enterprises that provide high-value, high wage jobs; to diversify the local economy; to increase the local tax base; and to anticipate our economic future in order to strengthen our economy and help fund vital public services.

Adapting in the 21st Century

Great communities are prosperous communities. A successful city brings people, institutions, ideas, and capital together in creative ways that enrich the lives of those who live and work there. In today's global economy, high-wage high-value jobs are the foundation of the prosperity that instills a city with the financial resources necessary to provide high quality of life and excellent community amenities.

Ventura has been blessed with a history of prosperity, thanks in large part to success in harnessing the area's natural assets for economic benefit. For most of the 20th Century, Ventura was sustained largely by its role as the hub of the region's oil and agriculture industries. These two sectors not only provided a stable source of jobs and business opportunities, but also helped to shape Ventura's role as the legal, governmental, and cultural center of the County.

In the 21st Century, however, Venturans can't take continued prosperity for granted. Competition occurs regionally, nationally, and globally for innovative businesses, top talent, and good jobs. The community must build on its resources and constantly be on the lookout for new economic opportunities.

County government will likely remain the city's largest employer, providing an important element of economic stability, but government employment is not likely to grow significantly. Oil and agriculture will continue to be important, but their roles are diminishing. While Ventura is a regional center for healthcare, that industry will continue to face intense pressures to reduce costs. Still, the City of Ventura is positioned to move into an era dominated by innovation and reliant on emerging technologies. Cities and regions that excel in the "New Economy" promote high tech industries and boast a high quality of life. Likewise, to remain competitive, Ventura must continue to support economic development, but also create a more attractive living environment, including by providing appropriate housing for all segments of the local workforce. Efforts to boost economic development must be supported by a high quality of life, including a thriving cultural arts scene, award winning schools, and an engaged community. Tourism is also a strong market for Ventura. The beaches, museums, downtown, harbor and the nearby Channel Islands National Park attract more than 1.5 million visitors a year.

The policies and actions in this chapter seek to identify business niches that can thrive locally to diversify the economic base and ensure future community prosperity.

Economic Challenges

Ventura faces a variety of interrelated challenges to continued economic vitality, including:

1. Capturing a share of high-value job markets, such as biotechnology, computer software, communications, entertainment, multimedia, education, and business and financial services.

2. Diversifying the local economy to reduce dependence on the service, retail, and government sectors.

3. Building on the success of the tourism, manufacturing, business, and financial services sectors through marketing and job training programs that will ensure retention and attraction of these enterprises.

4. Finding appropriate locations for commercial and industrial land, including through revitalization opportunities in the Westside and Downtown and possibly via annexations of sites in the North Ventura Avenue and 101 Business Corridor areas.

5. Expanding the retail base, because sales tax represents a major City revenue source.

6. Providing housing for the full range of workforce households at all income levels.

7. Providing adequate infrastructure and financing resources.

Meeting all of these challenges in an integrated, strategic manner will be necessary to achieve long-term economic stability and success. The City must endeavor to identify the businesses most likely to remain and grow in an area that has very high costs – especially for housing – but also has outstanding community amenities, including good weather, a spectacular natural setting, and a safe and desirable community fabric.

The *Ventura Vision* calls for targeting industries that demonstrate the greatest promise for long-term community prosperity by:

- Providing high-wage, high skilled jobs,
- Possessing a local competitive advantage in the global economy,
- Being committed to local responsibility,
- Growing from local ownership, control or management,
- Practicing environmental leadership in their markets, and
- Strengthening the community's creative, cultural identity.

The *Vision* also offers principles for the City to pursue in charting future strategies for economic development:

- Encourage a broad range of high-quality employment and entrepreneurial opportunities.
- Encourage private economic prosperity that can support public services and quality-of-life amenities.

- Develop a vital, prosperous, and stable economy while maintaining a "small-town" flavor.
- Encourage the public and private sectors to work together to achieve prosperity.
- Participate constructively in regional economic development efforts.

Implementing these strategies will not be simple or easy. For one reason, California's current tax system contains provisions that result in some of the lowest-paying economic sectors providing the city with the most tax revenue, and vice versa.

Pillars for Prosperity

Community prosperity is not something that a city government can create by itself. Any successful economic development effort requires the participation of many partners, including community-based business organizations, educational and training institutions, venture capitalists, individual entrepreneurs and business owners, networks of suppliers, and other government agencies that have a mission to enhance prosperity.

Together, the City and its economic partners must ensure that the building blocks for community prosperity are in place. These foundations include organizations and institutions that can coordinate local economic development efforts, as well as land and other economic infrastructure required to make Ventura an attractive business location.

This organizational infrastructure is evolving in Ventura. Business groups such as the Chamber of Commerce and the Ventura County Economic Development Association (a countywide group) are already active, but a wider network is needed to assemble the resources and capacity of entrepreneurs, venture capitalists, educators, and other stakeholders in building a healthy business climate. Greater synergy is needed among the area's higher education institutions – including California State University Channel Islands, Ventura College, Brooks Institute, and satellite campuses of other colleges and universities.

Appropriate and sufficient land will also be necessary to ensure continued economic prosperity over the next 20 years, even as we seek to protect open space and combat sprawl. Demand for land to support retail and office development is likely to outstrip current supply unless allowable building intensities are significantly increased. While some increased density is likely, and some older industrial land may be recycled for new business uses, the City must take care to reserve sufficient land for these purposes – especially in an environment where short-term pressure is likely to encourage conversion of land to commuter housing.

Thus, the strategy for community prosperity must be coordinated with area-specific planning efforts, especially on the Westside (where industrial land is likely to be recycled), Downtown (which must stress office, studio, and retail business growth as well as an emerging residential component), and in the 101 Corridor between Mills Road and

Johnson Drive (where most of the city's business activity now takes place). The City will advance on a set of defined focused areas:

Auto Center – efforts over the short term will focus on making the area a regional retail destination. The City will strengthen its partnership with Auto Center dealers to realize beautification projects and facilitate land use entitlements for additional dealerships.

McGrath Property – the 76-acre site provides Ventura with the very best opportunity to attract new industry with high-value, high-wage jobs. The City and property owners will work on securing project entitlement approvals and recruiting desired tenants. The objective is to attract targeted industries and provide the impetus for initial site development over the short-term.

Westside – the feasibility of establishing a redevelopment project area will be considered by the City and Westside citizens. Such legal designation would provide the resources needed to leverage and implement planned initiatives in various Westside plans. Brownfield reuse efforts will also continue to secure funding for much needed site assessment and remediation activities.

Upper North Avenue – the objective is to transform this area from an oilfield industrial area to a dynamic economic engine. Development efforts will address reuse of the former USA Petroleum site, including and evaluation of the site's potential to emerge as a component of a campus expansion opportunity for Brooks Institute. Keys to this effort are site remediation, compatibility issues, and future annexation to the City.

Downtown – proposed initiatives include well defined design standards in the updated Downtown Specific Plan, enhanced efforts to market the Downtown Cultural District, formation of a downtown management entity, and attracting uses that create "around–the-clock" activity.

Anticipating Our Economic Future – Ventura's economic growth is built on a foundation of concerted efforts that fuel innovation, collaboration, and continuous learning. The focus will be on attracting high technology and knowledge-based businesses including biotechnology, non-durable manufacturing, and business and financial services. Continuous learning opportunities for job seekers, workers, and employers will acknowledge demographic pressures and rapidly changing skill needs. Through specific strategies, the community will develop leaders for tomorrow, and attract and retain new graduates and skilled employees. Critical players will include the Workforce Investment Board, Ventura College, California State Channel Islands, and the Brooks Institute.

The policies and actions in this chapter attempt to provide the means to support these targeted efforts to achieve a stable and balanced economic base.

Policy 2A: Establish a clear economic strategy.

Action 2.1: Track economic indicators for changes that may affect City land resources, tax base, or employment base, such as terms and conditions of sale or lease of available office, retail, and manufacturing space.

Action 2.2: Prepare an economic base analysis that identifies opportunities to capture retail sales in sectors where resident purchasing has leaked to other jurisdictions.

Action 2.3: Maintain and update an Economic Development Strategy to implement City economic goals and objectives.

Policy 2B: Make the local economic climate more supportive of businesses investment.

Action 2.4: Map priority locations for commercial and industrial development and revitalization, including a range of parcel sizes targeted for high-technology, non-durables manufacturing, finance, business services, tourism, and retail uses.

Action 2.5: Share economic and demographic information with organizations that may refer businesses to Ventura.

Action 2.6: Encourage intensification and diversification of uses and properties in districts, corridors, and neighborhood centers, including through assembly of vacant and underutilized parcels.

Action 2.7: Partner with local commerce groups to recruit companies and pursue funding for business development and land re-utilization.

Action 2.8: Carry out Housing Element programs that provide housing to all segments of the local workforce.

Action 2.9: Expedite review for childcare facilities that will provide support to local employees.

Policy 2C: Encourage niche industries.

Action 2.10: Expedite review of the entitlement process for installation of infrastructure necessary to support high technology and multimedia companies.

Action 2.11: Allow mixed-use development in commercial and industrial districts as appropriate.

Action 2.12: Allow uses such as conference centers with resort amenities on appropriately sized and located parcels.

Action 2.13: Market the city to businesses that link agriculture with high technology, such as biotechnology enterprises.

Action 2.14: Partner with local farms to promote farmers markets and high quality locally grown food.

Policy 2D: Expand tourism opportunities.

Action 2.15: Provide incentives for use of waterfront parcels for recreation, visitor-serving commerce, restaurant, marina, and fishing uses.

Action 2.16: Work with the State to create year-round commercial opportunities at the fairgrounds.

Action 2.17: Partner with the Harbor District and National Park Service to promote Channel Islands tours and develop a marine learning center.

Action 2.18: Prioritize uses within the Harbor master plan area as follows: (1) coastal dependent, (2) commercial fishing, (3) coastal access, and (4) visitor serving commercial and recreational uses.

Action 2.19: Partner with hotels and the Chamber of Commerce to promote city golf courses.

Action 2.20: Promote outdoor recreation as part of an enhanced visitor opportunities strategy.

OUR WELL PLANNED COMMUNITY

ventura's general plan

"Communities should be designed to serve the cycle of the day and the cycle of the lifetime."

— Andres Duany
Architect & Town Planner

CITY OF
VENTURA

3. OUR WELL PLANNED & DESIGNED COMMUNITY

Our goal is to protect our hillsides, farmlands and open spaces; enhance Ventura's historic and cultural resources; respect our diverse neighborhoods; reinvest in older areas of our community; and make great places by insisting on the highest standards of quality in architecture, landscaping and urban design.

Our City

Ventura is a unique coastal community, proud of our heritage and dedicated to being a national model for effectively managing growth to protect our natural environment and continue to be a great place for us to live.

It is our public responsibility to plan and shape the physical realm to achieve these goals. Past policies, particularly the 1989 Comprehensive Plan, reined in rapid outward suburban sprawl. The 1992 Downtown Specific Plan set the direction for revitalization of the historic heart of our community. Voter-approved measures clearly underscored a mandate to protect agricultural resources and open space, particularly in our hillsides.

Guided by the Ventura Vision of 2000, the centerpiece for this General Plan is creating a "well-planned and designed community." The policies build on the foundation of the past. This plan also represents an historic commitment to *smart* growth:

1. Mix land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable communities
5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland, natural beauty, and critical environmental areas
7. Strengthen and direct development toward existing communities
8. Provide a variety of transportation choices
9. Make development decisions predictable, fair, and cost effective
10. Encourage community and stakeholder collaboration in development decisions

Source: U.S. Environmental Protection Agency

"**Smart growth** is about being good stewards of our communities and of our rural lands, parks, and forests. It is about ensuring that the best of the past is preserved, while creating new communities that are attractive, vital, and enduring."
--Michael Leavitt, EPA Administrator

Infill First

Ventura today is the product of decades of earlier growth and development. These patterns have largely established our community's character and will continue to do so in the future. The passage of SOAR, the Hillside Voter Protection Area, and other land-use constraints, along with natural boundaries, such as the ocean and the rivers, make it abundantly clear that before we expand outward any further, we must pursue an "Infill First" strategy. Such a strategy will help avoid sacrificing farmland and sensitive areas in our hillsides and along our rivers.

Our “Infill First” strategy for Ventura means avoiding suburban sprawl by directing new development to vacant land in the City and Sphere of Influence (with the exception of SOAR land), and by focusing new public and private investment in carefully selected districts, corridors, and neighborhood centers where concentrated development and adaptive reuse will improve the standard of living and quality of life for the entire community.

Recognizing that the rate of future population growth is not subject to City control, this plan has been analyzed (in the accompanying Environmental Impact Report) on the basis of estimates of what new homes and other development might be expected to take place over the next twenty years (see Table 3-2). Looking at the rate of growth over the past decade and recognizing the challenges to "infill" development compared to "greenfield" expansion, a projection of roughly 8,300 additional housing units and approximately 5 million square feet of non-residential development has been used for the plan's 20 year planning horizon. Table 3-2 provides estimates of the amount of development that could reasonably be expected to occur in the City and Sphere of Influence.

The actual distribution of future growth in the City may vary based on market forces and other factors. The districts, corridors, and neighborhood center areas, shown on Figure 3-1 Infill Areas, could accommodate more development and/or a different mix of development than shown in Table 3-2. To demonstrate this, Table 3-1 shows the potential development based on the overall carrying capacity of the land.

Distribution of growth in the districts and corridors is based on the following general assumptions:

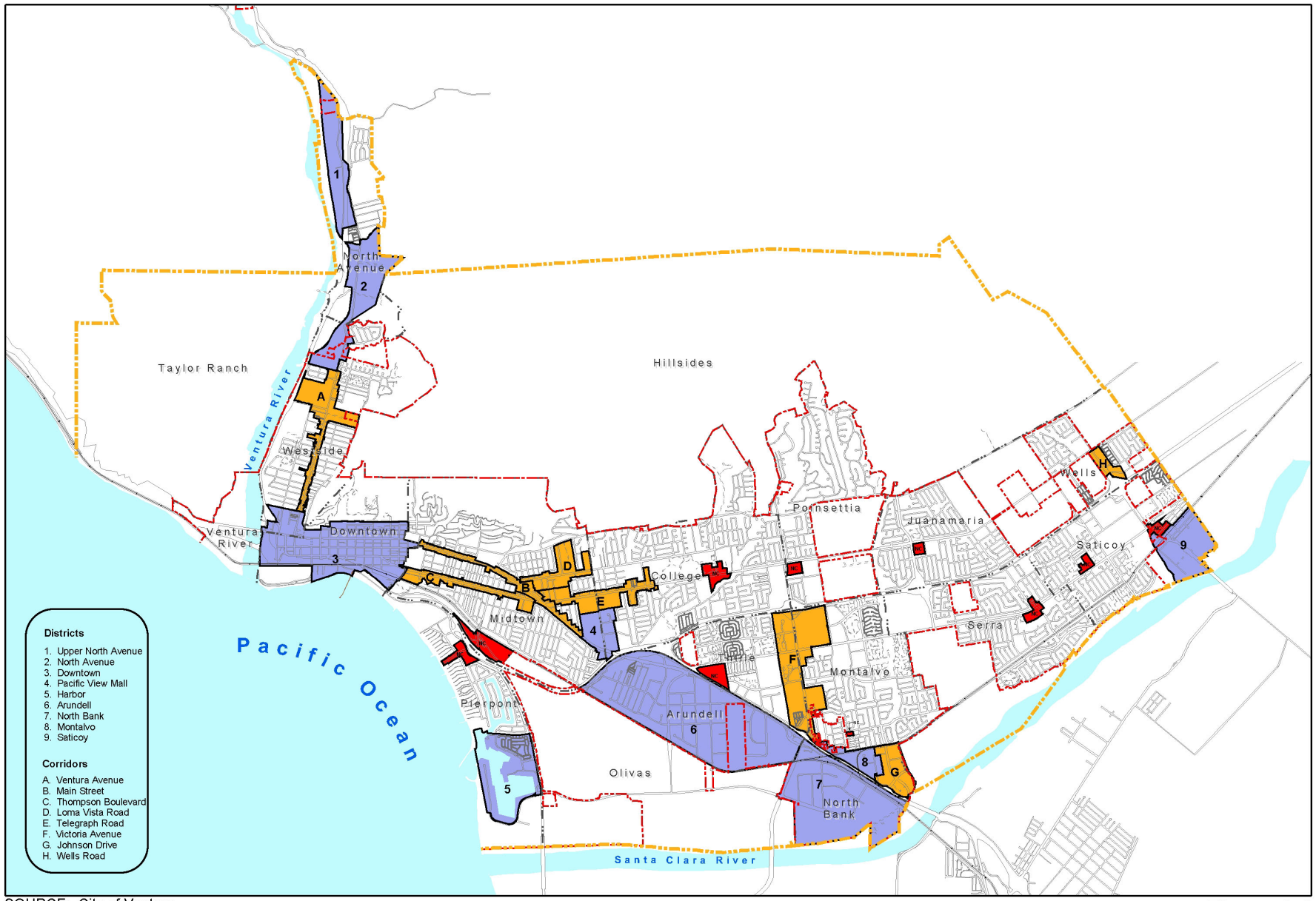
- Development in the Downtown and Harbor Districts will conform to the plans for those areas,
- The Downtown area and, to a lesser extent, the Ventura Avenue corridor will be the focus of future residential and commercial growth, and
- The Arundell, North Avenue, and Upper North Avenue areas will be the focus of future economic growth, potential expansion of the Brooks Institute, with some residential uses.

Table 3-1. Potential Development Based on Carrying Capacity of Land Area

Planning Designation	Allowed Density (du/acre)	Existing Development 2004					General Plan Capacity			
		Single Family Units	Multi Family Units	Comm./Ind. Sq. Ft.	Parcels	Acres	Vacant Parcels	Vacant Acres	Additional Potential[3] Units	Additional Potential[3] Sq. Ft.
Neighborhood Low	0-8	19,425	3,335	49,386	22,511	4,629	108	426	1,221	
Neighborhood Medium	9-20	1,163	8,965	149,513	4,414	1,061	32	116	4,859	
Neighborhood High	21-54	814	2,468	194,143	1,634	303	8	16	8,477	
Commerce[1]		257	490	4,995,248	1,366	808	95	108	7,892	22,328,276
Industry[2]		29	31	8,299,840	1,037	1,401	89	392	4,724	34,215,483
Public & Institutional		4	0	54,422	66	571				
Park & Open Space		6	0	15,491	264	11,693				
Agriculture		4	0	19,550	154	6,857				
Downtown Specific Plan	21-54	332	1,543	1,795,401	1,174	307	45	20	2,500	450,000
Harbor District		0	310	350,160	10	254	1	21	300	876,100
Total		**22,034**	**17,142**	**15,923,154**	**32,630**	**27,884**	**378**	**1099**	**29,910**	**57,869,859**

1. Commerce residential unit capacity is for property within a Corridor, District, or Neighborhood Center and assumes buildout to the maximum FAR and that 25% of floor area would be commercial (with the remainder residential).
2. Industry residential unit capacity is for property within a Corridor, District, or Neighborhood Center and assumes buildout to the maximum FAR and that 75% of floor area would be industrial (with the remainder residential).
3. "Additional Potential" assumes a historic buildout rate of 70% for both residential and non-residential.

Table 3-2. Predicted Development Intensity & Pattern	Residential Development (units)	Non-Residential Development (square feet)				
		Retail	Office	Industrial	Hotel	Total
DISTRICTS						
Upper North Avenue	100	10,000	50,000	150,000	-	210,000
North Avenue	50	10,000	50,000	250,000	-	310,000
Downtown Specific Plan	1,600	100,000	200,000	-	150,000	450,000
Pacific View Mall	25	25,000	-	-	-	25,000
Harbor	300	315,000	-	-	230,000	545,000
Arundell	200	25,000	300,000	1,000,000	-	1,325,000
North Bank	50	300,000	50,000	300,000	-	650,000
Montalvo	50	-	50,000	25,000	-	75,000
Saticoy	50	-	-	25,000	-	25,000
Subtotals (Districts)	**2,425**	**785,000**	**700,000**	**1,750,000**	**380,000**	**3,615,000**
CORRIDORS						
Ventura Avenue	800	40,000	100,000	50,000	-	190,000
Main Street	100	15,000	40,000	-	-	55,000
Thompson Boulevard	300	15,000	40,000	-	-	55,000
Loma Vista Road	25	15,000	40,000	-	-	55,000
Telegraph Road	250	15,000	40,000	-	-	55,000
Victoria Avenue	50	15,000	40,000	-	-	55,000
Johnson Drive	150	50,000	20,000	-	-	70,000
Wells Road	50	15,000	20,000	-	-	35,000
Subtotals (Corridors)	**1,725**	**180,000**	**340,000**	**50,000**	**0**	**570,000**
SPHERE OF INFLUENCE (SOI)/OTHER INFILL/NEIGHBORHOOD CENTERS						
101/126 Agriculture	200	-	-	-	-	-
Wells/Saticoy	1,050	-	-	-	-	-
Pierpont	100	30,000	-	-	-	30,000
Other Neighborhood Centers	100	-	-	-	-	-
Second Units	300	-	-	-	-	-
Underutilized	250	-	-	-	-	-
Vacant	450	165,000	50,000	-	-	215,000
Subtotals (Other Infill)	**2,450**	**195,000**	**50,000**	**0**	**0**	**245,000**
TOTAL INFILL	***6,600***	***1,160,000***	***1,090,000***	***1,800,000***	***380,000***	***4,430,000***
PLANNED AND PENDING DEVELOPMENTS						
Downtown	50	1,072	-	-	150,000	151,072
Ventura Avenue/Westside	238	7,086	-	27,000	-	34,086
Midtown	34	13,751	-	-	-	13,751
College (Telegraph/Loma Vista)	4	2,718	8,843	-	-	11,567
Telephone Road Corridor	256	-	54,785	-	-	54,785
Montalvo/Victoria	296	-	4,300	-	-	4,300
Saticoy/East End	840	7,950	5,600	-	-	13,550
Arundell	-	41,640	42,614	18,080	-	102,334
Olivas	-	7,160	7,066	390,053	-	404,279
Subtotals (Planned/Pending)	**1,718**	**81,377**	**123,214**	**435,133**	**150,000**	**789,724**
TOTAL (Infill+SOI/Other+Pending)	**8,318**	**1,241,377**	**1,213,214**	**2,235,133**	**530,000**	**5,219,724**



SOURCE: City of Ventura

Infill Sites

- Corridor
- Neigborhood Center (NC)
- District

- City Limits
- Planning Boundary
- Planning Neighborhoods

Figure 3-1
Infill Areas

Footnotes for Table 3-2:
Growth estimates for the Arundell community consider the likely development of the 75-acre McGrath property with a mix of uses and development of other vacant lands. Growth estimates for the North Bank area consider the possibility of a large retailer in that area. Estimates of growth in the SOI/Other Infill sites are based on the following general assumptions: (a) 101/126 Orchard site will develop similarly to a project recently proposed for that site; (b) Wells/Saticoy sites will develop in accordance with ongoing planning efforts for those areas; (c) the Pierpont area will develop generally in accordance with a conceptual project recently considered by the City; (d) Second Units will be added at a rate of 15/year; (e) roughly half of underutilized lands identified in the Housing Element will be re-developed over the next 20 years; (f) all vacant lands outside the districts and corridors will be developed in accordance with the proposed planning designations. Planned and Pending Developments based upon the City's 2004 Pending Projects list. Building areas do not include self storage facilities.
The following potential projects not included in the 2004 Planned and Pending Developments list have been included in the future development totals: (1) 150,000 square feet of industrial development in the North Bank area; (2) 165,000 square feet of retail development along Wells Road in the Saticoy area; (3) 50,000 square feet of office development on a 3.5-acre site along Ralston Drive. The Auto Center industrial project is included in the North Bank district; the other two projects are included in the "vacant" category. The square footage associated with these projects has been added to the projections of future growth to provide a conservative analysis of possible future impacts.

Together Table 3-2 and Figure 3-1, Infill Areas, offer a sense of how much growth Ventura might experience by 2025, and a picture of where such change is likely to occur. Precisely how and when development happens and what resources are conserved will be determined by the actions presented in the ten chapters of the *General Plan*, and by the specific land development standards. This plan is one of many tools the City will use to control where and how any future development takes place.

21st Century Tool Kit

The City has a wide array of tools at its disposal to achieve our "Infill First" strategy in ways that respect Ventura's heritage and result in beautiful buildings, blocks, streetscapes, and public places that enhance and enrich quality of life for the entire community. Shaping the City's physical form in the 21st Century will be achieved most effectively and aesthetically by combining Planning Designations with a transect-based approach, and with a new form-based Development Code. Together these can strongly influence the design and functioning of Ventura's distinct and unique neighborhoods, districts, and corridors.

The policies and actions in this chapter seek to enrich Ventura's urban fabric through appropriate design that showcases the attractive features of neighborhoods, districts, and corridors. To promote high-quality infill, the policies and actions encourage neighborhood centers, pedestrian access, established and desirable building types, and dynamic, neighborhood-serving nodes of mixed-use development along primary streets and corridors. This chapter specifically calls for detailed attention to community design through a form-based approach.

Neighborhoods: The Basic Building Blocks of Community

Like any great city, Ventura has grown around the basic unit of the neighborhood. A true neighborhood is not a subdivision of similar houses disconnected from surrounding places. Instead it is an identifiable area containing a neighborhood center with a pedestrian-friendly mix of uses and a palette of housing types for people in all stages of their lives. Neighborhoods are often defined by a quarter-mile "pedestrian shed" (see Figure 3-2), in which most residents' daily needs can be met within a five-minute walk. The organic nature of neighborhoods and their interdependency is what makes them viable for generations. Neighborhoods are not static places that resist change, but rather evolve naturally through periods of transformation to accommodate new residents' needs and desires.

> "In a neighborhood, everything that is needed is there and everything that is there is needed."
> - Anonymous

SOURCE: City of Ventura, Created for the Midtown Ventura Design Charette, March 2005

Northeast corner of Five Points

Theoretical 5 minute walk (1/4 mile)

Theoretical 10 minute walk (1/2 mile)

Actual 5 minute walk (1/4 mile)

Actual 10 minute walk (1/2 mile)

Figure 3-2
Pedestrian Shed, Theoretical versus Actual

The City is rich in a variety of neighborhoods, most of which are within one of Ventura's distinct communities. A total of 17 communities were identified in the 1989 Comprehensive Plan and have been carried forward, with some modifications to allow for a more detailed approach to describe Ventura's geography. Figure 3-3 illustrates 19 distinct communities, some of which are composed of a group of neighborhoods, each boasting their own unique attractions and potential. The oldest settled area is nearest the ocean, with newer areas found eastward, with the exception of Saticoy. Some of Ventura's communities have neighborhood centers established around parks, community gathering places, or civic buildings, and contain or are near services they share with surrounding areas, such as schools, libraries, post offices, and specialty shopping.

Ventura also has residential subdivisions and commercial and industrial districts that could evolve into true neighborhoods. A long-term strategy should be developed to gradually transform these areas that do not yet follow the neighborhood pattern. Existing subdivisions could be linked by pedestrian routes to new small-scale retail and service centers. Congested commercial areas could be redesigned as mixed-use centers on a grid of streets with walkable blocks that connect with surrounding neighborhoods and central plazas. These streets could be lined with buildings containing upper level housing and lower level commercial, office, and civic spaces that hide internal parking structures. Industrial sites that are fast converting to light industry, high tech manufacturing, and assembly could become factory villages with green space, multiple types of housing, small-scale retail to serve workers, and spin-off businesses.

Ventura's 19 communities (Figure 3-3) can each be enriched by using the *transect* (see discussion page 3-10) as a lens to understanding the ways in which it functions and by applying form-based development controls to respect and enhance its character to ensure that, where appropriate, each community provides one, if not more, walkable neighborhoods.

SOURCE: City of Ventura

---- City Limits

- - - Planning Communities

Figure 3-3
Planning Communities

Taylor Ranch
This area is essentially undeveloped, with agriculture as the primary activity. Taylor Ranch is within the City's Planning Area, including a portion within the Coastal Zone Boundary.

Ventura River
This area includes the Ventura River Basin, is within the Coastal Zone Boundary, and with Emma Wood State Beach Park, its major activity is recreation offering day use and overnight camping. Opportunities exist for passive recreation and nature study.

Hillside Open Space
Within the City's Planning Area, is undeveloped, and designated Open Space. Plant communities include chaparral, riparian willow forest, and oak woodland. This area has tremendous potential for passive recreation including scenic trails with panoramic views. This area is coterminous with the Hillside Voter Participation Area or "HVPA" (see Chapter 1 and Appendix C).

North Avenue
Within the City's Planning Area. Historically, largely oilfield industrial. Includes both the Upper North Avenue and North Avenue districts, and is home to the Brooks Institute, which is world renown for its professional photographic and motion picture education. Opportunities exist to strengthen the economy of this area and provide for the expansion of the Brooks Institute into a campus-village including spin-off businesses with a mix of housing types and transit options for all ages.

Westside
Includes the Ventura Avenue corridor and is home to several neighborhood centers that are surrounded by well-connected neighborhood blocks. Opportunities exist to realize the potential of neighborhood improvements initiated in ongoing and past grassroots efforts, such as the Westside Revitalization Plan. This community includes "Hillside Areas" (see definition in Attachment A), which are subject to the Hillside Management Program that provides necessary development criteria in order to retain the natural qualities and minimize potential hazards.

Downtown
The area is regulated by the Downtown Specific Plan. This community is both an urban core with opportunity to grow economically stronger, and the historic center of the City. Civic uses include City Hall, Seaside Park, Grant Park, the Ventura County Museum, San Buenaventura Mission, and is home to a number of historic sites and landmarks. Additional opportunity to enhance the area's already strong cultural climate, including art, cookery, music, performance, and entertainment. Tremendous potential to create "around-the-clock activity" leading to increased vitality. This community includes "Hillside Areas".

Midtown
Includes the Main, Thompson, and Loma Vista corridors, a portion of the Telegraph corridor, as well as the Seaward/Alessandro neighborhood center. Home to the Pacific View Mall, the City's Bus Transfer Center, Ventura High School. Blanche Reynolds Park, Ocean Avenue Park,

and Memorial Park. Includes a small amount of agriculture. Opportunities exist to realize potential improvements initiated in ongoing and past grassroots efforts, such as Midtown by Design, and more recently the Midtown Urban Design Charrette. This community includes "Hillside Areas".

Pierpont
Within the Coastal Zone Boundary, a unique-beach oriented predominantly residential community, with high-quality beachfront homes. Includes the Harbor district and the Pierpont neighborhood center. Home to the Ventura Harbor, Seaward Elementary School, a mobile home park, and Marina Park. Currently offers highway retail such as motels, hotels, and fast food, but opportunity exists to offer residents and visitors with more attractive and improved neighborhood and coastal oriented services and to develop a specific plan for the Harbor district.

College
Includes a portion of the Telegraph corridor, and the College/Day neighborhood center. Major civic uses are Arroyo Verde and Camino Real Park, Ventura Community College and Buena High School. This community includes "Hillside Areas".

Thille
Includes the Gateway neighborhood center and shares the Victoria corridor with Montalvo to the east. Contains mix of housing types built mostly between 1960 and 1980, with some newer development in the 1990's and early 2000's. Its primary civic use is the County Square Linear Park

Arundell
This community contains the main industrial and warehouse district of Ventura, but also has mixed-use areas with retail, restaurants, and offices within walking distance of many workers. Callens Road, the historic center of this community, has great potential to expand and increase the mix of uses it contains, including residential. A significant vacant parcel, the 75-acre McGrath property, offers great economic opportunity to attract new industry that provides high value, high wage jobs to the City.

Olivas
Predominantly agricultural. Its major civic use is the Olivas Park Golf Course and is home to the Olivas Adobe. Contains some commercial and industrial.

North Bank
This community contains a portion regulated by the Auto Center Specific Plan. Its major civic use the Buenaventura Golf Course. Predominantly industrial, with some agriculture. Opportunity to enhance the area as a regional retail destination, while providing workforce serving retail uses.

Poinsettia
Includes the Victoria Plaza neighborhood center. Its primary civic uses include elementary and middle schools. Predominantly residential, with some housing in the Hillside Area, and a significant amount of agricultural operations.

Montalvo
Includes the Johnson Drive corridor, Bristol neighborhood center, and shares the Victoria corridor with Thille to the west. Its major civic use is the County Government Center (equal size to 12 downtown blocks), but also the Rancho Ventura Linear Park and the Barranca Vista Park. Contains mix of housing types and is home to the Metrolink Station.

Serra
Includes the Telephone/Petit neighborhood center, and is home to the City's newest civic use – the Community Park, set to open Fall 2005. Also includes the Chumash Park, Junipero Serra Park, North Bank Linear Park, and Bristol Bay Linear Park. Contains a significant amount of agricultural land.

Juanamaria
Includes the Kimball/Telegraph neighborhood center. Primary civic use is Hobert Park; this community contains some agricultural land.

Wells
Includes the Wells corridor. The Brown Barranca runs through the northerly portion of this area. Contains agricultural land.

Saticoy
Includes the Telephone/Cachuma and Saticoy neighborhood centers and the Saticoy district. Developed originally as a rural town in the late 1800s, Saticoy has the full range of transect characteristics: from the Santa Clara river and the rural eastern edge, to its neighborhood centers, and a mix of housing types at various intensities. Its major civic uses are the Fritz Huntsinger Youth Sports Complex, Saticoy Regional Golf Course and the Saticoy neighborhood park.

Planning Designations and Transect Zones

Land in the City's Planning Area is divided into eight basic Planning Designations on the General Plan Diagram (page 3-22). Each acknowledges a particular predominant development pattern that exhibits certain desirable characteristics, such as building types and functions that can be measured and described.

The wide range of building forms in Ventura offers great potential for compatible infill and viable mixed-use projects in existing neighborhoods, districts, corridors, and neighborhood centers. The wealth of building types includes attached and detached housing, duplexes, courtyard bungalows, second units (often over garages), lofts (some live-work), urban villas, neighborhood shopfronts, concentrated retail developments, and civic buildings. Public buildings retain special importance by serving as prominent landmarks that shape the visual character of the city.

Streetscapes set the tone for quality of life in Ventura by providing the shared outdoor living space of the community. Although the city's distinct neighborhoods, commercial and industrial districts, and agricultural areas are linked by corridors that have evolved primarily to accommodate motor vehicles, opportunities abound to make those streets more livable and to focus activities in neighborhood centers that emphasize walking, biking, and public gathering, and thereby ease traffic and reinforce community vitality. Accordingly, new development needs to be high quality, compact, and walkable, and it should incorporate design diversity that increases lifestyle choices and bolsters commerce and industry.

Determining which building types are most appropriate in specific locations requires shifting away from conventional zoning that emphasizes use toward a form-based approach that prioritizes function, appearance, and compatibility with surrounding context. A powerful tool for understanding this context is the *Transect*, which depicts the continuum from rural to urban conditions (see Figure 3-4).

The transect is a tool that can be used by the community to understand and describe the full range of unique environmental and built characteristics within each of Ventura's neighborhoods. Using the six parenthetical transect zones to better understand the broad Planning Designations of the General Plan Diagram, a finer-grained (site specific) set of development standards can be created to ensure that new development is in keeping with local preferences for building.

This new Development Code will better accommodate the diversity of lifestyles Ventura desires – from the *rural* farm to the *sub-urban* house and yard to the *urban core* with apartments above shops – and will contribute to the identity and character desired by the community. Common elements that the transect will help measure and describe, and that the Development Code will prescribe, include the types and

arrangements of buildings, their "intensity" of lot coverage, height and mass, the details of streets, public and private frontages and the requirements for and character of open spaces. In general it will prescribe individual neighborhood preferences for urban design and building characteristics, including standards.

In many cases, area specific codes, applying the Planning Designations including districts, corridors, and neighborhood centers, will be developed as part of community or specific plans that establish a detailed strategy for public and private investment and policies to promote the appropriate preservation and development of community desired character.

The following descriptions of the Planning Designations include a parenthetical reference to the transect zones they encompass that will be used as guidance in interpreting the planning designations while drafting detailed plans and codes:

"A **transect** is a geographical cross-section of a region used to reveal a sequence of environments. For human environments, this cross-section can be used to identify a set of habitats that vary by their level and intensity of urban character, a continuum that ranges from rural to urban. In transect planning, this range of environments is the basis for organizing the components of the built world: building, lot, land use, street, and all of the other physical elements of the human habitat."
--SmartCode, Volume 6.5, 2005

"All architecture should be beautiful. All towns should be beautiful. Beauty nurtures the soul and the spirit. It makes life worth living."
-Camillo Sitte

- Neighborhood Low – *(T3 Sub-Urban and T4 General Urban)*
emphasizes detached houses with some attached units in a small mix of building types from 0 up to 8 dwelling units per acre. Predominantly residential, with opportunity for limited home occupation and neighborhood services sensitively located along corridors and at intersections.

- Neighborhood Medium – *(T3 Sub-Urban, T4 General Urban and T5 Urban Center)*
anticipates a mixture of detached and attached dwellings and higher building types at approximately 9 to 20 dwelling units per acre. Predominantly residential with small scale commercial at key locations, primarily at intersections and adjacent to corridors.

- Neighborhood High – *(T3 Sub-Urban through T6 Urban Core)*
accommodates a broader mix of building types, primarily attached, from 21 to 54 dwelling units per acre; A mix of residential, commercial, office, and entertainment that includes mixed-use buildings.

- Commerce – *(T4 General Urban through T6 Urban Core, neighborhood center downtown, regional center, town center or village center)*
encourages a wide range of building types of anywhere from two to six stories (depending on neighborhood characteristics) that house a mix of functions, including commercial, entertainment, office and housing.

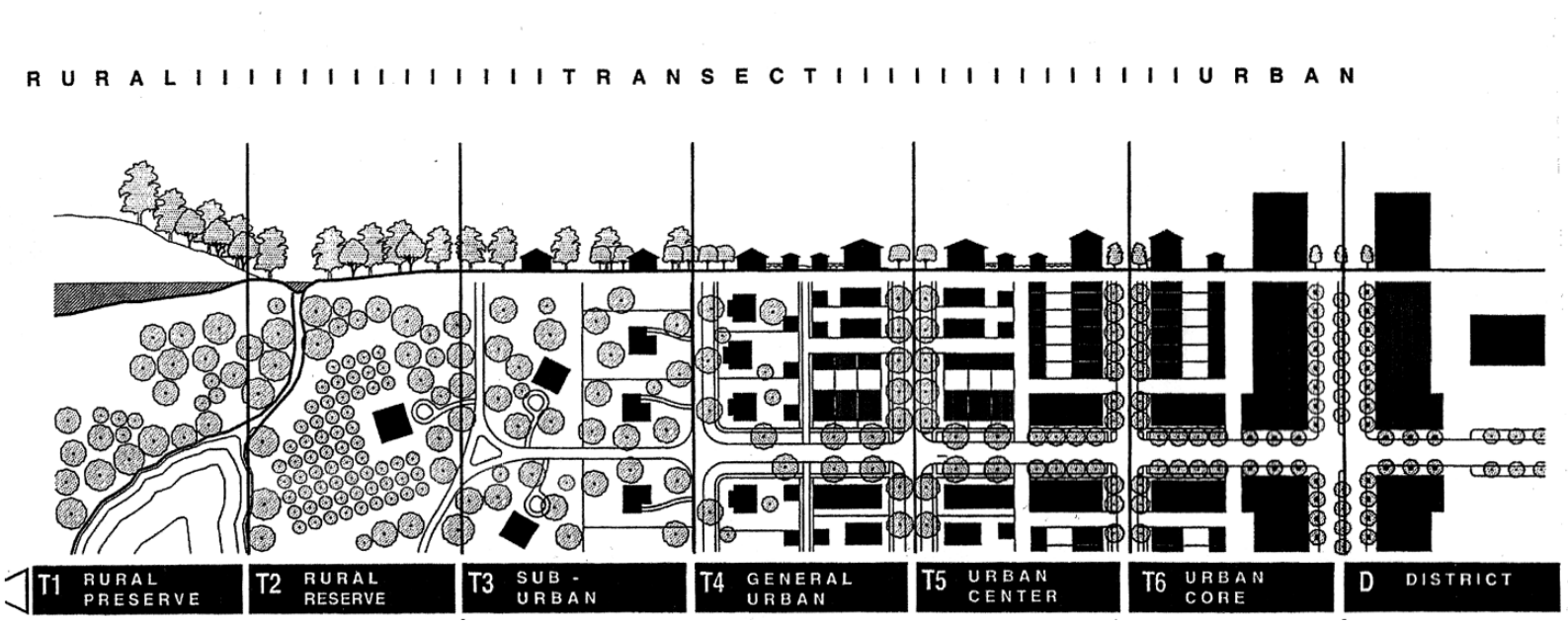
- Industry – *(T2 Rural through T6 Urban Core)*
encourages intensive manufacturing, processing, warehousing and similar uses, as well as light, clean industries and support offices; also encourages workplace-serving retail functions and work-live residences where such secondary functions would complement and be compatible with industrial uses. Primarily large-scale buildings. Also can be developed as Transit Oriented Development, employment center or working village with a mix of uses.

- Public and Institutional – *(T1 Preserve through T6 Urban Core)*
accommodates civic functions such as government offices, hospitals, libraries, schools and public green space.

- Agriculture – *(T2 Rural)*
predominantly commercial cultivation of food and plants and raising of animals.
Pursuant to SOAR: The Agricultural use (not to be considered until after the Year 2030) category identifies those lands that are designated for agricultural use on the General Plan Diagram. The target date of 2030 associated with the Agricultural Use designation indicates a review date after which agriculturally designated lands may be reconsidered for urban uses. However, during the life of this Plan as amended by initiative, it is intended that only agricultural uses are permitted on these lands, except as such lands may be appropriate to public open space and recreational usage. Furthermore, any updates to this Plan are not intended to imply that development would necessarily be appropriate at that time.

- Parks and Open Space – (*T1 Preserve through T6 Urban Core)*
designate lands to public recreation and leisure and visual resources, and can range from neighborhood tot lots and pocket parks to urban squares and plazas and playgrounds to large regional parks and natural preserves.

Figure 3-4. The Transect



Transect: a system of ordering human habitats in a range from the most natural to the most urban. For convenience, the Transect is divided into six zones which describe the physical character of place at any scale, according to the intensity of land use and urbanism. The T-Zones are T1 Natural, T2 Rural, T3 Sub-Urban, T4 General Urban, T5 Urban Center, and T6 Urban Core.

Natural Zone (T1): consists of lands approximating or reverting to a wilderness condition, includes lands unsuitable for settlement due to topography, hydrology, or vegetation.

Rural Zone (T2): consists of lands in open or cultivated state or sparsely settled. These may include woodlands, agricultural lands, grasslands and irrigable deserts.

Sub-Urban Zone (T3): though similar in density to conventional suburban residential areas, differs by its superior connectivity and by allowing home occupations. It is typically adjacent to other urban T-zones. This zone is naturalistic in its planting. Blocks may be large and the roads irregular to accommodate site conditions.

General Urban (T4): has a denser and primary residential urban fabric. Mixed-use is usually confined to certain corner locations. This zone has a wide range of building types: singles, side yard and rowhouses. Setbacks and street tree settings are variable.

Urban Center (T5): is the equivalent of the main street area. This zone includes mixed-use building types that accommodate retail, offices and dwellings, including rowhouses and apartments. This zone is a tight network of streets and blocks with wide sidewalks, steady street tree planting and buildings set close to the frontages.

Urban Core (T6): is the equivalent of a downtown. It contains the densest urbanism – the tallest buildings and the greatest variety of uses, particularly unique ones such as financial districts and important civic buildings. This zone is the least naturalistic of all the zones; street trees are formally arranged or non-existent.

Source: Duany, Plater Zyberk & Company's SmartCode, Volume 6.5, Spring 2005

The General Plan Diagram (page 3-22) also depicts the Downtown, Auto Center, and Saticoy Village Specific Plan areas, which are subject to detailed standards for form and use. In addition, the Diagram identifies Districts, Corridors, and Neighborhood Centers – where the development of housing alongside commercial uses is specifically encouraged. These Districts, Corridors, and Neighborhood Centers make up the growth priority areas as the City's "Infill First" strategy (See Figure 3-1 Infill Areas).

Districts, Corridors, and Neighborhood Centers

One of the primary objectives for infill in Ventura is to produce mixed-use development that places most people's daily needs within walking distance of their dwellings. This may include encouraging "flex space" where a single building functions as both living and working area for the owner, combining housing and commercial uses in the same structures, or sensitively integrating small-scale retail, service, and entertainment within convenient distance of residential areas. Mixed-use places inherently reduce automobile trips and improve the pedestrian experience, resulting in safer neighborhoods, healthier citizens, and better access to everyday needs. The City's corridors and districts already encompass significant mixed-use development. Opportunities exist to augment those areas in ways that complement and enhance existing urban form and streetscapes to better serve Ventura's residents.

Districts

Districts consist of streets or areas emphasizing specific types of activities and exhibiting distinct characteristics. A neighborhood or parts of neighborhoods can form a district. A thoroughfare may also be a district, such as when a major shopping avenue runs between adjoining neighborhoods. The following nine districts are depicted on the General Plan Diagram:

1. Upper North Avenue – home to a mix of industrial uses, including an abandoned oil refinery and Brooks Institute. Tremendous opportunities exist for the remediation and reuse of the former USA Petroleum site, as well as for the expansion of the Brooks Institute as a campus village, surrounded by a green edge to define the upper limits of Ventura.

2. North Avenue – an area with oilfield, industrial, and residential development, which has potential to fully develop into a more balanced mix of building types and uses with unique character, to serve as a major neighborhood anchor for northwest Ventura.

3. Downtown – the most intensely developed area of the city and its urban core. The Downtown Specific Plan regulates this area. Proposed initiatives include well-defined design standards via the Downtown Specific Plan update; enhanced efforts to market the Downtown Cultural District; formation of a

downtown management entity; and attracting uses that create "around–the-clock" activity.

4. Pacific View Mall – an enclosed shopping center and adjacent commercial uses. Large expanses of surface parking paired with significant building mass offer opportunity for the reintroduction of the block pattern and a reinvention of single-use retail into a much more sustainable mix of high intensity uses.

5. Harbor – an area with visitor serving uses, marine facilities, boating and commercial and recreational fishing activities, as well mixed-use places. A specific plan (based on the draft Harbor Master Plan) is being prepared for the Harbor District that will ensure a mix of uses, including residential, and highly defined public frontages and shared civic space for increased accessibility to ocean-front amenities.

6. Arundell – is currently an industrial center with a mix of small-scale industrial uses, business park development, and limited retail services. The McGrath Property – is a 76-acre site of undeveloped land that could provide the catalyst for Ventura's redefinition of 21st Century light industry, manufacturing, research and development, and technological innovation. It is centrally located in the Arundell area, which is ripe for redevelopment into a new form of community plan and building that incorporates large-scale employment, workforce housing and neighborhood commercial in an economically diverse setting.

7. North Bank – a combination of automobile retail, regulated by the Auto Center Specific Plan, and industrial/business park uses. Auto Center – efforts over the short tem will focus on making the area a regional retail destination. The City will strengthen its partnership with Auto Center dealers to realize beautification projects and facilitate land use entitlements for additional dealerships, as well as nurture creative partnerships to discover potential for unique attractions of regional interest.

8. Montalvo – an area of industrial and heavier commercial uses, and currently home to the Metrolink Station. Because of the strategic location of this area between east and west Ventura and it's transportation-rich infrastructure, it needs a strong plan for connectivity and a strategic mix of uses for evolution that is economically sustainable.

9. Saticoy – a mix of homes, older industrial and agricultural operations, and the planned site for the County maintenance yard. The Saticoy Village Specific Plan governs a small portion of this area. A larger effort should ensure Saticoy's seamless connection with adjacent areas, including a greenspace and circulation plan.

Corridors

Corridors, which can be natural or urban, often form boundaries, as well as connections, between neighborhoods and/or districts. Natural corridors can be those such as streams, barrancas, canyons, or green parkways. Urban corridors can be transportation thoroughfares that frequently encompass major access routes, especially ones with commercial destinations, including transit routes and rail lines. The following eight urban corridors are depicted on the General Plan Diagram. Each has the potential to evolve into a vibrant mixed-use City street with a distinct character borrowed from the neighborhoods that share it:

A. Ventura Avenue – a mix of older, small-scale commercial, industrial, and residential uses, with potential to grow even more vibrant by building on existing strengths, including its historic role as a major "working center." Using the warehouse model and diversity of building materials as a cue, "The Avenue" could harness cultural expression and become an eclectic center for the emerging arts and manufacturing crafts.

B. Main Street – currently a commerce-oriented area with a limited amount of mixed use development, this corridor displays the broadest range of architectural types and styles in the city, as well as the widest spectrum of transect characteristics. It has the most potential for increased mixed use and housing with improved streetscape and pedestrian enhancement to slow traffic.

C. Thompson Boulevard – a commercial thoroughfare in need of streetscape improvements and pedestrian amenities, this corridor is much like Main Street in that it boasts tremendous history as a "gateway to Ventura" and epitomizes a beach town character. It is a natural for a major transit or streetcar corridor, where nodes of mixed-use development and pedestrian and bike enhancement could support parallel neighborhoods and increase access to the ocean.

D. Loma Vista Road – a mix of commercial and residential development at varying scales, with a high concentration of medical facilities, this is the ideal place for Ventura to focus on creating a concentration of medical and research-centered business, with a high intensity of workforce housing and services housed in large-scale mixed-use buildings of high-tech character and serviced by increased transit.

E. Telegraph Road – a sub-urban-scale commercial area with some detached homes and multifamily buildings. The City's bus transfer station is located along this corridor, creating the perfect opportunity for a multi-modal connection with an intense node of housing and employment. The streetscape could change character along its length, with a mixture of intensities of development.

F. Victoria Avenue – currently a wide artery with high traffic volumes and shopping centers, Victoria needs effective traffic management

and pedestrian and streetscape improvements with strong attention to additional mobility options. Actions in this General Plan, along with the new Development Code, will call for revitalizing this corridor by redesigning the current array of single-use shopping centers and retail parcels with a mix of building types, uses, and public and private frontages. By eliminating "big box", mega-block, auto-oriented strip development, and the traffic patterns it generates, Victoria Avenue could create tremendous opportunity for healthy economic investment in walkable blocks, connected to better serve surrounding neighborhoods. Creative solutions, including dedicating transit or streetcar lanes, wider sidewalks, and bike lanes could transform Victoria's image into a regional thoroughfare of great and sophisticated diversity. All new commercial development within the Victoria Avenue corridor must follow this approach.

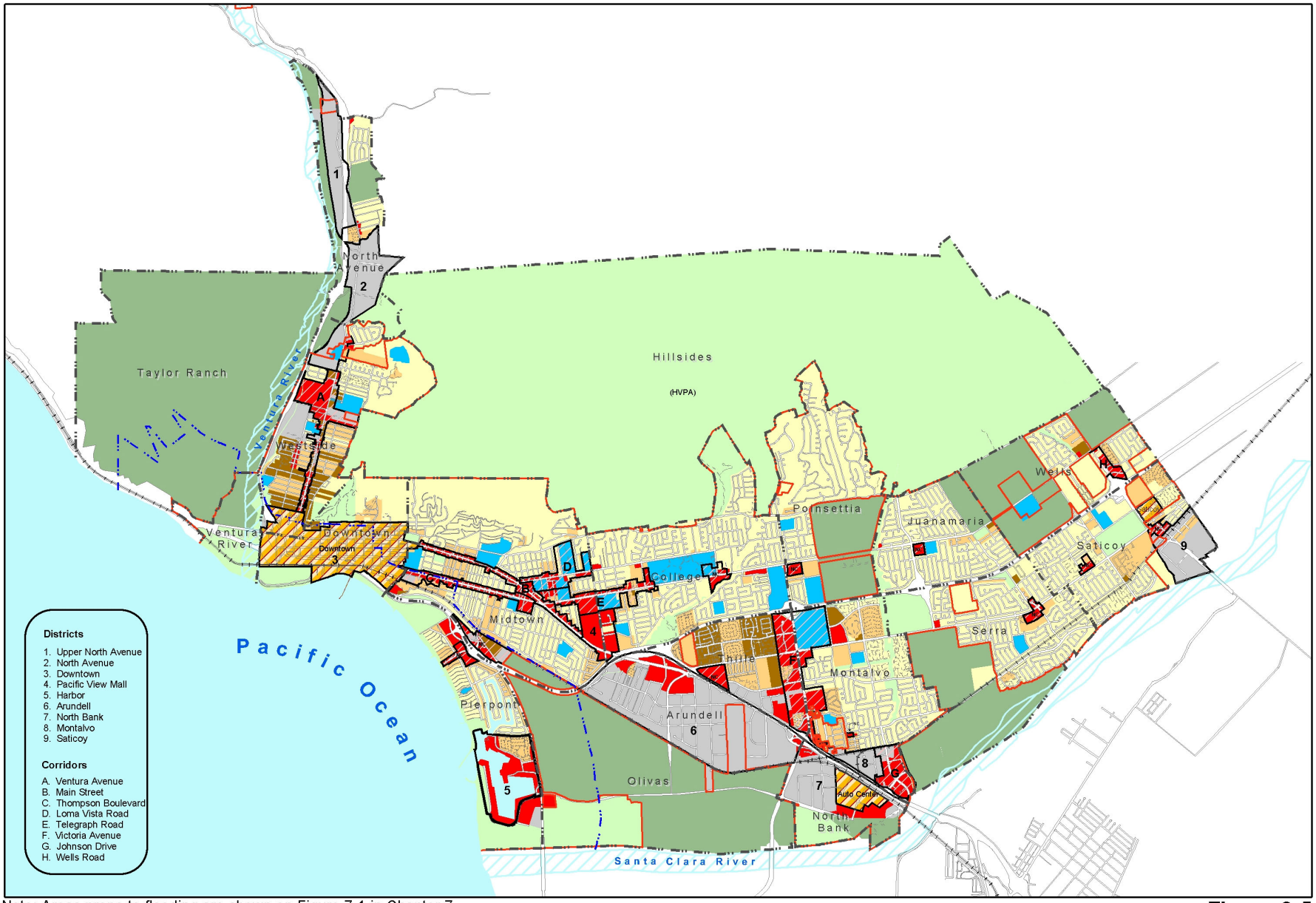
G. Johnson Drive – a connector between eastern Ventura and Highway 101 with sub-urban scale retail. Opportunities exist for high-quality, mixed-uses (such as child-care, restaurants, offices, light industrial, and housing) with ground floor commercial space to strengthen its economic presence and provide a visual gateway.

H. Wells Road – a mix of older industrial uses and newer sub-urban commercial and residential development. Well's Road should be returned to the neighborhoods it serves, so that new development can emulate the country charm that existed prior to its widening. Traffic calming in appropriate locations would encourage neighborhood connectivity, and end the current trend toward walls and buildings that turn their back to the street. This would also encourage redevelopment of the old neighborhood centers.

Neighborhood Centers

Community evolves from individual conversations and the best places to grow community are in individual neighborhoods. Every neighborhood should have at least one center where people can meet by chance at a local coffee shop, market, bookstore, diner, or even hardware store. *Our Involved Community* needs places to gather to have meaningful conversations and share civic information. Ventura's existing neighborhood centers have the opportunity to become such places. The General Plan Diagram identifies 10 neighborhood centers – where the development of housing alongside commercial uses is specifically encouraged. These centers include:

(1) Pierpont, (2) Seaward/Alessandro, (3) College/Day, (4) Gateway Plaza, (5) Victoria Plaza, (6) Bristol, (7) Kimball/Telegraph, (8) Petit/Telephone, (9) Telephone/Cachuma, and (10) Saticoy.



Note: Areas prone to flooding are shown on Figure 7-1 in Chapter 7.

Figure 3-5

GENERAL PLAN DIAGRAM

Neighborhood
- Low (up to 8 du/ac)
- Medium (9-20 du/ac)
- High (21-54 du/ac)

- Commerce
- Industry
- Public and Institutional

- Agriculture
- Parks and Open Space
- Specific Plan Area

- Corridors, Neighborhood Centers (NC)
- Districts

- City Limits
- Planning Communities
- California Coastal Zone Boundary

Special Topics

Agricultural Lands

During the 20th Century, the value of agricultural land in Ventura became secondary to that for development. However, this pattern is not irreversible, and protecting green land to save the aesthetic beauty of open space, preserve the cultural landscape of the community's heritage, and conserve land for environmental quality are high priorities in Ventura. In fact, the land's historic role for food production may soon be more highly valued once again, as prime agricultural areas continue to disappear to development at an astounding rate.

Ventura is fortunate to retain much of its rural landscape. Agriculture still plays an important role in the economy of the City and County of Ventura. Significant yields are made possible by the presence of high quality soils, adequate water supply, favorable climate, long growing season, and level topography. Mechanisms such as the California Land Conservation Act (more popularly known as the Williamson Act), the Save Our Agricultural Resources (SOAR) initiative (see Appendix B), and greenbelt agreements with neighboring jurisdictions continue to help maintain a balance between urban growth and agricultural preservation. The SOAR initiative that was adopted by the voters in 1995, and that, by its own terms, remains in full legal effect until 2030, refers to specific policies from the 1989 Comprehensive Plan that are still in effect and, as such, have been carried forward into this Plan under Policy 3D and Action 3.20 in addition to being incorporated in this General Plan as set forth in Appendix B.

A primary agricultural concern is the potential conflict with adjacent urban uses over pesticides, dust, odors, noise, and the visual impact of large greenhouses. Other issues of importance to agricultural producers include restrictions on farm-related activities, access to water, and provision of farmworker housing. Paralleling these concerns is a community interest in sustainability, the ability to provide for the needs of future generations. The policies and actions in this chapter intend to sustain viable farm operations in areas designated for agricultural use.

Growth Management

Growth management seeks to preserve public good, improve social equity, and minimize adverse impacts of development while still accommodating new housing and business attraction. The effects of growth management policies on housing prices are complex due to the idiosyncrasies of local real estate markets. Properly designed, growth management programs can plan for all development needs, such as open space, access to public transportation, and walkable neighborhoods.

The City's Residential Growth Management Program (originally established in 1979 to ensure that housing development would not outpace needed infrastructure) has not always contributed to housing affordability or quality design. This General Plan calls for revising the Residential

Subsequent to the adoption of the **SOAR** initiative, there have been two general plan amendments, which redesignated individual agricultural properties through a vote of the electorate as required by SOAR. These remain in full legal effect and have been carried forward into this Plan. These include the new Community Park at Kimball Road and the southeast corner of Montgomery and Bristol (see Appendix E and F).

Growth Management Program with an integrated set of growth management tools. Such tools not only include the adoption of a new form-based Development Code, but also community or specific plans based on availability of infrastructure and resources.

Long Term Potential Expansion Strategy

Indeed, the community has indicated that before the City expands any further, the first priority for achieving planning goals should be in the vacant and underutilized areas of the City. Yet, even the most successful effort to achieve community planning goals through infill may need to be supplemented at some point by expanding into areas outside the city limits. Such expansion may not only be necessary to fulfill development objectives; it also may be needed to provide open space, parklands, and natural areas to be preserved and restored. To address this, citizens discussed during the preparation of this General Plan which areas, if any, should be possible expansion areas. These areas were identified because they embody opportunities for achieving a variety of community vision objectives that may not be feasible within existing city limits. The community further went on to agree upon a set of rules about how these areas should be planned. These areas were analyzed in the environmental impact report prepared for this General Plan, and a "long term potential expansion strategy" will be formulated to guide the process of prioritizing any potential future expansion areas to fulfill General Plan objectives that may not be able to be achieved by our "Infill First" approach. Should any areas be selected for future planning, a specific plan, a public vote (if required pursuant to SOAR), and an amendment with the regulatory planning framework would have to occur.

The policies and actions in this chapter call for measured and appropriate growth in Ventura by prioritizing areas appropriate for additional development based on community values and infrastructure potential.

Policy 3A: Sustain and complement cherished community characteristics.

Action 3.1: Preserve the stock of existing homes by carrying out Housing Element programs.

Action 3.2: Enhance the appearance of districts, corridors, and gateways (including views from highways) through controls on building placement, design elements, and signage.

Action 3.3: Require preservation of public view sheds and solar access.

Action: 3.4 Require all shoreline development (including anti-erosion or other protective structures) to provide public access to and along the coast, unless it would duplicate adequate access existing nearby, adversely affect agriculture, or be inconsistent with public safety, military security, or protection of fragile coastal resources.

Action 3.5: Establish land development incentives to upgrade the appearance of poorly maintained or otherwise unattractive sites, and enforce existing land maintenance regulations.

Action 3.6: Expand and maintain the City's urban forest and thoroughfare landscaping, using native species, in accordance with the City's Park and Development Guidelines and Irrigation and Landscape Guidelines.

Action 3.7: Evaluate whether lot coverage standards should be changed based on neighborhood characteristics.

Policy 3B: Integrate uses in building forms that increase choice and encourage community vitality.

Action 3.8: Adopt new development code provisions that designate neighborhood centers, as depicted on the General Plan Diagram, for a mixture of residences and small-scale, local-serving businesses.

Action 3.9: Adopt new development code provisions that designate areas within districts and corridors for mixed-use development that combines businesses with housing, and focuses on the redesign of single-use shopping centers and retails parcels into walkable, well connected blocks, with a mix of building types, uses, and public and private frontages.

Action 3.10: Allow intensification of commercial areas through conversion of surface parking to building area under a district-wide parking management strategy in the Downtown Specific Plan.

Action 3.11: Expand the downtown redevelopment area to include parcels around future transit areas and along freeway frontage.

Action 3.12: The City will work with the hospitals on the new Development Code treatment for the Loma Vista corridor, which includes both hospitals.

Action 3.13: Assess whether the City's Affordable Housing Programs respond to current needs, and modify them as necessary within State mandated Housing Element updates.

Specific Plan Requirements

Specific Plans must include a statement of its relationship to the General Plan and specify all of the following:

1. distribution, location, and extent of uses
2. distribution, location, extent, and intensity of public and private transportation, sewage, water, drainage, solid waste disposal, energy
3. standards and criteria by which development will proceed and standards for conservation, development, and utilization of natural resources
4. program of implementation measures, including regulations, programs, public works projects, and financing
5. any other subjects that are necessary

(§65450-65452)

Policy 3C: Maximize use of land in the city before considering expansion.

Action 3.14: Utilize infill, to the extent possible, development to accommodate the targeted number and type of housing units described in the Housing Element.

Action 3.15: Adopt new development code provisions that ensure compliance with Housing Element objectives.

Action 3.16: Renew and modify greenbelt agreements as necessary to direct development to already urbanized areas.

Action 3.17: Continue to support the Guidelines for Orderly Development as a means of implementing the General Plan, and encourage adherence to these Guidelines by all the cities, the County of Ventura, and the Local Agency Formation Commission (LAFCO); and work with other nearby cities and agencies to avoid urban sprawl and preserve the rural character in areas outside the urban edge.

Action 3.18: Complete community or specific plans, subject to funding, for areas such as Westside, Midtown, Downtown, Wells, Saticoy, Pierpont, Harbor, Loma Vista/Medical District, Victoria Corridor, and others as appropriate. These plans will set clear development standards for public and private investments, foster neighborhood partnerships, and be updated as needed.

Action 3.19: Preparation of the new Development Code will take into account existing or proposed community or specific plans to ensure efficient use of City resources and ample citizen input.

Policy 3D: Continue to preserve agricultural and other open space lands within the City's Planning Area.

Action 3.20: Pursuant to SOAR, adopt development code provisions to "preserve agricultural and open space lands as a desirable means of shaping the City's internal and external form and size, and of serving the needs of the residents.

Action 3.21: Adopt performance standards for non-farm activities in agricultural areas that protect and support farm operations, including requiring non-farm uses to provide all appropriate buffers as determined by the Agriculture Commissioner's Office.

Action 3.22: Offer incentives for agricultural production operations to develop systems of raw product and product processing locally.

Policy 3E: Ensure the appropriateness of urban form through modified development review.

Action 3.23: Develop and adopt a form-based Development Code that emphasizes pedestrian orientation, integration of land uses, treatment of streetscapes as community living space, and environmentally sensitive building design and operation.

Action 3.24: Revise the Residential Growth Management Program (RGMP) with an integrated set of growth management tools including:

- community or specific plans and development codes based on availability of infrastructure and transit that regulate community form and character by directing new residential development to appropriate locations and in ways that integrate with and enhance existing neighborhoods, districts and corridors;
- appropriate mechanisms to ensure that new residential development produces high-quality designs and a range of housing types across all income levels; and,
- numeric limitations linked to the implementation of community or specific plans and development codes and the availability of appropriate infrastructure and resources; within those limitations, the RGMP should provide greater flexibility for timing new residential development.

Action 3.25: Establish first priority growth areas to include the districts, corridors, and neighborhood centers as identified on the General Plan Diagram; and second priority areas to include vacant undeveloped land when a community plan has been prepared for such (within the City limits).

Action 3.26: Establish and administer a system for the gradual growth of the City through identification of areas set aside for long-term preservation, for controlled growth, and for encouraged growth.

Action 3.27: Require the use of techniques such as digital simulation and modeling to assist in project review.

Action 3.28: Revise the planning processes to be more user-friendly to both applicants and neighborhood residents in order to implement City policies more efficiently.

Policies and actions related to the preservation of **historic architecture and resources** are contained in Chapter 9.

2000-2006 HOUSING ELEMENT GOALS AND POLICIES, City Council Adopted Resolution 2004-014. Adopted April 12, 2004

Goal 1

Maintain and improve the quality of existing housing and residential neighborhoods in Ventura.

Policy 1.1 Encourage citizen involvement in addressing the maintenance and improvement of the housing stock and neighborhood quality.

Policy 1.2 Continue to preserve and maintain the City's historical and architecturally significant buildings and neighborhoods.

Policy 1.3 Encourage homeowners and landlords to maintain properties in sound condition through the City's residential rehabilitation assistance programs and code enforcement efforts.

Policy 1.4 Cooperate with housing providers in the acquisition, rehabilitation, and maintenance of older residential properties as long-term affordable housing.

Policy 1.5 Permit the conversion of apartments to condominiums only when such conversion would not adversely affect the overall supply and availability of rental units, particularly units occupied by lower- and moderate-income households.

Policy 1.6 Continue to support the provision of rental assistance to lower-income households, and encourage property owners to list units with the Housing Authority.

Policy 1.7 Continue to preserve the affordability of mobile homes through the Rent Stabilization Ordinance. Support the acquisition and ownership of mobile home parks by non-profit housing providers and resident organizations.

Policy 1.8 Preserve the existing stock of affordable housing, including mobilehomes, through City regulations, as well as financial and other forms of assistance.

Goal 2

Facilitate the provision of a range of housing types to meet the diverse needs of the community.

Policy 2.1 Provide high quality housing for current and future residents with a diverse range of income levels.

Promote housing that is developed under modern sustainable community standards.

Policy 2.2 Provide expanded housing opportunities for the City's workforce. Promote the City's affordable housing programs with employers in Ventura.

Policy 2.3 Continue to offer and promote homeownership assistance programs to lower- and moderate-income households to purchase both new and existing housing. Pursue participation in other homeownership programs available in the private market.

Policy 2.4 Continue to provide financial and regulatory incentives to non-profits, private housing developers, and public agencies for the construction of the types of housing required to meet identified needs.

Policy 2.5 Support the provision of quality rental housing with three or more bedrooms to accommodate large families, and encourage room additions in the existing housing stock to address household overcrowding.

Policy 2.6 Support a variety of housing types to address the needs of agricultural workers, including affordable rentals, mobilehome parks, single room occupancy hotels (SROs), and group housing for migrant laborers.

Policy 2.7 Facilitate the provision of housing to address Ventura's growing senior population, including senior housing with supportive services, assisted living facilities, and second units.

Policy 2.8 Encourage the provision of housing adaptable to the physically disabled through integration of universal design features in new development, and compliance with Title 24 of the California Health and Safety Code.

Policy 2.9 Encourage the provision of supportive housing for persons with mental illness to address the severe shortage of housing for this special needs population.

Policy 2.10 Support efforts by non-profits to expand transitional and emergency housing in Ventura, including support of grant applications and assistance in identification of suitable sites.

Policy 2.11 Evaluate adoption of an inclusionary housing ordinance as a means of integrating affordable units within new residential development: 1) Require affordable units to be provided on or off-site, with allowance for payment of an in-lieu fee at the discretion of the City; 2) Evaluate the financial impact of inclusionary requirements on development, and assess incentive-based alternative strategies for provision of affordable housing.

Policy 2.12 Facilitate the provision of second units as a means of providing affordable rental housing in existing neighborhoods. Ensure compatibility with the primary unit and surrounding neighborhood.

Policy 2.13 Encourage the production of housing that meets the needs of all economic segments, including lower, moderate, and above moderate-income households, to achieve a balanced community.

Policy 2.14 Promote and facilitate non-traditional housing types and options, including co-housing, assisted living facilities, live-work spaces, and artist lofts.

Policy 2.15 Direct City-controlled housing funds towards programs that address the needs of very low- and low-income households.

Policy 2.16 Prioritize affordable housing opportunities and assistance for public service employees.

Policy 2.17 Annually monitor the City's progress in meeting its housing needs for all income levels.

Goal 3

Provide adequate housing sites through appropriate land use and zoning designations to accommodate the City's share of the regional housing needs.

Policy 3.1 Maintain an up-to-date inventory of vacant and underutilized parcels and provide to interested developers in conjunction with information on available development incentives. Within redevelopment project areas, provide assistance in land assembly in support of affordable housing.

Policy 3.2 Implement smart growth principles by rewarding quality infill projects that utilize existing infrastructure.

Policy 3.3 Encourage efficient utilization of the City's limited land resources by encouraging development at the upper end of the permitted Zoning Code/Comprehensive Plan density.

Policy 3.4 Utilize the Urban Infill Overlay Zone and Downtown Specific Plan as a tool to facilitate higher density residential and mixed-use development.

Policy 3.5 Explore residential reuse opportunities on obsolete commercial properties, such as older motels and underutilized historic structures.

Policy 3.6 Pursue use of publicly owned land, such as public parking lots, for development of affordable housing.

Policy 3.7 Identify opportunities for housing development that achieves other community goals such as neighborhood improvement, recreation opportunities, and the preservation of sensitive lands and neighborhood character.

Policy 3.8 Facilitate the development of mixed-use projects in appropriate commercial areas, including stand-alone residential developments (horizontal mixed-use) and housing above ground floor commercial uses (vertical mixed-use).

Policy 3.9 Promote higher density housing as part of mixed-use developments along parts of Thompson Boulevard and Main Street in Midtown Ventura, as well as other areas such as Westside, Downtown and East Ventura.

Policy 3.10 Promote mixed-use developments on the Westside of Ventura.

Policy 3.11 Ensure that the updated Land Use Element designates adequate sites for housing for executives to enhance the City's ability to attract businesses with higher paying jobs.

Goal 4

Mitigate or remove any potential governmental constraints to housing production and affordability.

Policy 4.1 Provide regulatory and/or financial incentives, where appropriate, to offset or reduce the costs of affordable housing development, including density bonuses and flexibility in site development standards.

Policy 4.2 Utilize the Affordable Housing Program to provide incentives for production of affordable units, including streamlined permit processing, reduced fees and exemption from the required competition for RGMP allocations.

Policy 4.3 Amend the City's Residential Growth Management Plan (RGMP) to better facilitate housing production, while discouraging sprawl and maintaining quality of life goals.

Policy 4.4 Undertake a comprehensive review of the City's residential development project review procedures and establish modified procedures as appropriate to streamline processing times, while maintaining adequate levels of public review.

Policy 4.5 Provide flexibility in development standards to accommodate new models and approaches to providing affordable housing, such as co-housing, live/work units and assisted living facilities.

Goal 5

Promote equal opportunity for all residents to reside in the housing of their choice.

Policy 5.1 Continue to enforce fair housing laws prohibiting arbitrary discrimination in the building, financing, selling or renting of housing on the basis of race, religion, family status, national origin, physical or mental disability, or other such factors.

Policy 5.2 Continue to support organizations that offer fair housing and mediation services to Ventura residents.

Policy 5.3 Promote housing that meets the special needs of large families, elderly persons, agricultural workers, and the disabled.

Policy 5.4 Continue to enforce notification and provide relocation assistance for lower-income persons displaced due to demolition, reuse, condominium conversion, or rehabilitation as a result of code enforcement.

ventura's general plan

OUR ACCESSIBLE COMMUNITY

"Restore human legs as a means of travel. Pedestrians rely on food for fuel and need no special parking facilities."

— Lewis Mumford
Author of *The City in History*, 1961

CITY OF
VENTURA

4. OUR ACCESSIBLE COMMUNITY

Our goal is to provide residents with more transportation choices by strengthening and balancing bicycle, pedestrian and transit opportunities in the City and surrounding region.

An Integrated Mobility System

Central to the well-being of Ventura's citizens and visitors is *mobility*, the ability to get from one place to another. Mobility depends on the range, efficiency, and connectivity of the various components that comprise the transportation network – sidewalks, bicycle routes, and thoroughfares, as well as transit services – and that enable people to access the things they need, from the most basic to the extraordinary (See Figures 4-1 Bicycle Facilities, 4-2 Bus and Rail Routes, and 4-3 Roadway Classification Plan). Ventura is a community that recognizes that thoroughfares serve a variety of functions and are not simply conduits for automobile traffic.

Balancing automobile use with other means of travel is essential to maintaining social and physical health. Safe and enjoyable routes for pedestrians and bicyclists should connect every part of the city, and neighborhoods need to be linked by ample and convenient transit service along corridors. Ventura also must be connected to the larger region by a variety of transportation modes.

Thoroughfares have a tremendous effect on neighborhood character and therefore quality of life for both residents and visitors.

Thoroughfares are essentially the stage of public life where a diversity of citizens interact. They can create places of remembrance, chance encounters, and discovery. Ensuring that Ventura thoroughfares are *great places* requires improving design and quality as well as connectivity. In some cases, city thoroughfares are over-engineered to accommodate the worst-case scenario.

Slowing down automobiles, especially in residential neighborhoods, is a desire shared by many residents. Vehicle travel should be directed toward routes that minimize congestion, avoid conflicts with walkers and bicyclists, and keep residential neighborhoods free of excessive cut-through traffic. Additionally, in some areas of the city, suburban patterns have resulted in less connectivity than is desired by the community. Transportation modes and land uses in the city need to be distributed so that residents have close and easy access to meet their basic needs and travel destinations.

Traffic congestion is a major concern among Ventura residents. Although traffic on local roads is generally free-flowing, a few key intersections and road segments experience congestion during peak traffic hours. Simply widening roads to add lanes will not solve traffic congestion. Instead, the system needs integrated solutions that improve mobility for all

The essential qualities of a properly functioning mobility system are:

1. Well connected, interesting components
2. Convenient accessibility
3. Integrated linkage of all modes
4. Comfort and safety
5. Design reflecting natural and urban context

means of travel. While walking, biking, and transit use are already popular, these alternative modes need to be enhanced and better linked. For example, bus and rail systems serve Ventura, but not thoroughly enough to provide a reasonable alternative to auto use for most travelers. And while pedestrian access exists in most areas of Ventura, the network lacks continuous routes in some key locations.

As expressed in the *Ventura Vision,* a top community priority is to minimize automobile use through a fully integrated multi-modal transportation system. The policies and actions in this chapter aim to achieve this objective.

Travel Modes

Walking

Sidewalks are arguably the most important component of the city's mobility system. As with circulation in general, the utility of pedestrian systems is inextricably linked to land use patterns. Combined with urban design elements, land use patterns influence how much walking can safely and effectively occur in the community. Circulation systems that are designed with pedestrians in mind tend to increase outdoor activity and community interaction, while those oriented toward motor vehicles tend to create disincentives to walking.

Ventura's pedestrian system consists of sidewalks, access ramps, crosswalks, linear park paths, and overpasses and tunnels. Special corridors such as the Beachfront Promenade, California Plaza, and Figueroa Plaza have been designated especially for pedestrians. The pedestrian system also includes neighborhood and park path systems, and dedicated trail facilities that are shared with bicyclists and other users.

Pedestrian paths need to be interesting, enjoyable, and lead to a destination, from the most simple – such as a pocket park – to more grand points of arrival, such as major civic spaces. Creating a network of paths that connect key features such as parks, schools, civic facilities, shops, and services is vital to the success of reducing dependence on the automobile. Those most in need of pedestrian access include children, teenagers, and the elderly, as well as those who cannot afford a car or choose not to drive.

The main deficiency of Ventura's pedestrian system is its discontinuity. Some sections of thoroughfares lack sidewalks, and pedestrian connections between some key use areas are in need of repair. Crosswalks are prohibited along some corridors, and pedestrian signal phases are not always long enough for all walkers. Traffic-calming measures also are needed to improve walkability in many neighborhoods. Citizens have placed a high emphasis on improving the pedestrian network, recommending specific improvements such as:

- narrowing selected thoroughfare segments,
- improving sidewalks and road crossings,
- lengthening pedestrian signal phases,
- adding marked crossings at key intersections,
- developing safe and attractive walkways from Downtown and Midtown to the beach,
- ensuring that new development provides ample pedestrian access,
- creating trails along watercourses and through the hillsides, and
- improving pedestrian facilities near schools.

Figure 4-1 illustrates the three State defined classes of bikeway facilities:

- Bike Path (Class I) – Class I bike paths are separated from roads by distance or barriers, and cross-traffic by motor vehicles is minimized.
- Bike Lane (Class II) – Class II bikeways are roadway lanes reserved for bicycles. These lanes are painted with pavement lines and markings and are signed.
- Bike Route (Class III) – Class III bike routes share existing roads and provide continuity to other bikeways or designated preferred routes through high traffic areas. There are no separate lanes, and bike routes are established by placing signs that direct cyclists and warn drivers of the presence of bicyclists.

Policies and actions in this chapter intend to improve pedestrian access through this range of methods.

Biking

Because bicycles are an integral component of the city's mobility system, they are allowed on *all* city thoroughfares. The City has adopted a General Bikeway Plan intended to create a safe, accessible, and interconnected network of bike paths, lanes, and routes that will ensure Ventura becomes and remains a truly bicycle-friendly community. The General Bikeway Plan is a flexible, comprehensive, and long-range guide for bicycle transportation and recreation planning, design, and budget decision-making. Accordingly, it is designed to:

- refine and implement City bicycle-related policies,
- establish bikeway design standards,
- enhance bicycle safety and education programs,
- set priorities and phasing for improvements and amenities depicted on the Select System of Bikeways map, and
- identify funding means and opportunities for interagency cooperation.

The City places high emphasis on improving the local bicycle network by following the recommendations of the General Bikeway Plan, which include:

- connecting schools, parks, activity areas, housing areas, and employment centers with bike paths and lanes, particularly in areas without thoroughfares,
- constructing additional Class I or Class II bikeways in a number of locations, including along the Santa Clara River and the coast to connect to the Ventura River Trail,
- installing bicycle racks,
- updating bicycle facility standards to ensure proper design and maintenance,
- constructing improvements to resolve bicycle/automobile conflicts,
- establishing a highly visible route identification and signage program that fits the character of the community, and
- mitigating impacts on bicyclists from new development and during and following construction of roadway projects.

Policies and actions in this chapter seek to improve bicycle access and safety by carrying out these recommendations.

Public Transit – Bus & Rail

Transit service in Ventura includes bus and rail operations (see Figure 4-2). South Coast Area Transit (SCAT) provides local bus service, Ventura Intercity Transit Authority (VISTA) runs regional routes, and Greyhound offers statewide and national connections. Metrolink provides rail service to and from Los Angeles – although on a very limited schedule, while Amtrak trains that stop in Ventura run between San Luis Obispo and San Diego.

Although local bus routes connect most activity centers, the East End is not well served, and more frequent service is needed to key destinations such as the beach and downtown. Metrolink and Amtrak need to be linked to each other and accessed by local bus routes. An agreement between the City and the Ventura County Transportation Commission calls for identifying a permanent Metrolink site, and the best way to integrate all of these services is with a major multi-modal transit center that also accommodates potential additional future alternative transportation modes.

SCAT buses are equipped with wheelchair lifts and adjustable steps to ensure access for all riders. SCAT also offers discounted fares for seniors and disabled riders, as well as dial-a-ride service. However, seniors and mobility-impaired persons also desire frequent fixed-route service in smaller vehicles, and all riders need upgraded amenities at a number of stops. Bus routes also need increased frequency and stops to make transit a viable alternative to driving.

Other transit system needs include:

- reduced-emission vehicles,
- continued use of schedule synchronization to accommodate route transfers, and
- service to regional destinations such as California State University Channel Islands and airports.

Policies and actions in this Chapter aim to improve transit efficiency, encourage ridesharing, and preserve long-term transit options.

The Automobile and Types of Roadways

The most basic component of the mobility system is the *thoroughfare*, used not only by people who drive, but also by people who ride the bus, bike and walk. Thoroughfares encompass sidewalks, bicycle lanes, travel lanes, and are the most utilized means of travel in Ventura. This system is organized into the following classifications: local thoroughfares, collectors, and arterials (see Figure 4-3, Roadway Classification Plan – also known as "Circulation Plan").

Local Thoroughfares

Local thoroughfares provide mobility within neighborhoods and are generally not shown on the Roadway Classification Plan. Local thoroughfares include *alleys, lanes,* and *"yield" streets*.

Collectors

Collectors serve as links between local thoroughfares. Collectors may front residential and neighborhood-serving commercial uses. Collectors can be configured as *boulevards, avenues, streets,* and *main streets*.

Arterials

Arterials are the primary mechanism for cross-town travel and serve the major centers of activity. These roads typically carry a high proportion of the total urban area travel. Arterials can be configured as *boulevards, avenues,* and *streets*.

Collector and arterial thoroughfare segments in the City are characterized in two ways that describe their physical features: *design* classification and *functional* classification. Design Classification defines the number of travel *lanes* using the following categories: Primary Arterial (6 lanes or more), Secondary Arterial (4 lanes), and Collector (2 lanes), as shown on the Roadway Classification Plan, Figure 4-3. Functional Classification describes how a thoroughfare is used: essentially as a *boulevard*, *avenue*, *street*, or *main street*.

Functional Classification also identifies whether roadways have medians, parking, bike lanes, and other streetscape attributes needed to achieve objectives other than just moving traffic, such as accommodating pedestrians, bicycles, and adjoining land uses and public spaces. Table 4-1 shows the design and functional classifications for thoroughfares in the City.

Ventura is mainly connected by 2-lane and 4-lane thoroughfares. The classification for each type of road segment represents a balance between vehicle capacity, pedestrian and bicycle access, parking requirements, streetscape character, and right-of-way limitations.

Boulevard
A multi-lane and generally urban corridor with a central, planted median.

Avenue
Avenues are typically multi-lane, short distance connectors, with a painted median, used in both residential and commercial areas, and often terminate at prominent buildings or plazas.

Table 4-1 Thoroughfare Sizes and Types

	Street Sizes (Engineering Design Classification)		
	Primary Arterial (6 or more lane roadway)	Secondary Arterial (4 lane roadway)	Collector (2 lane roadway)
Existing			
Future Widening			
Future Extension			
	Thoroughfare Types (Functional Classification)		
	Boulevard	Boulevard	Boulevard
	Avenue	Avenue	Avenue
		Street	Street
			Main Street

Source: Definitions for Design Classifications are the City's modifications to the American Association of State Highway and Transportation Officials (AASHTO) standards. Definitions for Functional Classifications are the City's modifications to the Traditional Neighborhood Development Street Design Guidelines.

Street
Street typically allows two way travel and may be multi-lane and does not have a central median and generally provides access to predominantly residential areas.

Main Street

Main streets have 2 vehicle lanes. Their main purpose is to provide low-speed access to commercial, mixed-uses, and higher density neighborhoods.

Consistency between the design and functional classifications is determined based on the number of through lanes. Temporary improvements, such as restriping to change the number of lanes are allowed, however a permanent improvement that moves the curbs and changes the number of lanes would require an amendment to this plan.

The *Ventura Vision* offers several key recommendations to improve the city thoroughfare system:

- add or enhance north-south arterials;
- consider an additional Santa Clara River bridge, Portola Avenue overcrossing of U.S. 101, and Johnson Drive overcrossing of Route 126; and
- soften the barrier impact of U.S. 101 by working with Caltrans to improve signage, aesthetics, undercrossings, and overcrossings.

Policies, actions, and the Roadway Classification Plan work together to address these recommendations. To improve the safety and functioning of the thoroughfare network and to maintain its compatibility with the character of the community, the policies and actions in this chapter also call for upgrading problem thoroughfares and intersections, improving and constructing freeway ramps, and connecting unfinished roadways. Additional actions intend to protect views from scenic routes, including State-designated scenic highways.

Policy 4A: Ensure that the transportation system is safe and easily accessible to all travelers.

Action 4.1: Direct city transportation investment to efforts that improve user safety and keep the circulation system structurally sound and adequately maintained. First priority for capital funding will go to our pavement management program to return Ventura streets to excellent condition.

Action 4.2: Develop a prioritized list of projects needed to improve safety for all travel modes and provide needed connections and multiple route options.

Action 4.3: Provide transportation services that meet the special mobility needs of the community including youth, elderly, and disabled persons.

Action 4.4: Combine education with enforcement to instill safe and courteous use of the shared public roadway.

Action 4.5: Utilize existing roadways to meet mobility needs, and only consider additional travel lanes when other alternatives are not feasible.

Action 4.6: Require new development to be designed with interconnected transportation modes and routes to complete a grid network.

Action 4.7: Update the traffic mitigation fee program to fund necessary citywide circulation system and mobility improvements needed in conjunction with new development.

Action 4.8: Implement the City's Neighborhood Traffic Management Program and update as necessary to improve livability in residential areas.

Action 4.9: Identify, designate, and enforce truck routes to minimize the impact of truck traffic on residential neighborhoods.

Action 4.10: Modify traffic signal timing to ensure safety and minimize delay for all users.

Action 4.11: Refine level of service standards to encourage use of alternative modes of transportation while meeting state and regional mandates.

Action 4.12: Design roadway improvements and facility modifications to minimize the potential for conflict between pedestrians, bicycles, and automobiles.

Action 4.13: Require project proponents to analyze traffic impacts and provide adequate mitigation in the form of needed improvements, in-lieu fee, or a combination thereof.

Policy 4B: Help reduce dependence on the automobile.

Action 4.14: Provide development incentives to encourage projects that reduce automobile trips.

Action 4.15: Encourage the placement of facilities that house or serve elderly, disabled, or socioeconomically disadvantaged persons in areas with existing public transportation services and pedestrian and bicycle amenities.

Action 4.16: Install roadway, transit, and alternative transportation improvements along existing or planned multi-modal corridors, including primary bike and transit routes, and at land use intensity nodes.

Action 4.17: Prepare and periodically update a Mobility Plan that integrates a variety of travel alternatives to minimize reliance on any single mode.

Action 4.18: Promote the development and use of recreational trails as transportation routes to connect housing with services, entertainment, and employment.

Action 4.19: Adopt new development code provisions that establish vehicle trip reduction requirements for all development.

Action 4.20: Develop a transportation demand management program to shift travel behavior toward alternative modes and services.

Action 4.21: Require new development to provide pedestrian and bicycle access and facilities as appropriate, including connected paths along the shoreline and watercourses.

Action 4.22: Update the General Bikeway Plan as needed to encourage bicycle use as a viable transportation alternative to the automobile and include the bikeway plan as part of a new Mobility Plan.

Action 4.23: Upgrade and add bicycle lanes when conducting roadway maintenance as feasible.

Action 4.24: Require sidewalks wide enough to encourage walking that include ramps and other features needed to ensure access for mobility-impaired persons.

Action 4:25: Adopt new development code provisions that require the construction of sidewalks in all future projects.

Action 4.26: Establish a parking management program to protect the livability of residential neighborhoods, as needed.

Action 4.27: Extend stubbed-end streets through future developments, where appropriate, to provide necessary circulation within a developing area and for adequate internal circulation within and between neighborhoods. Require new developments in the North Avenue area, where applicable, to extend Norway Drive and Floral Drive to connect to Canada Larga Road; and connect the existing segments of Floral Drive. Designate

the extension of Cedar Street between Warner Street and south of Franklin Lane and the linking of the Cameron Street segments in the Westside community as high priority projects.

Policy 4C: Increase transit efficiency and options.

Action 4.28: Require all new development to provide for citywide improvements to transit stops that have sufficient quality and amenities, including shelters and benches, to encourage ridership.

Action 4.29: Develop incentives to encourage City employees and local employers to use transit, rideshare, walk, or bike.

Action 4.30: Work with public transit agencies to provide information to riders at transit stops, libraries, lodging, and event facilities.

Action 4.31: Work with public and private transit providers to enhance public transit service.

Action 4.32: Coordinate with public transit systems for the provision of additional routes as demand and funding allow.

Action 4.33: Work with Amtrak, Metrolink, and Union Pacific to maximize efficiency of passenger and freight rail service to the City and to integrate and coordinate passenger rail service with other transportation modes.

Action 4.34: Lobby for additional transportation funding and changes to Federal, State, and regional transportation policy that support local decision-making.

Action 4.35: The City shall pursue funding and site location for a multi-modal transit facility in coordination with VCTC, SCAT, U.P.R.R., Metrolink, Greyhound Bus Lines, and other forms of transportation.

Policy 4D: Protect views along scenic routes.

Action 4.36: Require development along the following roadways – including noise mitigation, landscaping, and advertising – to respect and preserve views of the community and its natural context.

- State Route 33
- U.S. HWY 101
- Anchors Way
- Brakey Road
- Fairgrounds Loop
- Ferro Drive
- Figueroa Street
- Harbor Boulevard
- Main Street
- Navigator Drive
- North Bank Drive
- Poli Street/Foothill Road
- Olivas Park Drive
- Schooner Drive
- Spinnaker Drive
- Summit Drive

- Telegraph Road – east of Victoria Avenue
- Victoria Avenue – south of U.S. 101
- Wells Road

Action 4.37: Request that State Route 126 and 33, and U.S. HWY 101 be designated as State Scenic Highways.

Action 4.38: Continue to work with Caltrans to soften the barrier impact of U.S. HWY 101 by improving signage, aesthetics and undercrossings and overcrossings. 

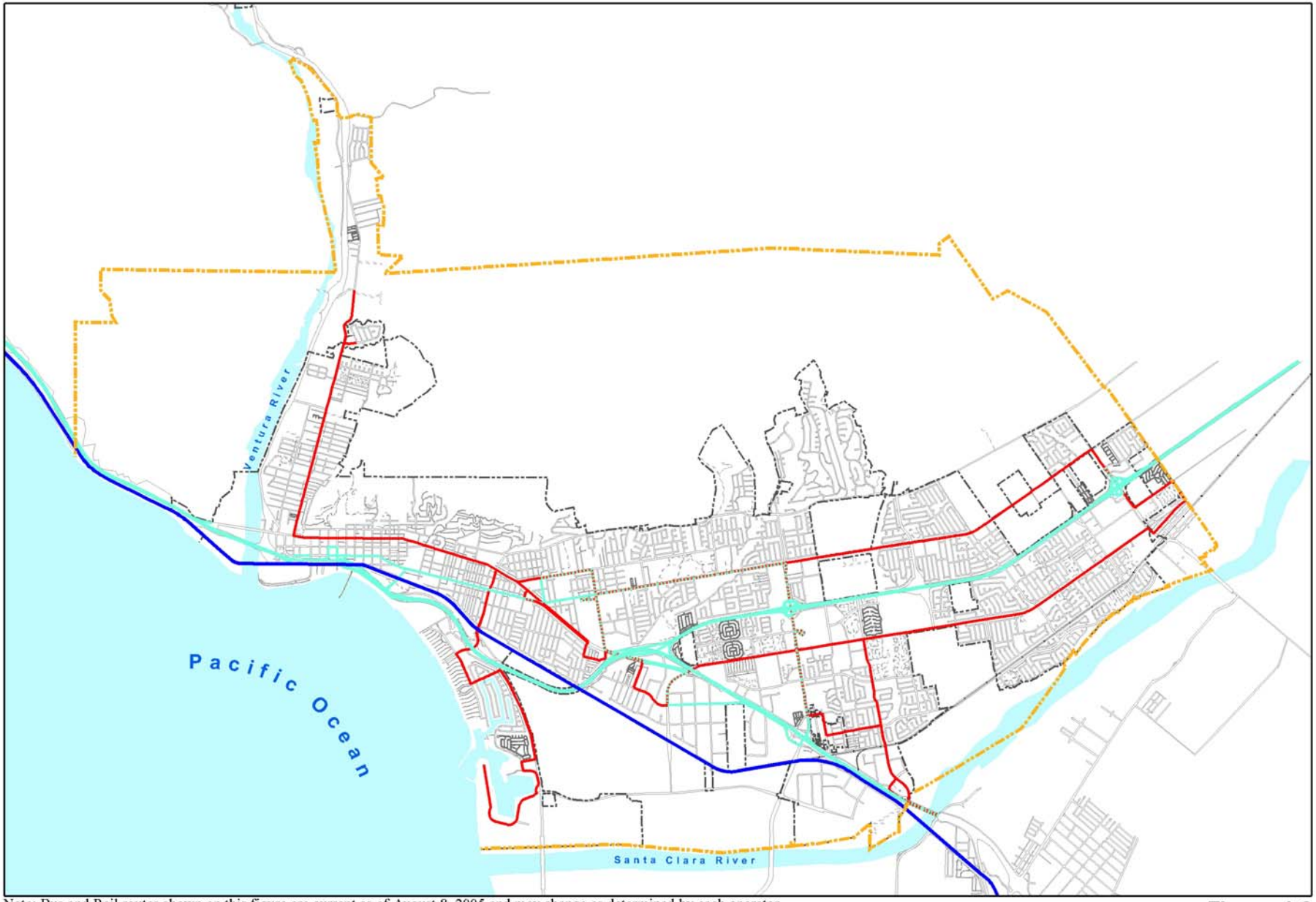
Action 4.39: Maintain street trees along scenic thoroughfares, and replace unhealthy or missing trees along arterials and collectors throughout the City. 

Note: Bike facilities shown on this figure are taken from the 1999 General Bikeway Plan and may change as updates to the General Bikeway Plan are completed.

Figure 4-1
Bicycle Facilities

	Class 1	Class 2	Class 3	Shoulder
Existing	———	———	———	———
Future	• • • • •	• • • • •	• • • • •	
Existing Sidewalk			———	

Other
- City Limits
- Planning Boundary

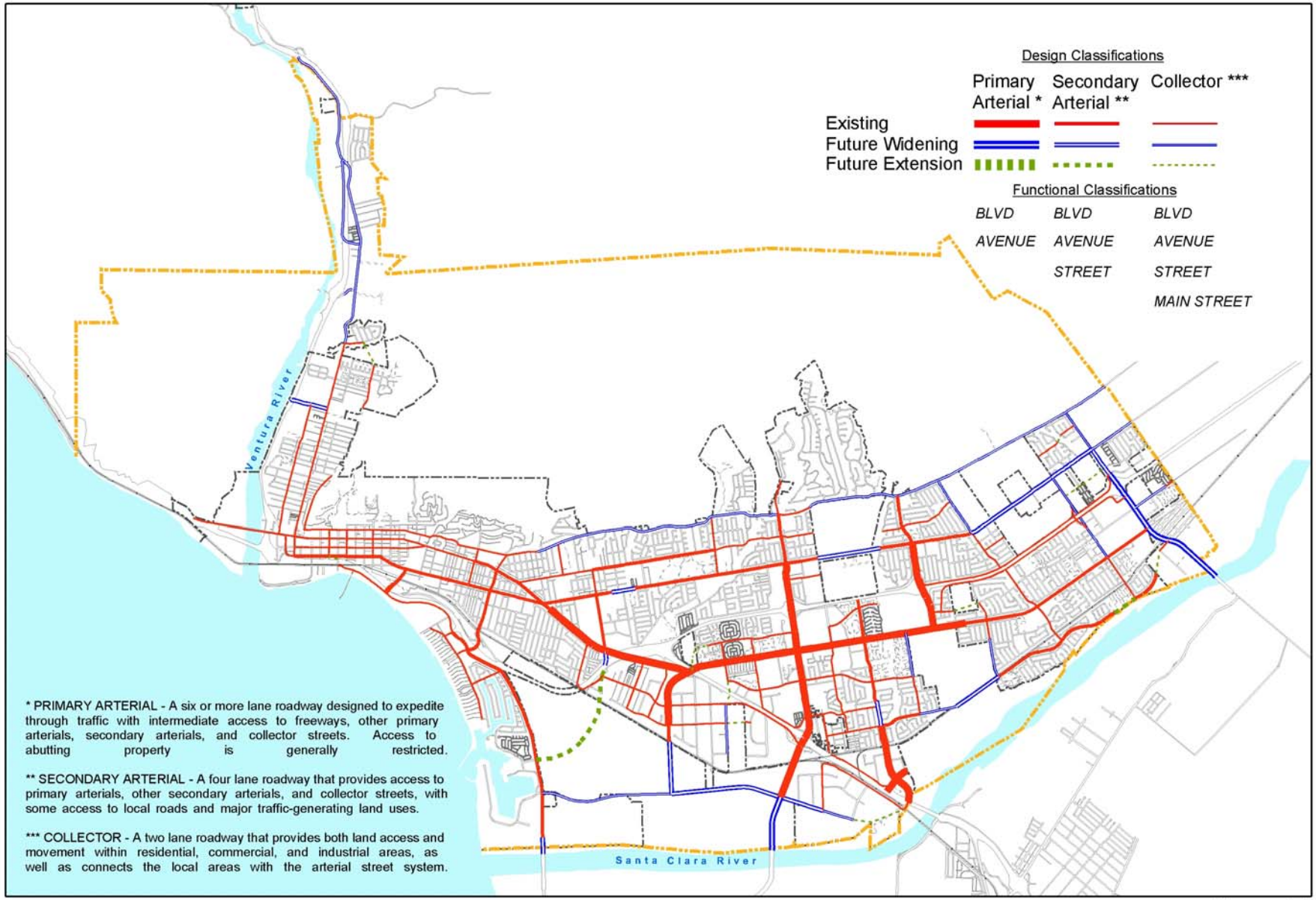


Note: Bus and Rail routes shown on this figure are current as of August 8, 2005 and may change as determined by each operator.

Figure 4-2
Bus and Rail Routes

Routes
- SCAT
- VISTA
- SCAT & VISTA
- RAIL

Other
- City Limits
- Planning Boundary

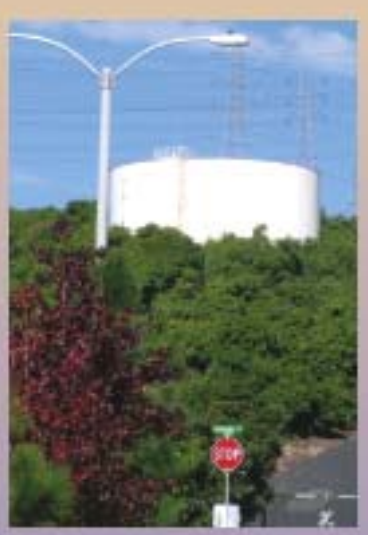


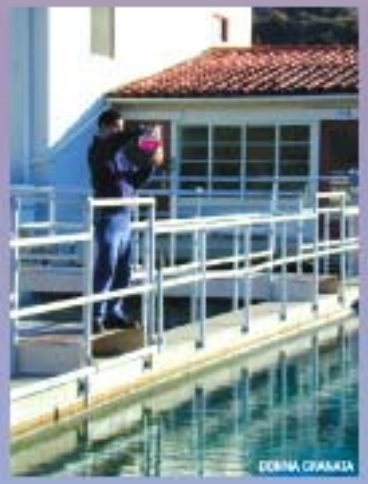
Note: Future extensions shown are conceptual in nature, unless a specific alignment has been approved by the City Council.

Figure 4-3
Roadway Classification Plan

ventura's general plan

OUR SUSTAINABLE INFRASTRUCTURE





"Now, I truly believe, that we in this generation, must come to terms with nature, and I think we're challenged as mankind has never been challenged before to prove our maturity and our mastery, not of nature, but of ourselves."

— Rachel Carson
Biologist, Writer; Ecologist 1907-1964

CITY OF
VENTURA

5. OUR SUSTAINABLE INFRASTRUCTURE

Our goal is to safeguard public health, well-being and prosperity by providing and maintaining facilities that enable the community to live in balance with natural systems.

Essential Support Systems

Infrastructure is an extremely important though largely unnoticed foundation of quality of life in Ventura. Efficient water supply, wastewater treatment, and drainage systems are vital to most daily activities. These facilities on which the community depends need regular maintenance, and they frequently require upgrading both to meet the demands of a growing population and to be sensitive to environmental resources.

To ensure that citizens get high-quality drinking water, the City owns and operates a State-certified laboratory where water quality is tested continuously. Each City treatment plant is also run by State-certified operators who monitor water quality. As a result, City water exceeds State and federal water quality requirements.

The City employs conservation measures and emerging technology in its effort to achieve a high standard for wastewater treatment while protecting natural systems. As a result, treatment capability historically has outpaced community needs, with even peak flows typically reaching only 75 percent of plant capacity. Even so, further expanding the use of reclaimed water and reducing water consumption will be vital to maintaining long-term water supplies.

Much of the storm drain system is aging and in need of repair or replacement, especially corrugated metal pipes in some of the older areas of Ventura. Collecting adequate fees that truly reflect the cost of serving development can help support City efforts to preclude additional deficiencies, and relying on and complementing natural drainage features can both help avoid the need for expensive and environmentally damaging channelization and improve the functioning of the overall drainage system.

Water Supply

The City provides drinking water, and water for fire protection, to households and businesses in Ventura through a complex system with more than 500 miles of distribution mains, 3 water treatment plants, 22 booster pump stations, 25 treated water reservoirs, and 13 wells. Five distinct sources provide surface and ground water to the City supply system:

- Casitas Municipal Water District
- Ventura River surface water intake, subsurface water and wells (Foster Park)
- Mound groundwater basin
- Oxnard Plain groundwater basin (Fox Canyon Aquifer)
- Santa Paula groundwater basin

The City also holds a State Water Project entitlement of 10,000 acre-feet per year;

however, new facilities would need to be constructed to transport this water to the City. The City updates its Urban Water Management Plan every two years (instead of every five years as required by State law) as part of its ongoing effort to ensure that City-managed water supplies will continue to accommodate demand in Ventura.

Meeting future water demands requires saving and reusing every drop possible. The City utilizes recycled water from its reclamation facility (a tertiary wastewater treatment plant) near the Harbor to augment the municipal water supply. Recycled water is used to irrigate City and private landscaping in the area and the Buenaventura and Olivas Park municipal golf courses. The remaining effluent is discharged to the Santa Clara River Estuary.

Largely as a result of conservation efforts, water consumption per city resident has generally declined (see Table 5-1). Projections anticipate that the City will continue to be able to meet consumer needs. Policies and actions in this chapter seek to refine demand management practices and conservation programs to further reduce per capita water use so that Ventura can sustain water resources for many more generations.

Table 5-1
Historic and Projected Water Production (Acre Feet)

Year	Estimated Population Served	Per Capita Use[1]	Treated Water Production	Raw Water Production	Total Water Production
Historic					
1980	73,774	0.236	17,381	4,766	22,147
1990	94,856	0.177	16,831	2,317	19,148
1995	99,668	0.165	16,428	1,602	18,030
1996	100,482	0.180	18,038	1,500	19,538
1997	101,096	0.178	18,002	1,829	19,831
1998	101,610	0.165	16,775	1,769	18,544
1999	102,224	0.192	19,658	1,067	20,725
2000	103,238	0.198	20,437	1,129	21,566
2001	104,153	0.173	18,071	889	18,960
2002	105,267	0.180	18,965	968	19,933
2003	106,782	0.183	19,510	846	20,356
Projected					
2005	109,465	0.179	19,594	1,000	20,594
2010	115,774	0.179	20,724	1,000	21,724
2015	122,447	0.179	21,918	1,000	22,918
2020	129,504	0.179	23,181	1,000	24,181

Sources: City of Ventura Urban Water Management Plan, Dec. 2000, City of Ventura 2004 Biennial Water Supply Report, as amended, September 2004.

[1] Per Capita use excludes raw water.

Wastewater Treatment

Ventura residents generate millions of gallons of wastewater each day, which is carried by more than 450 miles of sewer mains and 12 lift stations to the water reclamation facility in the Harbor area near the mouth of the Santa Clara River. While most residents receive sewer service directly from the City, three other sanitary sewer agencies with their own treatment facilities provide service to some citizens in the Montalvo, Saticoy, and North Ventura Avenue areas. As shown in Table 5-2, all local treatment facilities operate well below capacity.

Table 5-2 Treatment Facilities

Treatment Facilities	Treatment Type	Capacity	Average Daily Flow
Ventura Water Reclamation Facility	Tertiary	14 MGD	9.0 MGD (68% capacity)
Montalvo Municipal Improvement District Treatment Plant	Secondary	0.36 MGD	0.242 MGD (67% capacity)
Saticoy Sanitary District Treatment Plant	Secondary[2]	0.25 MGD	0.16 MGD (64% capacity)
Ojai Valley Sanitary District Treatment Plant	Tertiary	3 MGD	2.0 MGD (71% capacity)

[2] Includes nutrient removal prior to percolation.
Source: Individual agencies listed

About two-thirds of the wastewater treated locally is discharged to the Santa Clara River Estuary, as allowed by the Regional Water Quality Control Board. The remaining effluent is either transferred to recycling ponds, where some is delivered as reclaimed water, or it percolates to underground aquifers or evaporates. The policies and actions in this chapter call for improving treatment system efficiency to reclaim and reuse as much water as possible.

Storm Drainage

Storm runoff travels from the hills above Ventura through the City until it is absorbed into the ground or reaches the Ventura River, the Santa Clara River, or the Pacific Ocean. To convey the occasional high flows associated with storms, the Ventura County Flood Control District oversees about 20 natural or concrete lined barrancas that serve as the major drainage courses for local watersheds. The City has about 20 miles of off-street drain system designed to convey runoff from all but the most severe of storms, in which case water also runs off via city streets.

Maintaining the barrancas and other watercourses that are not already lined with concrete as natural flood channels can help reduce peak flows by limiting water velocity. Incorporating natural features into drainage systems rather than hard treatment devices also can improve water quality and reduce maintenance costs. The policies and actions in this chapter seek to prevent increases in future storm water impacts by incorporating natural drainage and flood control features such as wildlife ponds and wetlands – instead of cement retention basins – into the storm drain system where possible. Such less intensive approaches not only cost less, but they also preserve environmental resources and protect water quality.

Policy 5A: Follow an approach that contributes to resource conservation.

Action 5.1: Require low flow fixtures, leak repair, and drought tolerant landscaping (native species if possible), plus emerging water conservation techniques, such as reclamation, as they become available.

Action 5.2: Use natural features such as bioswales, wildlife ponds, and wetlands for flood control and water quality treatment when feasible.

Action 5.3: Demonstrate low water use techniques at community gardens and city-owned facilities.

Action 5.4: Update the Urban Water Management plan as necessary in compliance with the State 1983 Urban Water Management Planning Act.

Action 5.5: Provide incentives for new residences and businesses to incorporate recycling and waste diversion practices, pursuant to guidelines provided by the Environmental Services Office.

Policy 5B: Improve services in ways that respect and even benefit the environment.

Action 5.6: Require project proponents to conduct sewer collection system analyses to determine if downstream facilities are adequate to handle the proposed development.

Action 5.7: Require project proponents to conduct evaluations of the existing water distribution system, pump station, and storage requirements in order to determine if there are any system deficiencies or needed improvements for the proposed development.

Action 5.8: Locate new development in or close to developed areas with adequate public services, where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.

Action 5.9: Update development fee and assessment district requirements as appropriate to cover the true costs associated with development.

Action 5.10: Utilize existing waste source reduction requirements, and continue to expand and improve composting and recycling options.

Action 5.11: Increase emergency water supply capacity through cooperative tie-ins with neighboring suppliers.

Action 5.12: Apply new technologies to increase the efficiency of the wastewater treatment system.

Action 5.13: Increase frequency of city street sweeping, and post schedules at key points within each neighborhood.

Action 5.14: Develop a financing program for the replacement of failing corrugated metal storm drain pipes in the City.

Action 5.15: Establish assessment districts or other financing mechanisms to address storm drain system deficiencies in areas where new development is anticipated and deficiencies exist.

Action 5.16: Require new developments to incorporate stormwater treatment practices that allow percolation to the underlying aquifer and minimize offsite surface runoff utilizing methods such as pervious paving material for parking and other paved areas to facilitate rainwater percolation and retention/detention basins that limit runoff to pre-development levels.

Action 5.17: Require stormwater treatment measures within new development to reduce the amount of urban pollutant runoff in the Ventura and Santa Clara Rivers and other watercourses.

Action 5.18: Work with the Ventura Regional Sanitation District and the County to expand the capacity of existing landfills, site new landfills, and/or develop alternative means of disposal that will provide sufficient capacity for solid waste generated in the City.

"Leave all the afternoon for exercise and recreation, which are as necessary as reading. I will rather say more necessary because health is worth more than learning."

— Thomas Jefferson
3rd President of the United States
1801-1809

CITY OF
VENTURA

OUR ACTIVE COMMUNITY

ventura's general plan

6. OUR ACTIVE COMMUNITY

Our goal is to add to and enhance our parks and open spaces to provide enriching recreation options for the entire community.

Higher Standards

For many people, spending time outdoors and participating in recreational activities represent some of life's most cherished rewards. Ventura's superb public park, open space, and recreation system offers a myriad of ways to partake in these privileges. The city offers 34 developed parks, 45 miles of linear park and trail network, stellar beaches, specialized play and sports facilities and programs, communitywide events, senior and youth activities, and two 18-hole tournament class public golf courses. Figure 6-1 at the end of this chapter shows the locations of various public facilities in the city.

The City is committed to ensuring that its citizens have ample access to high quality spaces for leisure and active recreation. The City's adopted standard of 10 acres per 1,000 residents has created far more park area than would be possible under the basic State level of 3 acres per 1,000, and also tops the more ambitious National Park and Recreation Association benchmarks for specific park types (see Table 6-1). The City continues to create customized facilities like the Community Park (approved by the voters pursuant to SOAR) to expand opportunities for local residents to enjoy healthy, active lifestyles.

Table 6-1 Park Acreage per 1,000 Population

Park Type	Standards	
	City of Ventura	National Park & Recreation Association
Neighborhood	2 acres	1.5 acres
Community	3 acres	2.5 acres
Citywide	5 acres	5 acres
Total	10 acres	9 acres

Sources: City of Ventura, www.nrpa.org.

City Parks and Open Space

The public park and open space system in Ventura includes neighborhood, community, citywide, and linear parks. As shown in Table 6-2, the City oversees nearly 600 acres of developed park facilities, plus the linear park network, which provides important connections among watersheds for both people and wildlife.

As the City continually strives to improve the quality of leisure and recreation opportunities for everyone in the community, it must address a number of challenges such as:

- modernizing existing facilities,
- finding appropriate land for new facilities,
- developing useful and enjoyable public spaces, such as plazas and mini-parks in urban settings,
- formalizing shared use arrangements for non-City facilities like school playfields,
- meeting increasing demand for athletic courts, fields and pools,
- provide opportunities for passive recreation, and
- providing services needed by youth, seniors, and residents with special needs.

Neighborhood Parks
Typically less than 8 acres each, these smaller parks primarily serve specific residential areas in the community. The 18 neighborhood parks in Ventura cover about 73 total acres. Any future development outside the current city limits will have to provide new neighborhood parks to serve the added population.

Community Parks
These parks are designed to offer specialized opportunities and facilities to residents of more than one neighborhood. Amenities in community parks may include formal athletic fields, courts, recreation buildings, preschool and youth play structures, group and individual picnic areas, and landscaped areas for informal activity or leisure.

Citywide Parks
These parks feature recreational opportunities that draw a wide range of age and interest groups from throughout the city. They offer a variety of attractive amenities, such as large open spaces, unique natural resources, interpretive centers, cultural amenities, group picnic areas, sports facilities, and equestrian, bicycling, and hiking trails. The Ventura Community Park also serves some citywide park functions and attracts visitors from outside the city with its high-quality playing fields and aquatic center.

Linear Parks
Ventura's unique linear park network intersperses trails and picnic areas among a mostly undeveloped web of barranca and riverbanks that provide valuable wildlife habitat and migration corridors. The linear parks also merge with a number of neighborhood and community parks, complementing developed recreation areas with natural riparian qualities. Extending trails through the linear park network can create additional opportunities for low-impact contact with nature, and in some cases even provide pleasant non-automobile commuting options.

Table 6-2 City Park Facilities

Park	Park Size (in acres)				
	Neighborhood Parks	Community Parks	Citywide Parks	Special Use Facilities	Total
Albinger Archaeological Museum				0.9	**0.9**
Arroyo Verde Park	2.0	23.0	104.3		**129.3**
Barranca Vista Park	8.7				**8.7**
Blanche Reynolds Park	3.4				**3.4**
Camino Real Park			38.2		**38.2**
Cemetery Memorial Park	7.1				**7.1**
Chumash Park	6.1				**6.1**
Downtown Mini-Park	0.4				**0.4**
Eastwood Park				0.7	**0.7**
Fritz Huntsinger Youth Sports Complex	4.3	14.0			**18.3**
Grant Park			107.3		**107.3**
Harry A. Lyon Park			10.7		**10.7**
Hobert Park	7.1				**7.1**
Juanamaria Park	5.0				**5.0**
Junipero Serra Park	2.7				**2.7**
Linear Park Network				46.0	**46.0**
Marina Park			15.3		**15.3**
Marion Cannon Park	5.0				**5.0**
Mission Park	1.5				**1.5**
Ocean Avenue Park	1.3				**1.3**
Olivas Adobe Historical Park				22.5	**22.5**
Ortega Adobe Historic Residence				0.3	**0.3**
Plaza Park	3.7				**3.7**
Promenade Park	1.0				**1.0**
Seaside Wilderness Park[1, 2]				24.0	**24.0**
Surfers Point at Seaside Park[1]				3.4	**3.4**
Ventura Community Park		100.0			**100.0**
Westpark	1.5	5.8			**7.3**
Total	**60.8**	**142.7**	**275.8**	**97.8**	**577.1**

Sources: City of Ventura, 2004. Note: several parks serve functions in more than one category.
[1] Acreage varies with ocean high levels.
[2] Acreage varies with fluctuations in Ventura River level.

As with most parks in the city, resources for linear park system improvements typically come through conditions placed on adjacent development. City regulations establish standards for park width, landscaping, fencing, lighting, and tree rows that apply specifically along barrancas, freeways, rivers, the shoreline, harbor, hillsides, and utility rights-of-way.

Recreation Programs

The City operates four neighborhood centers where recreation programs and senior services are available: the Ventura Avenue Adult Center, Senior Recreation Center, Barranca Vista Center, and Westpark Community Center. The City also offers a wide range of sports programs, including youth and adult sports programs, classes, aquatics, and corporate games. Other City-sponsored recreational activities include arts and environmental education, community gardening, recreation programs for special needs residents, and after-school activities and summer camps.

A variety of other recreation opportunities are available in Ventura in addition to City programs. Foremost among these are all of the activities possible at State beaches and developed waterfront areas. Other local non-City facilities include the County Fairgrounds and local golf courses. In addition, joint-use agreements allow city residents to use sports fields, pools, and gymnasiums during certain times at public schools and Ventura College.

The policies and actions in this chapter seek to further expand local park and recreation choices by:

- identifying sites for new parks,
- increasing public access to open space, including via linear park trails,
- collaborating with schools and other local agencies and organizations,
- ensuring universal and equal access to parks and recreation facilities, and
- allowing appropriate revenue-generating activities at City parks.

Policy 6A: Expand the park and trail network to link shoreline, hillside, and watershed areas.

Action 6.1: Develop new neighborhood parks, pocket parks, and community gardens as feasible and appropriate to meet citizen needs, and require them in new development.

Action 6.2: Require higher density development to provide pocket parks, tot lots, seating plazas, and other aesthetic green spaces.

Action 6.3: Work with the County to plan and develop trails that link the City with surrounding open space and natural areas, and require development projects to include trails when appropriate.

Action 6.4: Request Flood Control District approval of public access along unchannelized watercourses for hiking.

Action 6.5: Seek landowner permission to allow public access on properties adjacent to open space where needed to connect trails.

Action 6.6: Update plans for and complete the linear park system as resources allow.

Action 6.7: Work with the County of Ventura to initiate efforts to create public trails in the hillsides.

Action 6.8: Update and require periodic reviews of the Park and Recreation Workbook as necessary to reflect City objectives and community needs.

Action 6.9: Require dedication of land identified as part of the City's Linear Park System in conjunction with new development.

Action 6.10: Evaluate and incorporate, as feasible, linear park segments in the General Bikeway Plan.

Action 6.11: Update standards for citywide public parks and open space to include an expanded menu of shared park types, and identify locations and potential funding sources for acquiring new facilities in existing neighborhoods.

Action 6.12: Update and carry out the Grant Park Master Plan.

Action 6.13: Foster the partnership between the City and Fair Board to improve Seaside Park.

Policy 6B: Ensure equal access to facilities and programs.

Action 6.14: Improve facilities at City parks to respond to the requirements of special needs groups.

Action 6.15: Adjust and subsidize fees to ensure that all residents have the opportunity to participate in recreation programs.

Action 6.16: Update the project fee schedule as necessary to ensure that development provides its fair share of park and recreation facilities.

Policy 6C: Provide additional gathering spaces and recreation opportunities.

Action 6.17: Update and create new agreements for joint use of school and City recreational and park facilities.

Action 6.18: Offer programs that highlight natural assets, such as surfing, sailing, kayaking, climbing, gardening, and bird watching.

Action 6.19: Provide additional boating and swimming access as feasible.

Action 6.20: Earmark funds for adequate maintenance and rehabilitation of existing skatepark facilities, and identify locations and funding for new development of advanced level skatepark facilities.

Policy 6D: Increase funding and support for park and recreation programs.

Action 6.21: Promote the use of City facilities for special events, such as festivals, tournaments, and races.

Action 6.22: Enter into concession or service agreements where appropriate to supplement City services.

Figure 6-1
Public Faciities

ventura's general plan

OUR HEALTHY & SAFE COMMUNITY

"A city, like a living thing, is a united and continuous whole."

— Plutarch
ca. 50-120 AD, author of *Moralia*

CITY OF
VENTURA

7. OUR HEALTHY AND SAFE COMMUNITY

Our goal is to build effective community partnerships that protect and improve the social well-being and security of all our citizens.

Community Wellness

Keeping the small town feel of Ventura depends on working together as a community to look out for the well being of all residents, especially those most at risk. Community wellness requires comprehensive preventative care, as well as careful preparation for and response to dangers within the built environment and to risks posed by natural processes (see Figure 7-1).

Adequate shelter, sufficient medical services, walkable neighborhoods, and proper nutrition create an essential foundation for a healthy community. Reducing as much as possible the threat to people and property from earthquakes, landslides, floods, and fires further enhance the collective wellness of the city. In addition, a healthy Ventura community requires thorough protection from crime, and freedom from pollution, unwanted noise, and the threat of hazardous materials.

***Alquist-Priolo** designation requires a geologic investigation prior to the approval of a development permit to determine if a specific site within the zone is threatened by surface displacement from future fault movement.*

Geologic and Flood Hazards

Ventura lies in an active geologic region and is therefore subject to a variety of seismic hazards, including ground shaking, liquefaction, and slope failure. State law requires the City to regulate development in mapped seismic hazard zones. Major faults in the city include the Ventura-Foothill (a State-designated Alquist-Priolo Earthquake Fault Zone), Oak Ridge, McGrath, Red Mountain and Country Club Faults. Areas closest to these faults are most likely to experience ground shaking or rupture in the event of an earthquake. Liquefaction during an earthquake is most likely to occur in areas with loose, granular soils where the water table lies within 50 feet of the surface. As the soil liquefies, buildings and other objects may tilt or sink.

Hillside stability varies based on slope, soil, rock type and groundwater depth. The hills north of Poli Street/Foothill Road have experienced many historic landslides and are prone to future movement. The City Hillside Management Program limits development in the area to minimize dangers from landsliding, erosion, flooding, and fire, and to retain natural and scenic character.

The Federal Emergency Management Agency regulates development along watercourses based on the likelihood of flooding: the basic benchmark – the 100-year flood – has a one percent chance of occurring in any given year. Although the mapped 100-year flood hazard areas for local rivers and barrancas are fairly limited in size, the largest recorded flood events along the Ventura and Santa Clara Rivers, both following heavy rains in 1969, exceeded the 100-year flood zone. The policies and actions in this Chapter intend to limit harm from geologic and flood events by requiring detailed risk analyses and mitigation prior to development of sites in hazard prone areas.

Fire and Emergency Response

The Ventura Fire Department responds to fire, medical, and disaster calls from six stations in the city. The Department's goal is to reach the scene within 4 minutes 90% of the time. The Department has a reciprocal agreement with the County Fire Protection District to ensure that Ventura residents receive the swiftest service possible. The Department also has a responsibility to provide disaster preparedness for the City. Particular fire department concerns in the City include:

- the need for reliable and sustainable source of fire service revenue,
- lengthy response times to areas farthest from existing stations (See Figure 7-2),
- firefighter and support staffing levels that are far below the .98 firefighter per 1,000 population averages of other municipal fire departments with comparable city size, age, and population,
- the threat of wildland fire entering urban area, and
- the lack of fire protection systems in older structures.

The policies and actions in this Chapter aim to optimize firefighting and emergency response capabilities through oversight of new development, improved facilities, and added staff.

Police Protection

Ventura Police response to crimes in progress or alarm soundings averages less than six minutes, and less than sixteen minutes for most other calls. While the local crime rate is slightly higher than State average, the Department hopes to better engage the community in policing efforts to lower crime levels. As part of a Strategic Planning Process, the Department has established the following goals:

- reduce crime and the fear of crime
- improve the quality of life in neighborhoods
- enhance community and police partnerships
- develop personnel
- continued accountability

One-time grant funding has helped add officers dedicated to community crime prevention, gang control, and youth mentoring programs. As these grants end the City must face the challenge of funding these services. Actions in this Chapter seek to improve the full range of police services to maximize community safety by increasing staffing, outreach efforts, and public access to police services.

Noise

Noise is generally defined as unwanted sound. Its effects can range from annoyance to nuisances to health problems. State law requires the City to identify and address noise sources and establish projected noise levels for roadways, railroads, industrial uses, and other significant generators. The Noise Contours map (Figure 7-3) is used to help guide land use in a way that minimizes exposure of residents to excessive noise.

Vehicle traffic is by far the greatest source of noise affecting Ventura residents. Other sources include the Seaside Park raceway, the Grant Park shooting range, and railroad, commercial, and industrial activity. Homes, schools, hotels, and hospitals are considered sensitive receptors where excessive noise can interfere with normal activities.

Noise intensity is customarily measured on the decibel scale, an index of loudness. Sounds as faint as 10 decibels (dB) are barely audible, while noise over 120 dB can be painful or damaging to hearing (Table 7-1 shows some typical noise levels). A sound 10 dB higher than another is perceived as about twice as loud. A 5 dB change is readily noticeable, but a 3 dB difference is barely perceptible.

As shown in Table 7-2, normally acceptable outdoor noise in residential areas may reach 65 decibels. The Ldn label in the table indicates that sound is averaged over time to account for the fact that sources like traffic or aircraft may cause fluctuations of more than 20 dB over a few seconds. CNEL refers to the fact that 5 dB is added to noise after 7 p.m. and 10 dB added from 10 p.m. to 7 a.m., when quieter conditions make sound more noticeable.

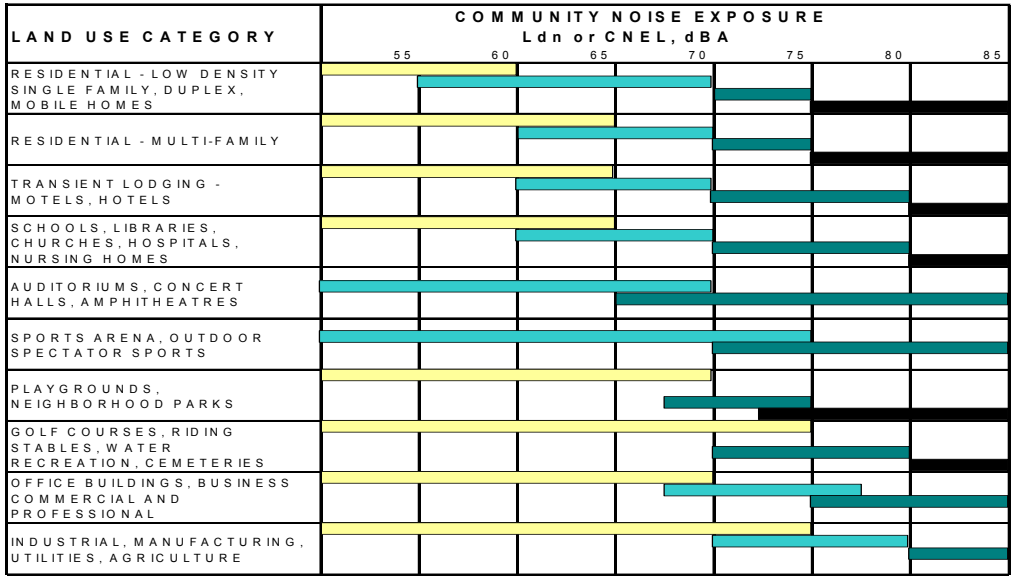
The State Building Code requires an acoustical study whenever outdoor noise would exceed 60 decibels at a proposed duplex, multifamily residence, hotel, motel or other attached dwelling. The study must show that the proposed project design would result in interior noise levels of 45 dB or less.

Although future increases in traffic are not expected to produce a significant change in perceived noise levels, other specific sound generators have been identified as problems in the community. The policies and actions in this chapter look to reduce the exposure of people in Ventura to these noise sources.

Table 7-1. Typical Noise Levels

Type of Noise or Environment	Decibels
Recording Studio	20
Soft Whisper; Quiet Bedroom	30
Busy Open-plan Office	55
Normal Conversation	60-65
Automobile *at 20 mph 25 ft. away*	65
Vacuum Cleaner *10 ft. away*	70
Dump Truck *at 50 mph 50 ft. away*	90
Train Horn *100 ft. away*	105
Claw Hammer; Jet Takeoff *200 ft. away*	120
Shotgun *at shooter's ear*	140

Table 7-2
Acceptable Noise Levels



NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

Source: General Plan Guidelines, California Office of Planning and Research

Hazardous Materials

Hazardous materials include medical and industrial wastes, pesticides, herbicides, radioactive materials, and combustible fuels. Improper use, storage, transport, or disposal of these materials may result in harm to humans, surface or ground water degradation, air pollution, fire, or explosion. Most of the several hundred facilities in Ventura that use or store hazardous materials lie along Ventura Avenue or in the Arundell industrial district.

The Fire Department maintains a team specially trained and equipped to respond to hazardous materials emergencies. Additional equipment and personnel for large-scale hazardous materials incidents is available from the County Fire Protection District, the City of Oxnard, and the U.S. Naval Construction Battalion Center in Port Hueneme.

The Westside and North Avenue neighborhoods include about 30 brownfields: sites that may possess contaminated soils but also have potential for reuse. Cleanup of these sites will make them more attractive for redevelopment that can improve the neighborhoods and generate employment and tax revenue. The City has established a Brownfield Assessment Demonstration Pilot Program to fund site assessments and initiate remediation. The policies and actions in this chapter intend to minimize the risk of adverse health effects of hazardous materials by regulating their location and seeking funding for cleanup of brownfield sites to encourage their reuse.

Policy 7A: Encourage wellness through care and prevention.

Action 7.1: Work with interested parties to identify appropriate locations for assisted-living, hospice, and other care-provision facilities.

Action 7.2: Provide technical assistance to local organizations that deliver health and social services to seniors, homeless persons, low-income citizens, and other groups with special needs.

Action 7.3: Participate in school and agency programs to:

- provide healthy meals,
- combat tobacco, alcohol, and drug dependency,
- distribute city park and recreation materials through the schools, and
- distribute information about the benefits of proper nutrition and exercise.

Action 7.4: Enhance or create ordinances which increase control over ABC licensed premises.

Action 7.5: Investigate the creation of new land use fees to enhance funding of alcohol related enforcement, prevention and training efforts.

Policy 7B: Minimize risks from geologic and flood hazards.

Action 7.6: Adopt updated editions of the California Construction Codes and International Codes as published by the State of California and the International Code Council respectively.

Action 7.7: Require project proponents to perform geotechnical evaluations and implement mitigation prior to development of any site:

- with slopes greater than 10 percent or that otherwise have potential for landsliding,
- along bluffs, dunes, beaches, or other coastal features
- in an Alquist-Priolo earthquake fault zone or within 100 feet of an identified active or potentially active fault,
- in areas mapped as having moderate or high risk of liquefaction, subsidence, or expansive soils,
- in areas within 100-year flood zones, in conformance with all Federal Emergency Management Agency regulations.

Action 7.8: To the extent feasible, require new critical facilities (hospital, police, fire, and emergency service facilities, and utility "lifeline" facilities) to be located outside of fault and tsunami hazard zones, and require critical facilities within hazard zones to incorporate construction principles that resist damage and facilitate evacuation on short notice.

Action 7.9: Maintain and implement the Standardized Emergency Management System (SEMS) Multihazard Functional Response Plan.

Action 7.10: Require proponents of any new developments within the 100-year floodplain to implement measures, as identified in the Flood Plain Ordinance, to protect structures from 100-year flood hazards (e.g., by raising the finished floor elevation outside the floodplain).

Action 7.11: Prohibit grading for vehicle access and parking or operation of vehicles within any floodway.

Policy 7C: Optimize firefighting and emergency response capabilities.

Action 7.12: Refer development plans to the Fire Department to assure adequacy of structural fire protection, access for firefighting, water supply, and vegetation clearance.

Action 7.13: Resolve extended response time problems by:

- adding a fire station at the Pierpont/Harbor area,
- relocating Fire Station #4 to the Community Park site,
- increasing firefighting and support staff resources,
- reviewing and conditioning annexations and development applications, and
- require the funding of new services from fees, assessments, or taxes as new subdivisions are developed.

Action 7.14: Educate and reinforce City staff understanding of the Standardized Emergency Management System for the State of California.

Policy 7D: Improve community safety through enhanced police service.

Action 7.15: Increase public access to police services by:

- increasing police staffing to coincide with increasing population, development, and calls for service,
- increasing community participation by creating a Volunteers in Policing Program, and,
- require the funding of new services from fees, assessments, or taxes as new subdivisions are developed.

Action 7.16: Provide education about specific safety concerns such as gang activity, senior-targeted fraud, and property crimes.

Action: 7.17: Establish a nexus between police department resources and increased demands associated with new development.

Action 7.18: Continue to operate the Downtown police storefront.

Action 7.19: Expand Police Department headquarters as necessary to accommodate staff growth.

Policy 7D: Minimize exposure to air pollution and hazardous substances.

Action 7.20: Require air pollution point sources to be located at safe distances from sensitive sites such as homes and schools.

Action 7.21: Require analysis of individual development projects in accordance with the most current version of the Ventura County Air Pollution Control District Air Quality Assessment Guidelines and, when significant impacts are

identified, require implementation of air pollutant mitigation measures determined to be feasible at the time of project approval.

Action 7.22: In accordance with Ordinance 93-37, require payment of fees to fund regional transportation demand management (TDM) programs for all projects generating emissions in excess of Ventura County Air Pollution Control District adopted levels.

Action 7.23: Require individual contractors to implement the construction mitigation measures included in the most recent version of the Ventura County Air Pollution Control District Air Quality Assessment Guidelines.

Action 7.24: Only approve projects involving sensitive land uses (such as residences, schools, daycare centers, playgrounds, medical facilities) within or adjacent to industrially designated areas if an analysis provided by the proponent demonstrates that the health risk will not be significant.

Action 7.25: Adopt new development code provisions that ensure uses in mixed-use projects do not pose significant health effects.

Action 7.26: Seek funding for cleanup of sites within the Brownfield Assessment Demonstration Pilot Program and other contaminated areas in West Ventura.

Action 7.27: Require proponents of projects on or immediately adjacent to lands in industrial, commercial, or agricultural use to perform soil and groundwater contamination assessments in accordance with American Society for Testing and Materials standards, and if contamination exceeds regulatory action levels, require the proponent to undertake remediation procedures prior to grading and development under the supervision of the County Environmental Health Division, County Department of Toxic Substances Control, or Regional Water Quality Control Board (depending upon the nature of any identified contamination).

Action 7.28: Educate residents and businesses about how to reduce or eliminate the use of hazardous materials, including by using safer non-toxic equivalents.

Action 7.29: Require non-agricultural development to provide all necessary buffers, as determined by the Agriculture Commissioner's Office, from agricultural operations to minimize the potential for pesticide drift.

Action 7.30: Require all users, producers, and transporters of hazardous materials and wastes to clearly identify the materials that they store, use, or transport, and to notify the appropriate City, County, State and Federal agencies in the event of a violation.

Action 7.31: Work toward voluntary reduction or elimination of aerial and synthetic chemical application in cooperation with local agricultural interests and the Ventura County agricultural commissioner.

Policy 7E: Minimize the harmful effects of noise.

Action 7.32: Require acoustical analyses for new residential developments within the mapped 60 decibel (dBA) CNEL contour, or within any area designated for commercial or industrial use, and require mitigation necessary to ensure that:

- Exterior noise in exterior spaces of new residences and other noise sensitive uses that are used for recreation (such as patios and gardens) does not exceed 65 dBA CNEL, and
- Interior noise in habitable rooms of new residences does not exceed 45 dBA CNEL with all windows closed.

Action 7.33: As funding becomes available, construct sound walls along U.S. 101, SR 126, and SR 33 in areas where existing residences are exposed to exterior noise exceeding 65 dBA CNEL.

Action 7.34: Request that sound levels associated with concerts at the County Fairgrounds be limited to 70 dBA at the eastern edge of that property.

Action 7.35: Request the termination of auto racing at the County fairgrounds.

Action 7.36: Amend the noise ordinance to restrict leaf blowing, amplified music, trash collection, and other activities that generate complaints.

Action 7.37: Use rubberized asphalt or other sound reducing material for paving and re-paving of City streets.

Action 7.38: Update the Noise Ordinance to provide standards for residential projects and residential components of mixed-use projects within commercial and industrial districts.

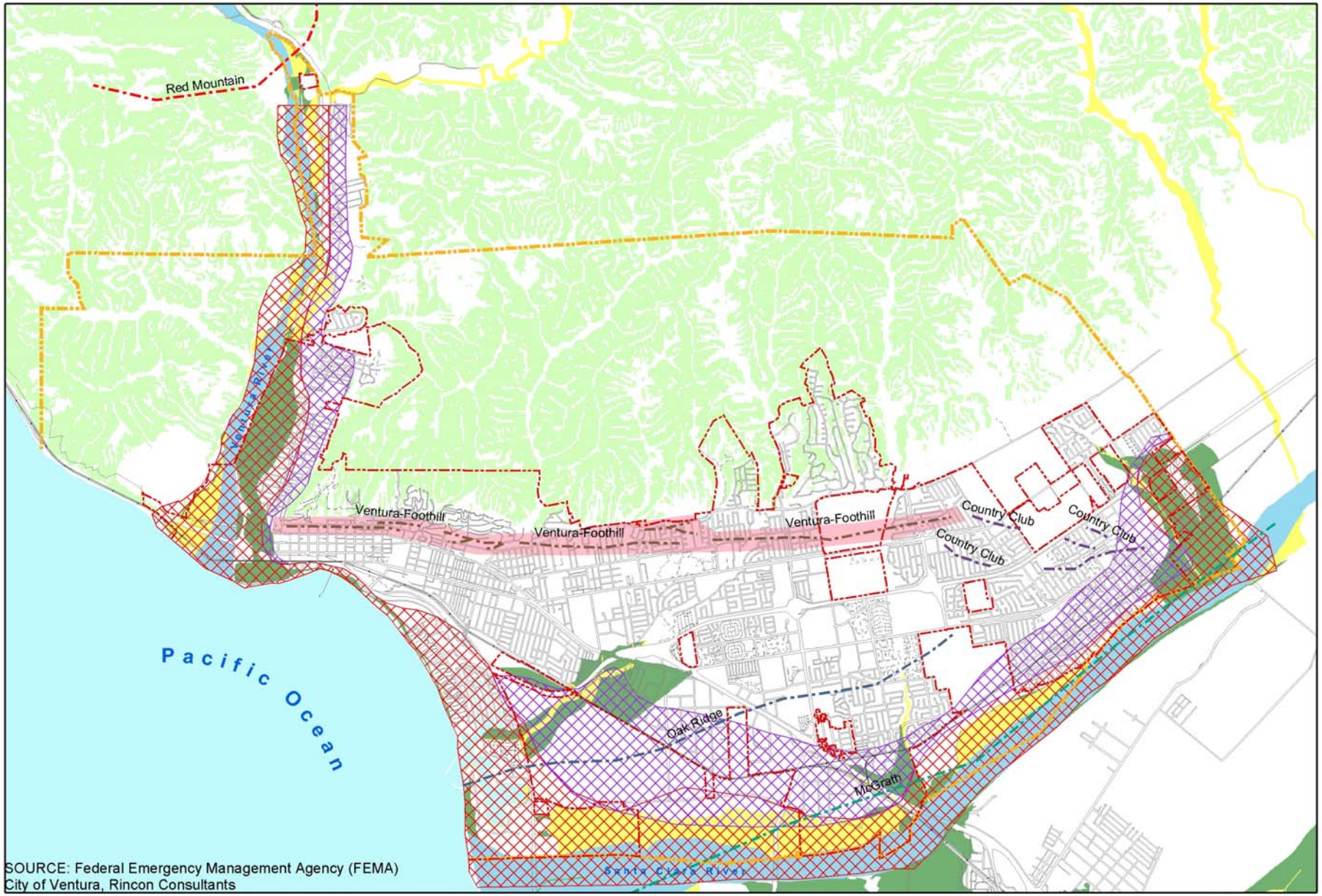


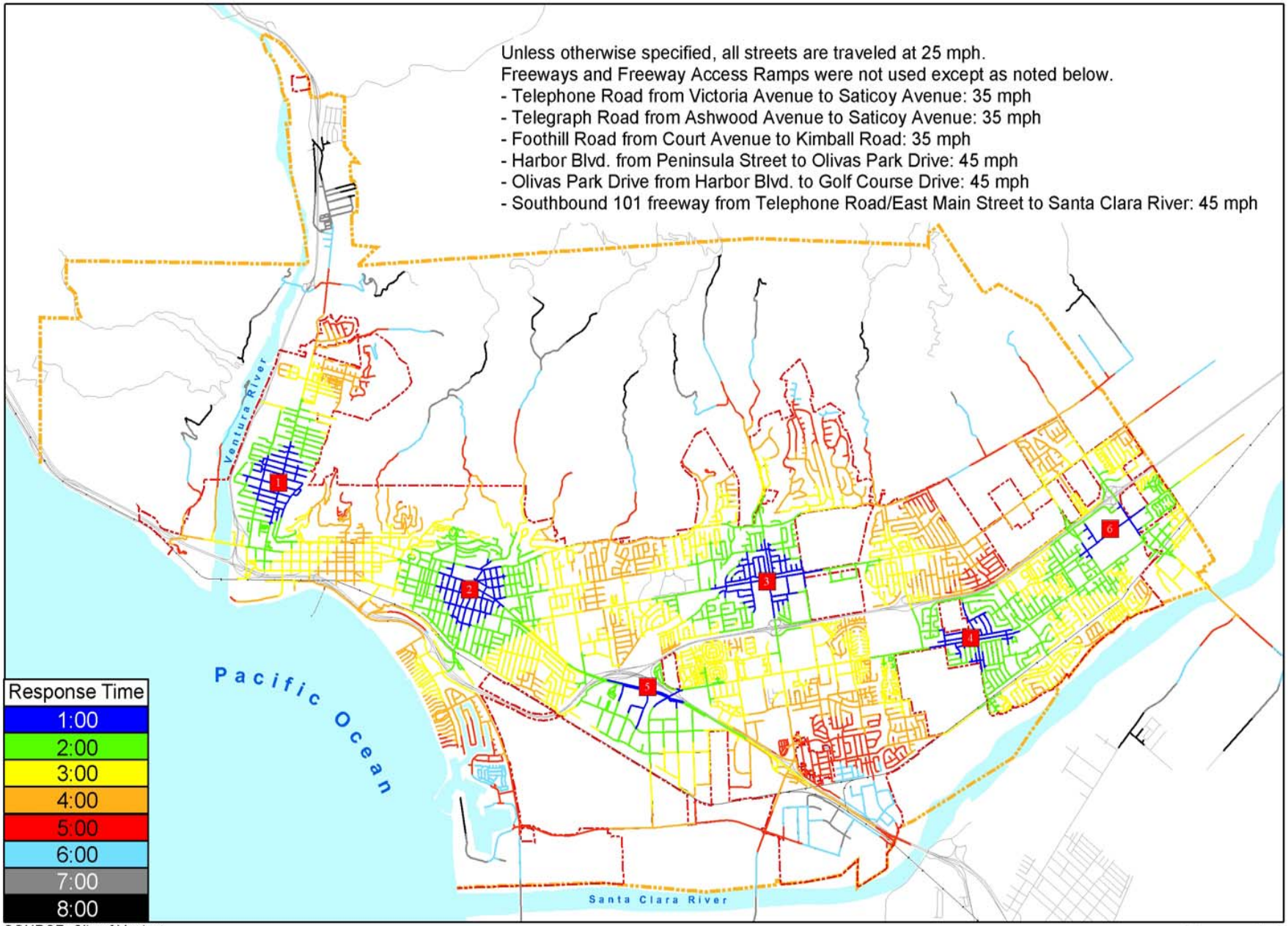
Figure 7-1
Natural Hazards

FEMA Flood Hazard Zones
- A (100-yr floodzone)
- B (500-yr floodzone)
- Floodway

Liquefaction Zones
- High Water Table
- Low Water Table

Major Fault Systems
- Country Club
- McGrath
- Oak Ridge
- Red Mountain
- Ventura-Foothill

Other
- City Limits
- Planning Boundary
- >30% Slope



SOURCE: City of Ventura

City Limits

Planning Boundary

Existing Fire Stations 1-6

Figure 7-2
Fire Response Time

Figure 7-3
Noise Contours

Noise Contours
- 60dBA
- 65dBA
- 70dBA
- 75dBA
- Countoured Streets (Over 5000 ADT)
- Recreation Centers
- Hospitals
- Schools
- Library
- Government Centers
- City Limits
- Planning Boundary

ventura's general plan

OUR EDUCATED COMMUNITY

"A vigorous culture capable of making corrective, stabilizing changes depends heavily on its educated people, and especially upon their critical capacities and depth of understanding."

— Jane Jacobs
Dark Age Ahead

CITY OF
VENTURA

8. OUR EDUCATED COMMUNITY

Our goal is to encourage academic excellence and life-long learning resources to promote a highly-educated citizenry.

Lifelong Learning

Education is more important than ever before as the foundation for the vitality of informed community participation in Ventura. The *Ventura Vision* calls for the city to be "a community dedicated to educational excellence and an emphasis on lifelong learning." A truly educated community is key to achieving most of the goals in this General Plan because:

- In the 21st Century information economy a highly educated and skilled workforce is vital to community prosperity,
- Education and the institutions that provide it are critical to achieving environmental and cultural leadership, and
- An educated and informed citizenry is essential to sound planning and decision-making.

While Ventura has a comparatively well-educated population (see Table 8-1), the high costs of doing business and finding housing in the city will force even greater emphasis on businesses and jobs that require ever-higher levels of skill. The need and desire for lifelong learning will require relentlessly expanding educational resources and access to them in the years ahead. Plus, the assets that strong educational institutions provide are necessary to bring a rich cultural life to the community as well.

Ventura can build on an impressive base of well-regarded public schools, array of private alternatives, major community college, satellite university campuses, expanding media-training institute, law school, and three branch libraries, among other educational resources. The key to becoming renowned as a local "learning community" lies in creating stronger linkages between these existing resources and integrating them into the physical and social landscape of our community.

Leveraging our Assets

Excellence in public education is the top priority for the Ventura Unified School District (whose boundaries extend beyond the city). In Ventura, the District manages 16 elementary schools, four middle schools, three high schools, and one continuation high school, plus independent study and adult education programs.

In addition to District schools, the city also is home to more than a dozen private schools (see Table 8-2), serving 13 percent of elementary and high school students living in Ventura, according to the 2000 Census. Figure 6-1 shows school locations in the city.

Table 8-1
Education Level

Schooling Completed	Percent of Population
High School	21.7
Some College	28.2
Associate Degree only	9.6
Bachelors Degree only	15.4
Graduate Degree	9.3
High School Diploma & Above	***84.1***
Associate Degree & Above	***34.2***

Source: 2001 Ventura County Economic Outlook

Table 8-2
Private Schools

School	Grades
First Baptist Day	K-5
St. Augustine Academy	4-12
Sacred Heart	K-8
Ventura Missionary Christian Day	K-8
College Heights Christian	K-8
St. Bonaventure High School	9-12
Holy Cross	K-8
Our Lady of The Assumption	K-8
St. Paul's Parish Day	K-8
Grace Lutheran Christian Day	K-6
Jameson	K-12
Ventura County Christian	K-12
Hill Road Montessori Preschool	K-3
Wells Road Baptist Academy	K-12

Most public schools operate at or near capacity (see Table 8-3), and continuing growth in Ventura requires the District to search for sites for new schools (see Table 8-4). Developers of new projects are required to dedicate land or pay fees for school purposes, and any major annexation of land outside the city is likely to have to provide a school site to serve new resident children. Still, the scarcity and cost of suitable sites means that greater thought will need to be given to shared facility use and other non-traditional approaches to expanding capacity.

Table 8-3. Ventura Unified School District Enrollment

Schools – No.	Students	Capacity
Elementary – 17	8,093	95%
Middle – 4	4,304	93%
High - 3	4,820	85%
TOTAL	**17,217**	**92%**

Source: Ventura Unified School District, 2003

Table 8-4. Public School Demand

School Type	Students/ School	School Needs	Acres Needed[1]
Elementary	600	4	40
Middle	1,000	1	20
High	2,000	1	40
TOTAL		**6**	**100**

1. Assumes 10 acres for elementary schools, 20 acres for middle schools, and 40 acres for high schools.

Source: Ventura Unified School District, 2003

Ventura is increasingly becoming recognized as a center for higher education. Ventura College is a highly respected two-year school with more than 12,000 students, providing everything from a distinguished transfer opportunity for the University of California to certificates and associates degrees in important fields such as manufacturing and nursing. Students also can obtain four-year degrees in certain fields at the UCSB Ventura Center. Brooks Institute of Photography provides education in photojournalism, filmmaking, and related fields, providing the city with a significant cultural asset. Residents can earn graduate degrees in law, public policy, and education at the Ventura campuses of California Lutheran University, Azusa Pacific University, the Ventura College of Law, and the Southern California Institute of Law. The opening of the nearby California State University Channel Islands has drawn many students and faculty to live in Ventura, especially those in creative fields.

Combined, these institutions of higher learning provide Ventura with tremendous educational assets. Through the policies and actions in this chapter, the City is committed to nurturing these institutions, creating synergy among them, and instilling both cultural and economic opportunities.

Libraries of the Future

The County public library system in Ventura currently operates three branch libraries that serve about 200,000 visits annually (see Table 8-5). But in a digital age where more and more content is available online, the traditional book borrowing function is becoming outmoded. Library administrators and staff, the City's Library Advisory Commission, and patrons have all pointed to needs for adding library space, extending operating hours, and updating and expanding learning resources.

At a more fundamental level, the ideas of what constitutes a library and how it fits the patterns of a learning community need to be reexamined. Integration with school libraries, including the Ventura College Learning Center, is a top priority for this reevaluation, as embodied in the policies and actions in this chapter.

City and Community Programs

Traditional classroom settings alone cannot provide the complete set of educational skills and experience needed by people of all ages. The City provides a variety of learning opportunities, including youth and adult art programs, environmental education, adaptive recreation programs, youth after-school activities, and summer camps. Community organizations also provide a range of classes and experiences, including tours, museums, lectures, and hands-on activities. Expanding venues for such activities and promoting participation in them are key challenges.

Policies and actions in this chapter seek to expand lifelong learning opportunities for everyone in the community.

Table 8-5. Local Libraries

Library	Card-Holders	2003-2004 Patronage	Hours Open Weekly	Facility Size (sq. ft.)
E. P. Foster	48,195	366,134	54	31,000
H. P. Wright			39	12,000
Avenue			25	3,000

Source: Ventura County Library Administration, 2005

Policy 8A: Reach out to institutions and educators to advance lifelong learning.

Action 8.1: Work closely with schools, colleges, and libraries to provide input into site and facility planning.

Action 8.2: Organize a regional education summit to generate interest in and ideas about learning opportunities.

Action 8.3: Adopt joint-use agreements with libraries, schools, and other institutions to maximize use of educational facilities.

Action 8.4: Distribute information about local educational programs.

Policy 8B: Increase the availability and diversity of learning resources.

Action 8.5: Install infrastructure for wireless technology and computer networking in City facilities.

Action 8.6: Establish educational centers at City parks.

Action 8.7: Work with the State Parks Department to establish a marine learning center at the Harbor.

Action 8.8: Work with the Ventura Unified School District to ensure that school facilities can be provided to serve new development.

Policy 8C: Reshape public libraries as 21st Century learning centers.

Action 8.9: Complete a new analysis of community needs, rethinking the role of public libraries in light of the ongoing advances in information technology and the changing ways that individuals and families seek out information and life-long learning opportunities.

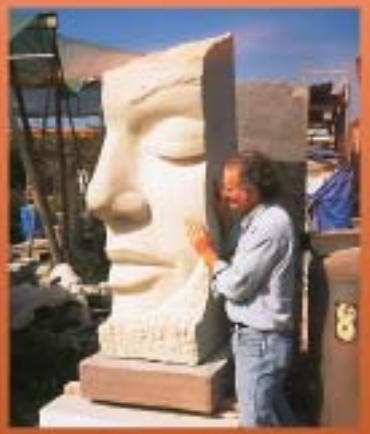
Action 8.10: Reassess the formal and informal relationships between our current three branch public libraries and school libraries – including the new Ventura College Learning Resource Center – as well as joint use of facilities for a broader range or compatible public, cultural, and educational uses.

Action 8.11: Develop a Master Plan for Facilities, Programs, and Partnerships to create an accessible, robust, and vibrant library for the 21st Century system, taking into consideration that circulation of books is no longer the dominant function but will continue to be an important part of a linked network of learning centers.

Action 8.12: Develop formal partnerships, funding, capital strategies, and joint use agreements to implement the new libraries Master Plan.

ventura's general plan

OUR CREATIVE COMMUNITY



"Whatever you can do, or dream you can, begin it. Boldness has genius, power and magic in it."

— Johann Wolfgang von Goethe

CITY OF
VENTURA

9. OUR CREATIVE COMMUNITY

Our goal is to become a vibrant cultural center by weaving the arts and local heritage into everyday life.

A Rich Foundation

Local history, artistic expression, and cultural diversity play vital roles in making Ventura a vibrant and interesting place. The heritage of Chumash civilization, which developed over the course of about 9,000 years, and influences of Mexican settlement establish a rich tableau for the modern development of the city. Art in museums, galleries, and public places, as well as space and energy devoted to the creation of artwork and crafts connect the community in complex and fundamental ways. Cultural expression in the form of festivals and informal gatherings provide additional and essential bonds that strengthen the community.

Historic Context

Abundant food and water, temperate climate, and ample material for tool manufacturing attracted early local inhabitants. Chumash peoples were living in a string of coastal villages when Spanish explorers arrived in 1542. Shisholop village (at the south end of present-day Figueroa Street) was a thriving Chumash provincial capital at the time of the Spanish arrival. Other Chumash villages and burial sites have been found in what are now the North Avenue and Saticoy neighborhoods, as well as north of the Ventura River. Mexican settlers began to arrive in earnest after the founding of Mission San Buenaventura in 1782.

Table 9-1
Key Historical and Cultural Sites

Site	Description
Albinger Museum	Artifacts spanning 3,500 years excavated from a site next to the Mission are on display in this former adobe at 113 East Main Street.
Downtown	Downtown Ventura is home to a variety of 19th Century buildings that house restaurants and retail establishments in a small-town setting with a variety of cultural amenities.
Olivas Adobe Park	Completed in 1849 for the Raymundo ranching family, the well-preserved hacienda at 4200 Olivas Park Road is utilized as concert and banquet facility.
Ortega Adobe	Built in 1857, the adobe is only remaining example of the middle class homes that once lined West Main Street. The building has since been used as a police station and restaurant.
San Buenaventura Mission	Built in 1782, the Mission anchors the western part of the downtown area and is still used for regular Catholic services.
Santa Gertrudis Chapel	The Chapel was originally completed around 1809. The site is located along Highway 33 near Foster Park.
San Miguel Chapel	The site is located at Thompson Boulevard and Palm Street. The original chapel dated back to the early 1800s.
Ventura County Museum of History and Art	The museum at 100 East Main Street houses exhibits featuring local artists and historical artifacts. Expansion plans include a 200-seat auditorium and a gallery with touring exhibits.

Source: City of Ventura

More than 90 historic sites have been identified in the planning area (which includes areas outside the city). Notable ones include the Mission, the Ortega and Olivas Adobes, and the locations of the Santa Gertrudis and San Miguel Chapels (See Table 9-1 and Figure 9-1). Many of the existing buildings in Ventura were constructed between 1880 and 1940, a period that coincided with development of the railroads and harbor. City

Hall (formerly the County Courthouse) and the Mission aqueduct are listed as landmarks on the National Register of Historic Places, and structures in the following historic districts are protected by City architectural controls:

- the grounds within the Mission District,
- the Mitchell block (south of Thompson Boulevard between Chestnut and Fir Streets),
- the Selwyn Shaw block (north of Poli Street between Ann and Hemlock Streets), and
- the Simpson Tract (west of Ventura Avenue between Simpson and Prospect Streets).

Arts and Culture

When the City first adopted a Community Cultural Plan in 1992, Ventura's creative community was in its fledgling stage. Few of the now-thriving professional art and cultural organizations existed (see Table 9-2). A burgeoning visual artist community had made the city its home, but was fairly invisible except to the more intrepid arts supporters and collectors.

Since completion of that plan, the City has either implemented or initiated all of its recommendations, which were developed through extensive public involvement. As a result, the growth of the cultural community has been extraordinary. Now Ventura is home to a wealth of active artists and arts organizations. From 1994-2004, the budgets of arts organizations in Downtown Ventura alone increased from $500,000 to more than $4 million.

Ventura also now has a complement of major cultural institutions unique for a city of its size, including the Ventura Music Festival, the Rubicon Theatre Company, the Ventura County Museum of History and Art, and Focus on the Masters. The individual artists who live and work in the city continue to comprise a major part of its cultural fabric, and are highlighted in popular cultural events like the Downtown ArtWalks.

A strong focus of the City's general is to build the arts infrastructure of Ventura. A strong cultural infrastructure is the foundation of a healthy arts ecosystem: this includes *places* (for arts creation, sales, exhibition, performance, rehearsal, living), *people* (artists, audiences, patrons), and *organizations* (production, support, and presentation).

In keeping with the community's respect for its roots, the Ventura arts scene remains authentic, no small feat in today's competitive environment. While many communities focus on importing Broadway shows or big-name art exhibits to increase their profile, Ventura successfully continues to highlight local artists, architecture, culture, history, and the environment – the unique threads that together comprise the rich tapestry of the Ventura community. Policies and actions in this chapter call for continuing to build the cultural foundations of the community by involving everyone in the production, support, and presentation of art and cultural programs, installing art in public places, providing working and display space for local artists, and identifying a site for an arts and cultural center.

Table 9-2
Art and Cultural Institutions

Name	Description	Years in Operation	Annual Patronage
Buenaventura Arts Association	Fine art gallery in downtown Ventura.	50	5,000
Channelaire Chorus	Women's chorus	42	2,500
City of Ventura Cultural Affairs Division	Supports local arts organizations; produces cultural programs (ArtWalks, Street Fairs, Music Under the Stars, Arts Education classes, grants, public art, etc.)	13	132,000
Focus on the Masters	Documentation of extraordinary artists (photographs, audio and video interviews)	10	15,000
Kids' Art	Ongoing, free kids' creative arts programs	12	350
Music 4 Kids	After school music instruction at Boys & Girls Clubs	4	800
Plexus Dance Theater	Professional modern dance performances	20	1,400
Rubicon Theater	Regional theater – classic and contemporary	6	37,000
San Buenaventura Foundation for the Arts	Arts umbrella organization - supports development of the Cultural Center and produces Arts Explosion	5	5,900
Ventura Area Theater Sports	Live improvisational theater in downtown Ventura	15	5,000
Ventura Artists' Union	Art gallery and weekly arts shows on California Plaza	15	17,000
Ventura College Opera Workshop	Opera and theater company at Ventura College	21	4,500
Ventura County Ballet	Ballet school with twice annual performances	6	11,000
Ventura County Master Chorale	Professional vocal music ensemble	23	6,000
Ventura County Museum of History and Art	Museum featuring exhibits on the history and art of Ventura County	26	55,000
Ventura Music Festival	Annual concert festival presenting international and local performers	11	9,000

Policy 9A: Increase public art and cultural expression throughout the community.

Action 9.1: Require works of art in public spaces per the City's Public Art Program Ordinance.

Action 9.2: Sponsor and organize local art exhibits, performances, festivals, cultural events, and forums for local arts organizations and artists.

Action 9.3: Expand outreach and publicity by:

- promoting locally produced art and local cultural programs
- publishing a monthly calendar of local art and cultural features,
- distributing the *State of the Arts* quarterly report, and
- offering free or subsidized tickets to events.

Action 9.4: Support the creative sector through training and other professional development opportunities.

Action 9.5: Work with the schools to integrate arts education into the core curriculum.

Action 9.6: Promote the cultural and artistic expressions of Ventura's underrepresented cultural groups.

Action 9.7: Offer ticket subsidy and distribution programs and facilitate transportation to cultural offerings.

Policy 9B: Meet diverse needs for performance, exhibition, and workspace.

Action 9.8: Increase the amount of live-work development, and allow its use for production, display, and sale of art.

Action 9.9: Work with community groups to locate sites for venues for theater, dance, music, and children's programming.

Policy 9C: Integrate local history and heritage into urban form and daily life.

Action 9.10: Provide incentives for preserving structures and sites that are representative of the various periods of the city's social and physical development.

Action 9.11: Organize and promote multi-cultural programs and events that celebrate local history and diversity.

Action 9.12: Allow adaptive reuse of historic buildings.

Action 9.13: Work with community groups to identify locations for facilities that celebrate local cultural heritage, such as a living history Chumash village and an agricultural history museum.

Policy 9D: Ensure proper treatment of archeological and historic resources.

Action 9.14: Require archaeological assessments for projects proposed in the Coastal Zone and other areas where cultural resources are likely to be located.

Action 9.15: Suspend development activity when archaeological resources are discovered, and require the developer to retain a qualified archaeologist to oversee handling of the resources in coordination with the Ventura County Archaeological Society and local Native American organizations as appropriate.

Action 9.16: Pursue funding to preserve historic resources.

Action 9.17: Provide incentives to owners of eligible structures to seek historic landmark status and invest in restoration efforts.

Action 9.18: Require that modifications to historically-designated buildings maintain their character.

Action 9.19: For any project in a historic district or that would affect any potential historic resource or structure more than 40 years old, require an assessment of eligibility for State and federal register and landmark status and appropriate mitigation to protect the resource.

Action 9.20: Seek input from the City's Historic Preservation Commission on any proposed development that may affect any designated or potential landmark.

Action 9.21: Update the inventory of historic properties.

Action 9.22: Create a set of guidelines and/or policies directing staff, private property owners, developers, and the public regarding treatment of historic resources that will be readily available at the counter.

Action 9.23: Complete and maintain historic resource surveys containing all the present and future components of the historic fabric within the built, natural, and cultural environments.

Action 9.24: Create a historic preservation element.

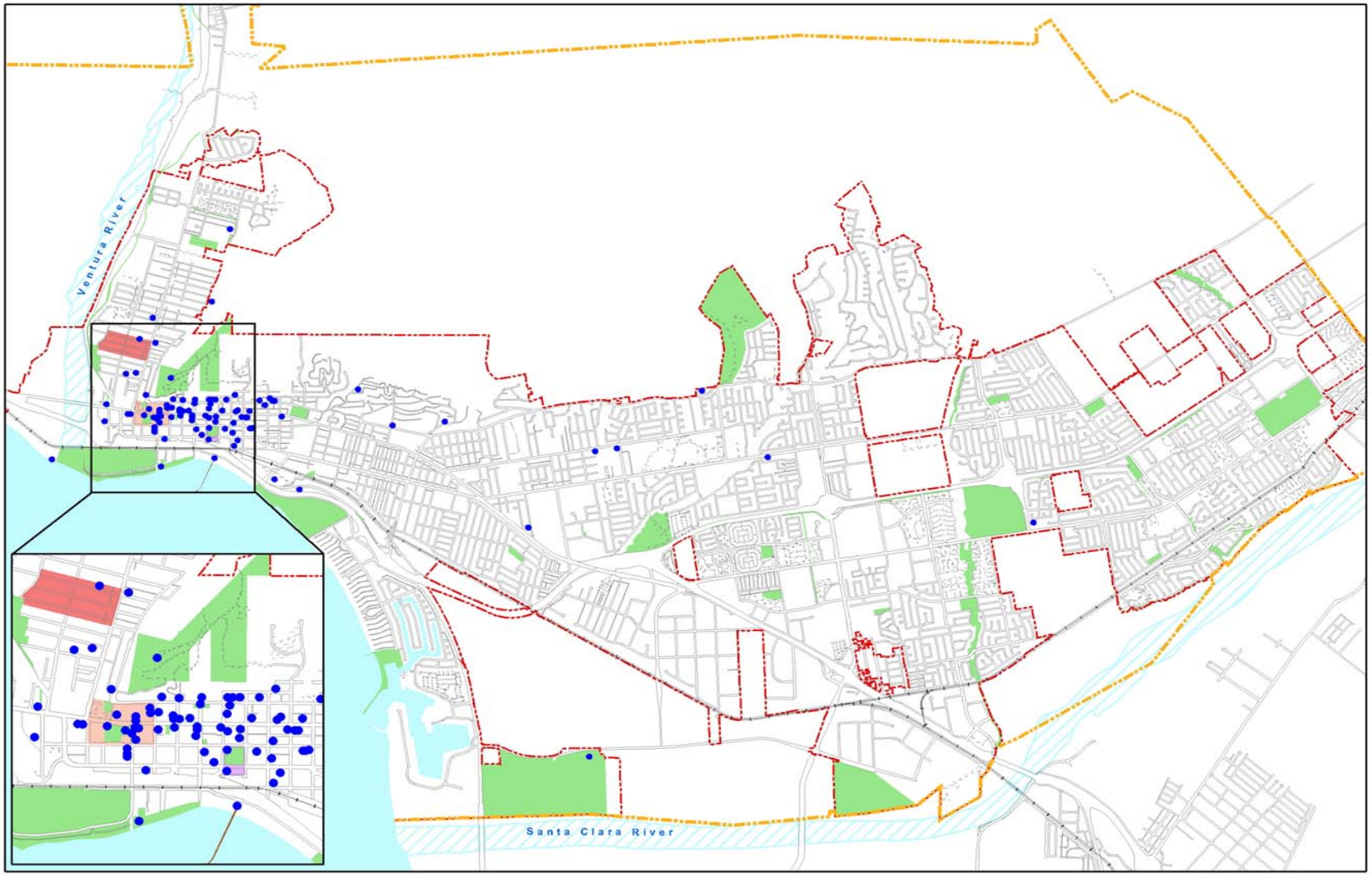
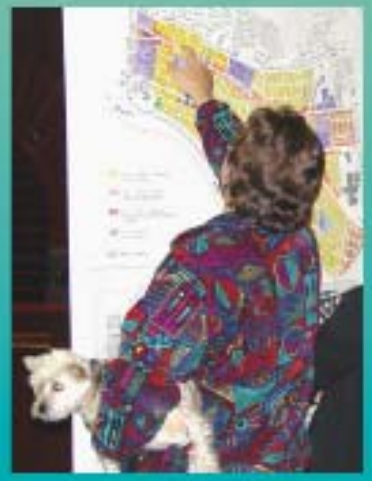


Figure 9-1
Historic Districts and Sites



"Never believe that a few caring people can't change the world. For indeed, that's all who ever have."

— Margaret Mead
Renowned Anthropologist

CITY OF
VENTURA

OUR INVOLVED COMMUNITY

ventura's general plan

10. OUR INVOLVED COMMUNITY

Our goal is to strive to work together as a community to achieve the Ventura Vision through civic engagement, partnerships, and volunteer service.

Civic Engagement

It is not enough to have a vision of smart growth for Ventura. Achieving that vision requires the active and ongoing participation of an engaged and active community. Fortunately, Ventura builds on a strong foundation: thousands of Ventura citizens are involved in their schools and places of worship and give their time to civic, cultural, and charitable organizations. City Commissions, the Community Councils, the Chamber of Commerce and other well-established avenues provide opportunities for community leadership.

This is what Alexis De Toqueville celebrated in his famous book, *Democracy in America*, calling our nation, "the one country in the world, day in and day out, that makes use of an unlimited freedom of association." Yet today in Ventura, as all across America, there is concern about the health of our democracy. Sociologist Robert Putnam gained national attention with his research showing that "by almost every measure, Americans' direct engagement in politics and government has fallen steadily and sharply over the last generation."

Among the symptoms in Ventura have been a decline in voter turnout in recent local elections – (a 36% drop from 1995 through 2003.) Over those years, the ability to build consensus about future development has been undermined by sharply polarized divisions, showdowns at the ballot box, and often rancorous public hearings. The complaint often recurs that planning decisions are made without adequate notice or consideration of the views of those affected. Many citizens criticize the City decision-making process as convoluted and counterproductive.

Moreover, ongoing participation of an engaged community requires civic places where citizens can come together. It is not insignificant that a decline in public participation and the quality of civic discourse has paralleled the loss of civic places in our cities. Historically, governments provided open spaces and buildings that were at the center of a community, physically and symbolically. Town squares and plazas, often faced by a hall for formal gathering and civic engagement, have all but disappeared. The poverty of American public places was apparent after the Columbine High School shooting in Colorado, when citizens gathered to mourn, not in a shared place for people, but in a parking lot.

Nearly everyone agrees we can and should do better. The best model for doing this was the citywide effort to craft the *Ventura Vision*. Thousands participated in a year-long partnership encompassing City government, non-profit organizations, community groups, business,

schools and individual residents to chart the community's future.

The vision of an "involved community" was described in the *Ventura Vision* report as: seeking "broad community collaboration; more widely publicizing city government services, planning processes and policies; better involvement of typically under-represented groups such as youth, seniors and ethnic minorities in community planning; and developing public parks, plazas, neighborhood greenways and other spaces that promote civic interaction and events."

Since that vision was adopted by the City Council in 2000, the City has worked to implement it, building on existing community assets and strengthening the linkages and interconnections that already exist among people, organizations, and shared community goals. A remarkable example of broad community collaboration earned attention throughout Southern California in late 2004. Facing the prospect of winter flooding, the City undertook to evacuate homeless people living in the channel of the Ventura River. This was accomplished by a partnership involving non-profit social service agencies, faith-based organizations, City staff, business leaders, community volunteers and the affected homeless population.

There are many more models of successful community collaboration in Ventura, including: the restoration of the pier, the community's rich array of after-school programs, the implementation of the 1992 Cultural Plan, the 2004 Downtown Charrette, the 2005 Midtown Design Charrette and the establishment of conservancies to preserve the Grant Park cross and Ventura's cherished hillsides.

City government has learned from these efforts to reach broadly and deeply into the community. Civic engagement and trust are built when City representatives actively seek to involve everyone in positive and transparent partnerships. That goal requires a continually evolving effort to promote participation:

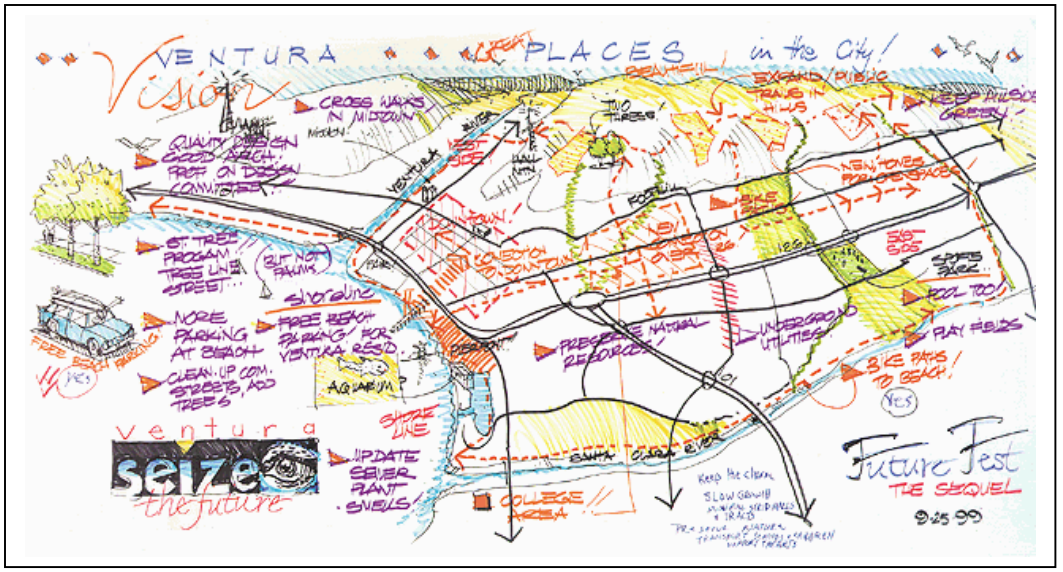
- through proactive and interactive media outreach in the press, on the web, on radio and television,
- by striving to include everyone in decision making and making it convenient for them to participate by seeking them out in their neighborhoods and gathering places like schools, houses of worship and public spaces, and
- through community dialogues, workshops, charrettes, town hall forums, and community councils, in addition to formal public hearings.

More effort needs to be put into building consensus about future growth and change upfront through community planning, rather than waiting until specific development projects are proposed. That effort will continue with the work to craft a citywide "form-based code" and concentrated planning efforts for specific neighborhoods and districts.

Focused attention should be paid to making our public decision-making processes easier to understand and participate in. Citizens have little time or patience for complicated planning and entitlement processes that drag on for years. By establishing clearer rules and public processes for applying them, the policies and actions in this chapter will enable more citizens to feel that they will be heard and their contributions valued. By involving a wider range of the community in clearly setting Ventura's planning goals and standards of quality, we can devote more time to achieving those goals and less time wrangling over specific proposals.

Ventura also needs to reestablish places for civic discourse. While the City will continue to encourage the use of our beautiful City Hall for its historic role of government by and for the people, we also need a hierarchy of civic spaces citywide that are strategically located in neighborhood centers and accessible by pedestrians (see Chapter Three, Action 3.8). Every neighborhood should have access to a physical location designated for public gathering and civic purposes.

Our long-range vision is to build an ethic and a fabric of robust civic engagement – what De Toqueville called "the habits of the heart." His phrase evokes what the Ventura Vision called "direct engagement in public affairs" through "participation, hard work and collaboration . . . sustaining Ventura as an exceptional place." The policies and actions in this chapter aim to do just that.



Policy 10A: Work collaboratively to increase citizen participation in public affairs.

Action 10.1: Conduct focused outreach efforts to encourage all members of the community – including youth, seniors, special needs groups, and non-English speakers – to participate in City activities.

Action 10.2: Obtain public participation by seeking out citizens in their neighborhoods and gathering places such as schools, houses of worship and public spaces.

Action 10.3: Invite civic, neighborhood, and non-profit groups to assist with City project and program planning and implementation.

Action 10.4: Provide incentives for City staff to participate in community and volunteer activities.

Action 10.5: Invite seniors to mentor youth and serve as guides at historical sites.

Action 10.6: Offer internships in City governance, and include youth representatives on public bodies.

Action 10.7: Continue to offer the Ambassadors program to obtain citizens assistance with City projects.

Policy 10B: Raise awareness of City operations and be clear about City objectives.

Action 10.8: Utilize the City website as a key source of information and expand it to serve as a tool for civic engagement.

Action 10.9: Publish an annual report that evaluates City performance in such areas as conservation, housing, and economic development.

Action 10.10: Continue to improve the user-friendliness of the media that communicate information about the City, including the website, cable channels, newsletters, kiosks, and water billing statements.

Policy 10 C: Work at the neighborhood level to promote citizen engagement.

Action 10.11: Establish a clear policy toward the scope, role, boundaries, and jurisdiction of neighborhood Community Councils citywide, with the objectives of strengthening their roles in decision-making.

Action 10.12: Establish stronger partnerships with neighborhood Community Councils to set area priorities for capital investment, community policing, City services, commercial investment, physical planning, education, and other concerns, to guide both City policies and day-to-day cooperation and problem-solving.

Action 10.13: Recognizing that neighborhood empowerment must be balanced and sustained by overall City policies and citywide vision and resources – establish a citywide Neighborhood Community Congress where local neighborhood Community Councils can collaborate and learn from each other.

Action 10.14: Establish clear liaison relationships to foster communication, training, and involvement efforts between the City, neighborhood Community Councils and other community partners, including the Ventura Unified School District and business, civic, cultural and religious groups.

ventura's general plan

APPENDICES

"Individual commitment to a group effort, that is what makes a team work, a company work, a society work, a civilization work."

— Vince Lombardi
Author of *What it Takes To Be #1*, 2001

CITY OF
VENTURA

KEY TO ABBREVIATIONS	
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= Action included in the Land Use Plan of the City's Local Coastal Program	

Number	Action	Lead Entity	Timeframe
1.1	Adhere to the policies and directives of the California Coastal Act in reviewing and permitting any proposed development in the Coastal Zone.	CD [CP]	Ongoing
1.2	Prohibit non-coastal-dependent energy facilities within the Coastal Zone, and require any coastal-dependent facilities including pipelines and public utility structures to avoid coastal resources (including recreation, habitat, and archaeological areas) to the extent feasible, or to minimize any impacts if development in such areas is unavoidable.	CD [CP]	Ongoing
1.3	Work with the State Department of Parks and Recreation, Ventura County Watershed Protection Agency, and the Ventura Port District to determine and carry out appropriate methods for protecting and restoring coastal resources, including by supplying sand at beaches under the Beach Erosion Authority for Control Operations and Nourishment (BEACON) South Central Coast Beach Enhancement program.	PW [E]	Ongoing
1.4	Require new coastal development to provide non-structural shoreline protection that avoids adverse impacts to coastal processes and nearby beaches.	CD [CP]	Ongoing
1.5	Collect suitable material from dredging and development, and add it to beaches as needed and feasible.	PW [E]	Ongoing
1.6	Support continued efforts to decommission Matilija Dam to improve the sand supply to local beaches.	PW [U]	Long-term
1.7	Update the Hillside Management Program to address and be consistent with the Planning Designations as defined and depicted on the General Plan Diagram.	CD [LRP]	Short-term

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Number	Action	Lead Entity	Timeframe
1.8	Buffer barrancas and creeks that retain natural soil slopes from development according to state and Federal guidelines.	CD [LD]	Ongoing
1.9	Prohibit placement of material in watercourses other than native plants and required flood control structures, and remove debris periodically.	PW [MS/P]	Ongoing
1.10	Remove concrete channel structures as funding allows, and where doing so will fit the context of the surrounding area and not create unacceptable flood or erosion potential.	PW [MS/P]	Long-term
1.11	Require that sensitive wetland and coastal areas be preserved as undeveloped open space wherever feasible and that future developments result in no net loss of wetlands or "natural" areas.	CD [LRP]	Short-term
1.12	Update the provisions of the Hillside Management Program as necessary to ensure protection of open space lands.	CD [LRP]	Mid-term
1.13	Recommend that the City's Sphere of Influence be coterminous with existing City limits in the hillsides in order to preserve the hillsides as open space.	CD [LRP]	Short-term
1.14	Work with established land conservation organizations toward establishing a Ventura hillsides preserve.	PW [P]	Long-term
1.15	Actively seek local, state, and Federal funding sources to achieve preservation of the hillsides.	PW [P]	Mid-term
1.16	Comply with directives from regulatory authorities to update and enforce stormwater quality and watershed protection measures that limit impacts to aquatic ecosystems and that preserve and restore the beneficial uses of natural watercourses and wetlands in the city.	PW	Ongoing

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Number		Action	Lead Entity	Timeframe
1.17		Require development to mitigate its impacts on wildlife through the development review process.	CD [CP]	Ongoing
1.18		Require new development adjacent to rivers, creeks, and barrancas to use native or non-invasive plant species, preferably drought tolerant, for landscaping.	CD [CP] PW [P]	Ongoing
1.19		Require projects near watercourses, shoreline areas, and other sensitive habitat areas to include surveys for State and/or federally listed sensitive species and to provide appropriate buffers and other mitigation necessary to protect habitat for listed species.	CD [LRP]	Long-term
1.20		Conduct coastal dredging in accordance with the U.S. Army Corps of Engineers and California Department of Fish and Game requirements in order to avoid impacts to sensitive fish and bird species.	PW [E]	Ongoing
1.21		Work with State Parks on restoring the Alessandro Lagoon and pursue funding cooperatively.	PW [P]	Long-term
1.22		Adopt development code provisions to protect mature trees as defined by minimum height, canopy, and/or tree trunk diameter.	CD [LRP]	Short-term
1.23		Require, where appropriate, the preservation of healthy tree windrows associated with current and former agricultural uses, and incorporate trees into the design of new developments.	CD [CP]	Short-term
1.24		Require new development to maintain all indigenous tree species or provide adequately sized replacement native trees on a 3:1 basis.	CD [CP]	Ongoing
1.25		Purchase and use recycled materials and alternative and renewable energy sources as feasible in	AS [P]	Ongoing

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Number	Action	Lead Entity	Timeframe
	City operations.		
1.26	Reduce pesticide use in City operations.	PW [P]	Mid-term
1.27	Utilize green waste as biomass/compost in City operations.	PW [P]	Mid-term
1.28	Purchase low-emission City vehicles, and convert existing gasoline-powered fleet vehicles to cleaner fuels as technology becomes available.	PW [MS]	Mid-term
1.29	Require all City funded projects that enter design and construction after January 1, 2006 to meet a design construction standard equivalent to the minimum U.S. Green Building Council LEED™ Certified rating in accordance with the City's Green Building Standards for Private and Municipal Construction Projects.	FD [IS]	Short-term
1.30	Provide information to businesses about how to reduce waste and pollution and conserve resources.	PW [MS]	Short-term
1.31	Provide incentives for green building projects in both the public and private sectors to comply with either the LEED™ Rating System, California Green Builder, or the Residential Built Green program and to pursue registration and certification; incentives include "Head-of-the-Line" discretionary processing and "Head-of-the-Line" building permit processing.	FD [IS]	Short-term
1.32	Apply for grants, rebates, and other funding to install solar panels on all City-owned structures to provide at least half of their electric energy requirements.	PW	Ongoing

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Number	Action	Lead Entity	Timeframe
1.33	Publicly acknowledge individuals and businesses that implement green construction and building practices.	FD [IS]	Ongoing
2.1	Track economic indicators for changes that may affect City land resources, tax base, or employment base, such as terms and conditions of sale or lease of available office, retail, and manufacturing space.	CD [ED]	Ongoing
2.2	Prepare an economic base analysis that identifies opportunities to capture retail sales in sectors where resident purchasing has leaked to other jurisdictions.	CD [ED]	Short-term
2.3	Maintain and update an Economic Development Strategy to implement City economic goals and objectives.	CD [ED]	Ongoing
2.4	Map priority locations for commercial and industrial development and revitalization, including a range of parcel sizes targeted for high-technology, non-durables manufacturing, finance, business services, tourism, and retail uses.	CD	Short-term
2.5	Share economic and demographic information with organizations that may refer businesses to Ventura.	CD [ED]	Ongoing
2.6	Encourage intensification and diversification of uses and properties in districts, corridors, and neighborhood centers, including through assembly of vacant and underutilized parcels.	CD [ED]	Ongoing

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Number	Action	Lead Entity	Timeframe
2.7	Partner with local commerce groups to recruit companies and pursue funding for business development and land re-utilization.	CD [ED]	Ongoing
2.8	Carry out Housing Element programs that provide housing to all segments of the local workforce.	CD	Ongoing
2.9	Expedite review for childcare facilities that will provide support to local employees.	CD [CP]	Short-term
2.10	Expedite review of the entitlement process for installation of infrastructure necessary to support high technology and multimedia companies.	CA	Mid-term
2.11	Allow mixed-use development in commercial and industrial districts as appropriate.	CD [LRP]	Short-term
2.12	Allow uses such as conference centers with resort amenities on appropriately sized and located parcels.	CD [LRP]	Short-term
2.13	Market the city to businesses that link agriculture with high technology, such as biotechnology enterprises.	CD [ED]	Ongoing
2.14	Partner with local farms to promote farmers markets and high quality locally grown food.	CS	Ongoing
2.15	Provide incentives for use of waterfront parcels for recreation, visitor-serving commerce, restaurant, marina, and fishing uses.	CD [ED]	Short-term
2.16	Work with the State to create year-round commercial opportunities at the fairgrounds.	CD [ED]	Long-term

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Number	Action	Lead Entity	Timeframe
2.17	Partner with the Harbor District and National Park Service to promote Channel Islands tours and develop a marine learning center.	CS	Long-term
2.18	Prioritize uses within the Harbor Specific Plan area as follows: (1) coastal dependent, (2) commercial fishing, (3) coastal access, and (4) visitor serving commercial and recreational uses.	CD	Short-term
2.19	Partner with hotels and the Chamber of Commerce to promote city golf courses.	CS [GS/AS]	Long-term
2.20	Promote outdoor recreation as part of an enhanced visitor opportunity strategy.	CS	Mid-term
3.1	Preserve the stock of existing homes by carrying out Housing Element programs.	CD	Ongoing
3.2	Enhance the appearance of districts, corridors, and gateways (including views from highways) through controls on building placement, design elements, and signage.	CD [LRP]	Short-term
3.3	Require preservation of public view sheds and solar access.	CD [CP]	Short-term
3.4	Require all shoreline development (including anti-erosion or other protective structures) to provide public access to and along the coast, unless it would duplicate adequate access existing nearby, adversely affect agriculture, or be inconsistent with public safety, military security, or protection of fragile coastal resources.	CD [CP]	Ongoing
3.5	Establish land development incentives to upgrade the appearance of poorly maintained or	FD [IS]	Mid-term

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Number	Action	Lead Entity	Timeframe
	otherwise unattractive sites, and enforce existing land maintenance regulations.		
3.6	Expand and maintain the City's urban forest and thoroughfare landscaping, using native species, in accordance with the City's Park and Development Guidelines and Irrigation and Landscape Guidelines.	PW [P]	Ongoing
3.7	Evaluate whether lot coverage standards should be changed based on neighborhood character.	CD [LRP]	Short-term
3.8	Adopt new development code provisions that designate neighborhood centers, as depicted on the General Plan Diagram, for a mixture of residences and small-scale, local-serving businesses.	CD [LRP]	Short-term
3.9	Adopt new development code provisions that designate areas within districts and corridors for mixed-use development that combines businesses with housing and focuses on the redesign of single-use shopping centers and retail parcels into walkable, well connected blocks, with a mix of building types, uses, and public and private frontages.	CD [LRP]	Short-term
3.10	Allow intensification of commercial areas through conversion of surface parking to building area under a districtwide parking management strategy in the Downtown Specific Plan.	CD [LRP]	Short-term
3.11	Expand the downtown redevelopment area to include parcels around future transit areas and along freeway frontage.	CD [RDA]	Mid-term
3.12	The City will work with the hospitals on the new Development Code treatment for the Loma Vista corridor, which includes both hospitals.	CD [LRP]	Short-term

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3.13	Assess whether the City's Affordable Housing Programs respond to current needs, and modify them as necessary within State mandated Housing Element updates	CD	Ongoing
3.14	Utilize infill development, to the extent possible, to accommodate the targeted number and type of housing units described in the Housing Element	CD [LRP]	Ongoing
3.15	Adopt new development code provisions that ensure compliance with Housing Element objectives.	CD [LRP]	Short-term
3.16	Renew and modify greenbelt agreements as necessary to direct development to already urbanized areas.	CD [LRP]	Long-term
3.17	Continue to support the Guidelines for Orderly Development as a means of implementing the General Plan, and encourage adherence to these Guidelines by all the cities, the County of Ventura, and the Local Agency Formation Commission (LAFCO); and work with other nearby cities and agencies to avoid sprawl and preserve the rural character in areas outside the urban edge.	CD [LRP]	Ongoing
3.18	Complete community or specific plans, subject to funding, for areas such as Westside, Midtown, Downtown, Wells, Saticoy, Pierpont, Harbor, Loma Vista/Medical District, Victoria Corridor, and others as appropriate. These plans will set clear development standards for public and private investments, foster neighborhood partnerships, and be updated as needed.	CD [LRP]	Ongoing
3.19	Preparation of the new Development Code will take into account existing or proposed community or specific plans to ensure efficient use of City resources and ample citizen input.	CD [LRP]	Short-term

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Number	Action	Lead Entity	Timeframe
3.20	Pursuant to SOAR, adopt development code provisions to "preserve agricultural and open space lands as a desirable means of shaping the City's internal and external form and size, and of serving the needs of the residents."	CD [LRP]	Short-term
3.21	Adopt performance standards for non-farm activities in agricultural areas that protect and support farm operations, including requiring non-farm uses to provide all necessary buffers as determined by the Agriculture Commissioner's Office.	CD [LRP]	Short-term
3.22	Offer incentives for agricultural production operations to develop systems of raw product and product processing locally.	CD [ED]	Mid-term
3.23	Develop and adopt a form-based Development Code that emphasizes pedestrian orientation, integration of land uses, treatment of streetscapes as community living space, and environmentally sensitive building design and operation.	CD [LRP]	Short-term
3.24	Revise the Residential Growth Management Program (RGMP) with an integrated set of growth management tools including: • Community or specific plans and development codes based on availability of infrastructure and transit that regulate community form and character by directing new residential development to appropriate locations and in ways that integrate with and enhance existing neighborhoods, districts and corridors; • appropriate mechanisms to ensure that new residential development produces high-quality	CD [LRP]	Short-term

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	designs and a range of housing types across all income levels; and, • numeric limitations linked to the implementation of community or specific plans and development codes and the availability of appropriate infrastructure and resources; within those limitations, the RGMP should provide greater flexibility for timing new residential development.		
3.25	Establish first priority growth areas to include the districts, corridors, and neighborhood centers as identified on the General Plan Diagram; and second priority areas to include vacant undeveloped land when a community plan has been prepared for such (within the City limits).	CD [LRP]	Short-term
3.26	Establish and administer a system for the gradual growth of the City through identification of areas set aside for long-term preservation, for controlled growth, and for encouraged growth.	CD [LRP]	Mid-term
3.27	Require the use of techniques such as digital simulation and modeling to assist in project review.	CD [CP]	Short-term
3.28	Revise the planning processes to be more user-friendly to both applicants and neighborhood residents in order to implement City policies more efficiently.	CD [CP]	Short-term
4. OUR ACCESSIBLE COMMUNITY			
4.1	Direct city transportation investment to efforts that improve user safety and keep the circulation system structurally sound and adequately maintained. First priority for capital funding will go to our pavement management program to return Ventura streets to excellent conditions.	PW [E]	Ongoing

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4.2	Develop a prioritized list of projects needed to improve safety for all travel modes and provide needed connections and multiple route options.	PW [E]	Short-term
4.3	Provide transportation services that meet the special mobility needs of the community including youth, elderly, and disabled persons.	PW [E]	Ongoing
4.4	Combine education with enforcement to instill safe and courteous use of the shared public roadway.	CS	Ongoing
4.5	Utilize existing roadways to meet mobility needs, and only consider additional travel lanes when other alternatives are not feasible.	CD [LRP]	Ongoing
4.6	Require new development to be designed with interconnected transportation modes and routes to complete a grid network.	CD [CP]	Short-term
4.7	Update the traffic mitigation fee program to fund necessary citywide circulation system and mobility improvements needed in conjunction with new development.	CD [LD]	Short-term
4.8	Implement the City's Neighborhood Traffic Management Program and update as necessary to improve livability in residential areas.	PW [E]	Ongoing
4.9	Identify, designate, and enforce truck routes to minimize the impact of truck traffic on residential neighborhoods.	PW [E]	Ongoing
4.10	Modify traffic signal timing to ensure safety and minimize delay for all users.	PW [E]	Short-term

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4.11	Refine level of service standards to encourage use of alternative modes of transportation while meeting state and regional mandates.	PW [E]	Short-term
4.12	Design roadway improvements and facility modifications to minimize the potential for conflict between pedestrians, bicycles, and automobiles.	PW [E]	Ongoing
4.13	Require project proponents to analyze traffic impacts and provide adequate mitigation in the form of needed improvements, in-lieu fee, or a combination thereof.	CD [LD]	Ongoing
4.14	Provide development incentives to encourage projects that reduce automobile trips.	CD [CP]	Short-term
4.15	Encourage the placement of facilities that house or serve elderly, disabled, or socioeconomically disadvantaged persons in areas with existing public transportation services and pedestrian and bicycle amenities.	CD [CP]	Ongoing
4.16	Install roadway, transit, and alternative transportation improvements along existing or planned multi-modal corridors, including primary bike and transit routes, and at land use intensity nodes.	PW [E]	Ongoing
4.17	Prepare and periodically update a Mobility Plan that integrates a variety of travel alternatives to minimize reliance on any single mode.	CD [LRP]	Short-term
4.18	Promote the development and use of recreational trails as transportation routes to connect housing with services, entertainment, and employment.	PW [P]	Ongoing
4.19	Adopt new development code provisions that establish vehicle trip reduction requirements for all development.	CD [LRP]	Short-term

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4.20	Develop a transportation demand management program to shift travel behavior toward alternative modes and services.	PW [E]	Mid-term
4.21	Require new development to provide pedestrian and bicycle access and facilities as appropriate, including connected paths along the shoreline and watercourses.	PW [E/P]	Short-term
4.22	Update the General Bikeway Plan as needed to encourage bicycle use as a viable transportation alternative to the automobile and include the bikeway plan as part of a new Mobility Plan.	PW [E]	Mid-term
4.23	Upgrade and add bicycle lanes when conducting roadway maintenance as feasible.	PW [E]	Ongoing
4.24	Require sidewalks wide enough to encourage walking that include ramps and other features needed to ensure access for mobility-impaired persons.	PW [E]	Short-term
4.25	Adopt new development code provisions that require the construction of sidewalks in all future projects, where appropriate.	CD [LRP]	Short-term
4.26	Establish a parking management program to protect the livability of residential neighborhoods, as needed.	CD [LRP]	Short-term
4.27	Extend stubbed-end streets through future developments, where appropriate, to provide necessary circulation within a developing area and for adequate internal circulation within and between neighborhoods. Require new developments in the North Avenue area, where applicable, to extend Norway Drive and Floral Drive to connect to Canada Larga Road; and connect the existing segments of Floral Drive. Designate the extension of Cedar Street between Warner Street and	PW [E]	Mid-term

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	south of Franklin Lane and the linking of the Cameron Street segments in the Westside community as high priority projects.		
4.28	Require all new development to provide for citywide improvements to transit stops that have sufficient quality and amenities, including shelters and benches, to encourage ridership.	PW [E]	Short-term
4.29	Develop incentives to encourage City employees and local employers to use transit, rideshare, walk, or bike.	HR	Mid-term
4.30	Work with public transit agencies to provide information to riders at transit stops, libraries, lodging, and event facilities.	PW [E]	Ongoing
4.31	Work with public and private transit providers to enhance public transit service.	PW [E]	Mid-term
4.32	Coordinate with public transit systems for the provision of additional routes as demand and funding allow.	PW [E]	Long-term
4.33	Work with Amtrak, Metrolink, and Union Pacific to maximize efficiency of passenger and freight rail service to the City and to integrate and coordinate passenger rail service with other transportation modes.	PW [E]	Mid-term
4.34	Lobby for additional transportation funding and changes to Federal, State, and regional transportation policy that support local decision-making.	PW [E]	Ongoing
4.35	The City shall pursue funding and site location for a multi-modal transit facility in coordination with VCTC, SCAT, U.P.R.R., Metrolink, Greyhound Bus Lines, and other forms of	PW [E]	Mid-term

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Number	Action	Lead Entity	Timeframe
	transportation.		
4.36	Require development along the following roadways – including noise mitigation, landscaping, and advertising – to respect and preserve views of the community and its natural context. • State Route 33 • U.S. HWY 101 • Anchors Way • Brakey Road • Fairgrounds Loop • Ferro Drive • Figueroa Street • Harbor Boulevard • Main Street • Navigator Drive • North Bank Drive • Poli Street/Foothill Road • Olivas Park Drive • Schooner Drive	CD [CP]	Ongoing

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	• Spinnaker Drive • Summit Drive • Telegraph Road – east of Victoria Avenue • Victoria Avenue – south of U.S. 101 • Wells Road		
4.37	Request that State Route 126 and 33, and U.S. HWY 101 be designated as State Scenic Highways.	CD [LRP]	Short-term
4.38	Continue to work with Caltrans to soften the barrier impact of U.S. HWY 101 by improving signage, aesthetics and undercrossings and overcrossings.	PW [E/P]	Ongoing
4.39	Maintain street trees along scenic thoroughfares, and replace unhealthy or missing trees along arterials and collectors throughout the City.	PW [P]	Ongoing
5. OUR SUSTAINABLE INFRASTRUCTURE			
5.1	Require low flow fixtures, leak repair, and drought tolerant landscaping (native species if possible), plus emerging water conservation techniques, such as reclamation, as they become available.	CD [CP]	Ongoing
5.2	Use natural features such as bioswales, wildlife ponds, and wetlands for flood control and water quality treatment when feasible.	PW [MS/P]	Ongoing
5.3	Demonstrate low water use techniques at community gardens and city-owned facilities.	PW [U/P]	Mid-term

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5.4	Update the Urban Water Management plan as necessary in compliance with the State 1983 Urban Water Management Planning Act.	PW [U]	Ongoing
5.5	Provide incentives for new residences and businesses to incorporate recycling and waste diversion practices, pursuant to guidelines provided by the Environmental Services Office.	PW [MS]	Ongoing
5.6	Require project proponents to conduct sewer collection system analyses to determine if downstream facilities are adequate to handle the proposed development.	PW [U]	Ongoing
5.7	Require project proponents to conduct evaluations of the existing water distribution system, pump station, and storage requirements in order to determine if there are any system deficiencies or needed improvements for the proposed development.	PW [U]	Ongoing
5.8	Locate new development in or close to developed areas with adequate public services, where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.	CD [LRP]	Ongoing
5.9	Update development fee and assessment district requirements as appropriate to cover the true costs associated with development.	AS	Mid-term
5.10	Utilize existing waste source reduction requirements, and continue to expand and improve composting and recycling options.	PW [MS]	Mid-term
5.11	Increase emergency water supply capacity through cooperative tie-ins with neighboring suppliers.	PW [U]	Mid-term
5.12	Apply new technologies to increase the efficiency of the wastewater treatment system.	PW [U]	Mid-term

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5.13	Increase frequency of city street sweeping, and post schedules at key points within each neighborhood.	PW [MS]	Mid-term
5.14	Develop a financing program for the replacement of failing corrugated metal storm drain pipes in the City.	PW [MS]	Short-term
5.15	Establish assessment districts or other financing mechanisms to address storm drain system deficiencies in areas where new development is anticipated and deficiencies exist.	PW [MS]	Mid-term
5.16	Require new developments to incorporate stormwater treatment practices that allow percolation to the underlying aquifer and minimize offsite surface runoff utilizing methods such as pervious paving material for parking and other paved areas to facilitate rainwater percolation and retention/detention basins that limit runoff to pre-development levels.	CD [LD]	Ongoing
5.17	Require stormwater treatment measures within new development to reduce the amount of urban pollutant runoff in the Ventura and Santa Clara Rivers and other watercourses.	CD [LD]	Ongoing
5.18	Work with the Ventura Regional Sanitation District and the County to expand the capacity of existing landfills, site new landfills, and/or develop alternative means of disposal that will provide sufficient capacity for solid waste generated in the City.	PW [MS]	Long-term

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6. OUR ACTIVE COMMUNITY			
6.1	Develop new neighborhood parks, pocket parks, and community gardens as feasible and appropriate to meet citizen needs, and require them in new development.	PW [P]	Long-term
6.2	Require higher density development to provide pocket parks, tot lots, seating plazas, and other aesthetic green spaces.	CD [CP]	Short-term
6.3	Work with the County to plan and develop trails that link the City with surrounding open space and natural areas, and require development projects to include trails when appropriate.	PW [P]	Ongoing
6.4	Request Flood Control District approval of public access to unchannelized watercourses for hiking.	PW [P]	Mid-term
6.5	Seek landowner permission to allow public access on properties adjacent to open space where needed to connect trails.	PW [P]	Ongoing
6.6	Update plans for and complete the linear park system as resources allow.	PW [P]	Long-term
6.7	Work with the County of Ventura to initiate efforts to create public trails in the hillside area.	PW [P]	Mid-term
6.8	Update and require periodic reviews of the Park and Recreation Workbook as necessary to reflect City objectives and community needs.	PW [P]	Mid-term
6.9	Require dedication of land identified as part of the City's Linear Park System in conjunction with new development.	PW [P]	Ongoing

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6.10	Evaluate and incorporate, as feasible, linear park segments in the General Bikeway Plan.	PW [E]	Ongoing
6.11	Update standards for citywide public parks and open space to include an expanded menu of shared park types, and identify locations and potential funding sources for acquiring new facilities in existing neighborhoods.	PW [P]	Short-term
6.12	Update and carry out the Grant Park Master Plan.	PW [P]	Mid-term
6.13	Foster the partnership between the City and Fair Board to improve Seaside Park.	CD [ED]	Ongoing
6.14	Improve facilities at City parks to respond to the requirements of special needs groups.	PW [P]	Mid-term
6.15	Adjust and subsidize fees to ensure that all residents have the opportunity to participate in recreation programs.	CS [CR]	Short-term
6.16	Update the project fee schedule as necessary to ensure that development provides its fair share of park and recreation facilities.	PW [P]	Short-term
6.17	Update and create new agreements for joint use of school and City recreational and park facilities.	CS [CR] PW [P]	Mid-term
6.18	Offer programs that highlight natural assets, such as surfing, sailing, kayaking, climbing, gardening, and bird watching.	CS [CR]	Ongoing
6.19	Provide additional boating and swimming access as feasible.	PW	Long-term

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6.20	Earmark funds for adequate maintenance and rehabilitation of existing skatepark facilities, and identify locations and funding for new development of advanced level skatepark facilities.	PW [P]	Mid-term
6.21	Promote the use of City facilities for special events, such as festivals, tournaments, and races.	CS [CA]	Ongoing
6.22	Enter into concession or service agreements where appropriate to supplement City services.	PW	Ongoing
7. OUR HEALTHY AND SAFE COMMUNITY			
7.1	Work with interested parties to identify appropriate locations for assisted-living, hospice, and other care-provision facilities.	CS [SS]	Short-term
7.2	Provide technical assistance to local organizations that deliver health and social services to seniors, homeless persons, low-income citizens, and other groups with special needs.	CS [SS]	Ongoing
7.3	Participate in school and agency programs to: ♦ provide healthy meals, ♦ combat tobacco, alcohol, and drug dependency, ♦ distribute city park and recreation materials through schools, and ♦ distribute information about the benefits of proper nutrition and exercise.	CS [SS]	Ongoing
7.4	Enhance or create ordinances which increase control over ABC licensed premises.	PD	Mid-term
7.5	Investigate the creation of new land use fees to enhance funding of alcohol related enforcement, prevention and training efforts.	PD	Mid-term

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Number	Action	Lead Entity	Timeframe
7.6	Adopt updated editions of the California Construction Codes and International Codes as published by the State of California and the International Code Council respectively.	FD [IS]	Ongoing
7.7	Require project proponents to perform geotechnical evaluations and implement mitigation prior to development of any site: • with slopes greater than 10 percent or that otherwise have potential for landsliding, • along bluffs, dunes, beaches, or other coastal features • in an Alquist-Priolo earthquake fault zone or within 100 feet of an identified active or potentially active fault, • in areas mapped as having moderate or high risk of liquefaction, subsidence, or expansive soils, • in areas within 100-year flood zones, in conformance with all Federal Emergency Management Agency regulations.	CD [CP/LD]	Ongoing
7.8	To the extent feasible, require new critical facilities (hospital, police, fire, and emergency service facilities, and utility "lifeline" facilities) to be located outside of fault and tsunami hazard zones, and require critical facilities within hazard zones to incorporate construction principles that resist damage and facilitate evacuation on short notice.	FD	Ongoing
7.9	Maintain and implement the Standardized Emergency Management System (SEMS) Multihazard Functional Response Plan.	FD	Ongoing

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Number	Action	Lead Entity	Timeframe
7.10	Require proponents of any new developments within the 100-year floodplain to implement measures, as identified in the Floodplain Ordinance, to protect structures from 100-year flood hazards (e.g., by raising the finished floor elevation outside the floodplain).	FD [IS]	Ongoing
7.11	Prohibit grading for vehicle access and parking or operation of vehicles within any floodway.	FD [IS]	Ongoing
7.12	Refer development plans to the Fire Department to assure adequacy of structural fire protection, access for firefighting, water supply, and vegetation clearance.	CD [CP]	Ongoing
7.13	Resolve extended response time problems by: • adding a fire station at the Pierpont/Harbor area, • relocating Fire Station #4 to the Community Park site, • increasing firefighting and support staff resources, • reviewing and conditioning annexations and development applications, and • require the funding of new services from fees, assessments, or taxes as new subdivisions are developed.	FD	Long-term
7.14	Educate and reinforce City staff understanding of the Standardized Emergency Management System for the State of California.	FD	Ongoing
7.15	Increase public access to police services by: • increasing police staffing to coincide with increasing population, development, and calls for	PD	Ongoing

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Number	Action	Lead Entity	Timeframe
	service, • increasing community participation by creating a Volunteers in Policing Program, and • require the funding of new services from fees, assessments, or taxes as new subdivisions are developed.		
7.16	Provide education about specific safety concerns such as gang activity, senior-targeted fraud, and property crimes.	PD	Ongoing
7.17	Establish a nexus between police department resources and increased service demands associated with new development.	PD	Mid-term
7.18	Continue to operate the Downtown police storefront.	PD	Ongoing
7.19	Expand Police Department headquarters as necessary to accommodate staff growth	PD	Mid-term
7.20	Require air pollution point sources to be located at safe distances from sensitive sites such as homes and schools.	FD [IS]	Short-term
7.21	Require analysis of individual development projects in accordance with the most current version of the Ventura County Air Pollution Control District Air Quality Assessment Guidelines and, when significant impacts are identified, require implementation of air pollutant mitigation measures determined to be feasible at the time of project approval.	FD [IS]	Ongoing
7.22	In accordance with Ordinance 93-37, require payment of fees to fund regional transportation demand	CD [LD]	Ongoing

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Number	Action	Lead Entity	Timeframe
	management (TDM) programs for all projects generating emissions in excess of Ventura County Air Pollution Control District adopted levels.		
7.23	Require individual contractors to implement the construction mitigation measures included in the most recent version of the Ventura County Air Pollution Control District Air Quality Assessment Guidelines.	PW [E]	Ongoing
7.24	Only approve projects involving sensitive land uses (such as residences, schools, daycare centers, playgrounds, medical facilities) within or adjacent to industrially designated areas if an analysis provided by the proponent demonstrates that the health risk will not be significant.	CD [CP]	Ongoing
7.25	Adopt new development code provisions that ensure uses in mixed-use projects do not pose significant health effects.	CD [LRP]	Short-term
7.26	Seek funding for cleanup of sites within the Brownfield Assessment Demonstration Pilot Program and other contaminated areas in West Ventura.	CD [ED]	Mid-term
7.27	Require proponents of projects on or immediately adjacent to lands in industrial, commercial, or agricultural use to perform soil and groundwater contamination assessments in accordance with American Society for Testing and Materials standards, and if contamination exceeds regulatory action levels, require the proponent to undertake remediation procedures prior to grading and development under the supervision of the County Environmental Health Division, County Department of Toxic Substances Control, or Regional Water Quality Control Board (depending	FD [IS]	Ongoing

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Number	Action	Lead Entity	Timeframe
	upon the nature of any identified contamination).		
7.28	Educate residents and businesses about how to reduce or eliminate the use of hazardous materials, including by using safer non-toxic equivalents.	PW [MS]	Ongoing
7.29	Require non-agricultural development to provide buffers, as determined by the Agriculture Commissioner's Office, from agricultural operations to minimize the potential for pesticide drift.	CD [CP]	Short-term
7.30	Require all users, producers, and transporters of hazardous materials and wastes to clearly identify the materials that they store, use, or transport, and to notify the appropriate City, County, State and Federal agencies in the event of a violation.	FD [IS]	Ongoing
7.31	Work toward voluntary reduction or elimination of aerial and synthetic chemical application in cooperation with local agricultural interests and the Ventura County agricultural commissioner.	FD [IS]	Mid-term
7.32	Require acoustical analyses for new residential developments within the mapped 60 decibel (dBA) CNEL contour, or within any area designated for commercial or industrial use, and require mitigation necessary to ensure that: • Exterior noise in exterior spaces of new residences and other noise sensitive uses that are used for recreation (such as patios and gardens) does not exceed 65 dBA CNEL, and • Interior noise in habitable rooms of new residences does not exceed 45 dBA CNEL with all windows closed.	FD [IS]	Ongoing

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Number	Action	Lead Entity	Timeframe
7.33	As funding becomes available, construct sound walls along U.S. 101, SR 126, and SR 33 in areas where existing residences are exposed to exterior noise exceeding 65 dBA CNEL.	PW [E]	Long-term
7.34	Request that sound levels associated with concerts at the County Fairgrounds be limited to 70 dBA at the eastern edge of that property.	CS	Short-term
7.35	Request the termination of auto racing at the County fairgrounds	CS	Short-term
7.36	Amend the noise ordinance to restrict leaf blowing, amplified music, trash collection, and other activities that generate complaints.	FD [IS]	Short-term
7.37	Use rubberized asphalt or other sound reducing material for paving and re-paving of City streets.	PW [E]	Ongoing
7.38	Update the Noise Ordinance to provide standards for residential projects and residential components of mixed-use projects within commercial and industrial districts.	CD [LRP]	Short-term
8.1	Work closely with schools, colleges, and libraries to provide input into site and facility planning.	CS	Ongoing
8.2	Organize a regional education summit to generate interest in and ideas about learning opportunities.	CS	Mid-term
8.3	Adopt joint-use agreements with libraries, schools, and other institutions to maximize use of educational facilities.	CS	Mid-term
8.4	Distribute information about local educational programs.	CS	Mid-term

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Number	Action	Lead Entity	Timeframe
8.5	Install infrastructure for wireless technology and computer networking in City facilities.	AS	Short-term
8.6	Establish educational centers at City parks.	PW [P] CS	Mid-term
8.7	Work with the State Parks Department to establish a marine learning center at the Harbor.	PW [P]	Long-term
8.8	Work with the Ventura Unified School District to ensure that school facilities can be provided to serve new development.	CD [LRP]	Ongoing
8.9	Complete a new analysis of community needs, rethinking the role of public libraries in light of the ongoing advances in information technology and the changing ways that individuals and families seek out information and life-long learning opportunities.	CS	Mid-term
8.10	Reassess the formal and informal relationships between our current three branch public libraries and school libraries – including the new Ventura College Learning Resource Center – as well as joint use of facilities for a broader range or compatible public, cultural, and educational uses.	CS	Mid-term
8.11	Develop a Master Plan for Facilities, Programs, and Partnerships to create an accessible, robust, and vibrant library for the 21st Century system, taking into consideration that circulation of books is no longer the dominant function but will continue to be an important part of a linked network of learning centers.	CS	Mid-term
8.12	Develop formal partnerships, funding, capital strategies, and joint use agreements to implement the	CS	Ongoing

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Number	Action	Lead Entity	Timeframe
	new libraries Master Plan.		
9. OUR CREATIVE COMMUNITY			
9.1	Require works of art in public spaces per the City's Public Art Program Ordinance.	CD [CP]	Mid-term
9.2	Sponsor and organize local art exhibits, performances, festivals, cultural events, and forums for local arts organizations and artists.	CS	Ongoing
9.3	Expand outreach and publicity by: ♦ promoting locally produced art and local cultural programs, ♦ publishing a monthly calendar of local art and cultural features, ♦ distributing the *State of the Arts* quarterly report, and ♦ offering free or subsidized tickets to events.	CS	Ongoing
9.4	Support the creative sector through training and other professional development opportunities.	CS	Short-term
9.5	Work with the schools to integrate arts education into the core curriculum	CS	Short-term
9.6	Promote the cultural and artistic expressions of Ventura's underrepresented cultural groups.	CS	Mid-term
9.7	Offer ticket subsidy and distribution programs and facilitate transportation to cultural offerings.	CS	Ongoing
9.8	Increase the amount of live-work development, and allow its use for production, display, and sale of	CD [LRP]	Ongoing

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Number	Action	Lead Entity	Timeframe
	art.		
9.9	Work with community groups to locate sites for venues for theater, dance, music, and children's programming.	CS [CR]	Mid-term
9.10	Provide incentives for preserving structures and sites that are representative of the various periods of the city's social and physical development.	CD [LRP]	Mid-term
9.11	Organize and promote multi-cultural programs and events that celebrate local history and diversity.	CS [CA]	Ongoing
9.12	Allow adaptive reuse of historic buildings.	CD [LRP]	Short-term
9.13	Work with community groups to identify locations for facilities that celebrate local cultural heritage, such as a living history Chumash village and an agricultural history museum.	CS [CA]	Long-term
9.14	Require archaeological assessments for projects proposed in the Coastal Zone and other areas where cultural resources are likely to be located.	CD [CP]	Ongoing
9.15	Suspend development activity when archaeological resources are discovered, and require the developer to retain a qualified archaeologist to oversee handling of the resources in coordination with the Ventura County Archaeological Society and local Native American organizations as appropriate.	CD [CP]	Ongoing
9.16	Pursue funding to preserve historic resources.	CS	Ongoing

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Number	Action	Lead Entity	Timeframe
9.17	Provide incentives to owners of eligible structures to seek historic landmark status and invest in restoration efforts.	CD [LRP]	Short-term
9.18	Require that modifications to historically-designated buildings maintain their character.	CD [CP]	Ongoing
9.19	For any project in a historic district or that would affect any potential historic resource or structure more than 40 years old, require an assessment of eligibility for State and federal register and landmark status and appropriate mitigation to protect the resource.	CD [CP]	Ongoing
9.20	Seek input from the City's Historic Preservation Commission on any proposed development that may affect any designated or potential landmark.	CD [CP]	Ongoing
9.21	Update the inventory of historic properties.	CD [LRP]	Ongoing
9.22	Create a set of guidelines and/or policies directing staff, private property owners, developers, and the public regarding treatment of historic resources that will be readily available at the counter.	CD [LRP]	Short-term
9.23	Complete and maintain historic resource surveys containing all the present and future components of the historic fabric within the built, natural, and cultural environments.	CD [LRP]	Ongoing
9.24	Create a historic preservation element.	CD [LRP]	Long-term
10. OUR INVOLVED COMMUNITY			
10.1	Conduct focused outreach efforts to encourage all members of the community – including youth, seniors, special needs groups, and non-English speakers – to participate in City activities.	CM [CE]	Short-term

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Number	Action	Lead Entity	Timeframe
10.2	Obtain public participation by seeking out citizens in their neighborhoods and gathering places such as schools, houses of worship and public spaces.	CM [CE]	Ongoing
10.3	Invite civic, neighborhood, and non-profit groups to assist with City project and program planning and implementation.	CD	Ongoing
10.4	Provide incentives for City staff to participate in community and volunteer activities.	HR	Short-term
10.5	Invite seniors to mentor youth and serve as guides at historical sites.	CS	Short-term
10.6	Offer internships in City governance, and include youth representatives on public bodies.	CS	Mid-term
10.7	Continue to offer the Ambassadors program to obtain citizens assistance with City projects.	PW	Ongoing
10.8	Utilize the City website as a key source of information and expand it to serve as a tool for civic engagement.	CM [CE]	Short-term
10.9	Publish an annual report that evaluates City performance in such areas as conservation, housing, and economic development.	CD	Mid-term
10.10	Continue to improve the user-friendliness of the media that communicate information about the City, including the website, cable channels, newsletters, kiosks, and water billing statements.	CM [CE]	Short-term
10.11	Establish a clear policy toward the scope, role, boundaries, and jurisdiction of neighborhood Community Councils citywide, with the objectives of strengthening their roles in decision-making.	CD [LRP]	Mid-term

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Number	Action	Lead Entity	Timeframe
10.12	Establish stronger partnerships with neighborhood Community Councils to set area priorities for capital investment, community policing, City services, commercial investment, physical planning, education, and other concerns, to guide both City policies and day-to-day cooperation and problem-solving.	CD [LRP]	Ongoing
10.13	Recognizing that neighborhood empowerment must be balanced and sustained by overall City policies and citywide vision and resources – establish a citywide Neighborhood Community Congress where local neighborhood Community Councils can collaborate and learn from each other.	CM[CE]	Mid-term
10.14	Establish clear liaison relationships to foster communication, training, and involvement efforts between the City, neighborhood Community Councils and other community partners, including the Ventura Unified School District and business, civic, cultural and religious groups.	CM [CE]	Short-term

ORDINANCE NO. 95-33

AN ORDINANCE OF THE PEOPLE OF THE CITY OF SAN BUENAVENTURA ADOPTING AN ORDINANCE AMENDING THE COMPREHENSIVE PLAN WITH RESPECT TO THE PRESERVATION OF AGRICULTURAL LANDS.

The people of the City of San Buenaventura do hereby ordain as follows:

Section 1. Findings and Purpose.

A. The protection of existing agricultural and watershed lands is of critical importance to present and future residents of the City of San Buenaventura (City of Ventura). Agriculture has been and remains the major contributor to the economy of the City and County of Ventura, creating employment for many people, directly and indirectly, and generating substantial tax revenues for the City.

B. In particular, the City of Ventura and surrounding area, with its unique combination of soils, micro-climate and hydrology, has become one of the finest growing regions in the world. Vegetable and fruit production from the County of Ventura and in particular production from the soils and silt from the Santa Clara and Ventura rivers have achieved international acclaim, enhancing the City's economy and reputation.

C. Uncontrolled urban encroachment into agricultural and watershed areas will impair agriculture and threaten the public health, safety and welfare by causing increased traffic congestion, associated air pollution, and potentially serious water problems, such as pollution, depletion, and sedimentation of available water resources. Such urban encroachment would eventually result in both the unnecessary, expensive extension of public services and facilities and inevitable conflicts between urban and agricultural uses.

D. The unique character of the City of Ventura and quality of life of City residents depend on the protection of a substantial amount of open space lands. The protection of such lands not only ensures the continued viability of agriculture, but also protects the available water supply and contributes to flood control and the protection of wildlife, environmentally sensitive areas, and irreplaceable natural resources.

E. The Resolution by which the City of Ventura adopted its Comprehensive Plan on August 28, 1989, Resolution No. 89-103, at page 4, contains in part the following "mitigation measures" in recognition of the importance of preserving agriculture resources:

> "Any potential significant adverse impacts are mitigated by substantially limiting the amount of agricultural land converted from an agricultural land use designation limiting the amount of prime farmland converted, and by making the various agricultural land areas designated for potential development subject to conditions which narrowly limit the possible land use."

F. The Comprehensive Plan sets out as Objective 4 (at II-9) the desire to:

"Continue to preserve agricultural and other open space lands within the City's Planning Area."

And, the Comprehensive Plan describes as the first Goal of its Resource Element (at II-3) the objective to:

> "Preserve agricultural and open space lands as a desirable means of shaping the City's internal and external form and size, and of serving the needs of residents."

G. The purpose of this initiative is to ensure that the Goals and Objectives of the Comprehensive Plan are inviolable by transitory short-term political decisions and that agricultural, watershed and open space lands are not prematurely or unnecessarily converted to other non-agricultural or non-open space uses without public debate and a vote of the people. Accordingly, the initiative ensures that until December 31, 2030, the general plan provisions governing agricultural land use designation and intent may not be change except by vote of the people. In addition, the initiative provides that any lands designated as "Agriculture Use", referring to both "Agricultural Use (not to be reconsidered until after the Year 2010" and Agricultural/Institutional" on the City of Ventura's General Plan "Land Use Plan Map" adopted by the City Council by Resolution 89-103 on August 28, 1989, as amended through February 1, 1995, will remain designated as Agricultural Use until December 31, 2030, unless the land is redesignated to another land use category by vote of the people, or redesignated by the City Council for the City of San Buenaventura pursuant to the procedures set forth in this initiative.

H. This initiative allows the City Council to redesignate agriculture lands only if certain if certain findings can be made, including (among other things) that the land is proven to be unsuitable for any form of agriculture and redesignation is necessary to avoid an unconstitutional taking of property without just compensation.

Section 2. General Plan Amendment.

The Agricultural Lands Preservation Initiative hereby reaffirms and readopts until December 31, 2030, The "Agricultural Use" designations as defined in the City of San Buenaventura Comprehensive Plan adopted August 28, 1989, as amended through February 1, 1995, at pages III-25 and III-26, with the modification that the "target date" is extended from 2010 until after December 31, 2030.

The following terminology shall replace the current "Agricultural Use" designation defined at page III-25 of The Plan:

Agricultural Use

The Agricultural Use (not to be reconsidered until after the Year 2030) category identifies those lands that are designated for agricultural use on the Land Use Plan Map.

The target date of 2030 associated with the Agricultural Use designation indicates a review date after which agriculturally designated lands may be reconsidered for urban uses. However, during the life of this plan as amended by initiative, it is intended that only agricultural uses are permitted on these lands, except as such lands may be appropriate to public open space and recreational usage. Furthermore, any updates to this Plan are not intended to imply that development would necessarily be appropriate at hat time.

In addition, the initiative hereby reaffirms and readopts until December 31, 2030, the "Agricultural" designations set forth on the of the City of Ventura Comprehensive Plan "Land Use Plan Map" adopted by the City Council on August 28, 1989, as amended through February 1, 1995, which map is incorporated herein by reference, modified, as appropriate, to delete the reference year 2010 and replace it with the reference year 2030.

Finally, the text of the Amendment Procedures of the City of Ventura Comprehensive Plan adopted August 28, 1989, as amended through February 1, 1995, (at XI-I) shall be amended to add a new subsection which provides:

Limitation on General Plan Amendments Relating to "Agricultural Use"

a) Until December 31, 2030, the provisions and designations governing the intent for lands designated "Agricultural Use" of the Land Use Element and Resource Element adopted on August 28, 1989, as amended through February 1, 1995, shall not be amended unless such amendment is approved by vote of the people.

b) All those lands designated as "Agricultural Use" in the City of Ventura Comprehensive Plan "Land Use Plan Map" adopted by the City Council on August 28, 1989 as amended through February 1, 1995, shall remain so designated until December 31, 2030 unless redesignated to another general plan land use category by vote of the people, or redesignated by the City Council pursuant to the procedures set forth in subsections c) or d), below.

c) Except as provided in subsection d), below, land designated as "Agricultural Use" may be redesignated by the City Council to a land use other than "Agricultural Use" as defined by the Comprehensive Plan adopted by the City Council on August 28, 1989, as amended through February 1, 1995, only if the City Council makes all of the following findings supported by the evidence:

   i) The land is immediately adjacent to areas developed in a manner comparable to the proposed use;

   ii) Adequate public services and facilities are available and have the capacity and capability to accommodate the proposed use;

   iii) The proposed use is compatible with agricultural uses, does not interfere with accepted agricultural practices, and does not adversely affect the stability of land use patterns in the area;

   iv) The land proposed for redesignation has not been used for agricultural purposes in the past 2 years and is unusable for agriculture due to its topography, drainage, flooding, adverse soil conditions or other physical reasons; and

v) The land proposed for redesignation pursuant to this subsection (c) does not exceed 40 acres for any one landowner in any calendar year, and one landowner may not obtain redesignation in the Comprehensive Plan of "Agricultural Use" land pursuant to this subsection (c) more often than every other year. Landowners with any unity of interest are considered one landowner for purposes of this limitation.

d) Land designated as "Agricultural Use" on the Land Use Plan Map may be redesignated to another land use category by the City Council if each of the following conditions are satisfied:

i) The City Council makes a finding that the application of the provisions of Section 2 (a) would constitute an unconstitutional taking of the landowners' property; and

ii) In permitting the redesignation, the City Council allows additional land uses only to the extent necessary to avoid said unconstitutional taking of the landowner's property.

e) Approval by a vote of the people is accomplished when a Comprehensive Plan amendment is placed on the ballot through any procedure provided for in the Election Code, and a majority of the voters vote in favor of it. Whenever the City Council adopts an amendment requiring approval by a vote of the people pursuant to the provisions of this subsection, the City Council's action shall have no effect until after such a vote is held and a majority of the voters vote in favor of it. The City Council shall follow the provisions of the Election Code in all matters pertaining to such an election.

Section 3. Implementation.

A. Upon the effective date of this initiative, the initiative shall be deemed inserted in the City of Ventura's Comprehensive Plan as an amendment thereof; except, that if the four amendments of the mandatory elements of the general plan permitted by state law for any given calendar year have already been utilized in 1995, prior to the effective date of this initiative, this Comprehensive Plan amendment shall be deemed inserted in the City's General Plan on January 1, 1996. At such time as this Comprehensive Plan amendment is deemed inserted in the City's Comprehensive Plan (hereinafter, the "insertion date") any provisions of the City's Zoning Ordinance inconsistent with that amendment shall not be enforced to the extent of the inconsistency. Within 180 days of the insertion date, the City shall complete

such revisions of its Comprehensive Plan, including, but not limited to, the Comprehensive Plan Land Use Plan Map adopted by the City Council on August 28, 1989, (as amended through February 1, 1995) and accompanying test, as are necessary to achieve consistency with all provisions of this initiative. Also, within 180 days of the insertion date, the City Council shall complete such revisions of its Zoning Ordinance and other land use regulations as are necessary to conform to and be consistent with all provisions of this initiative.

B. The provisions of this initiative shall prevail over any revisions to the City of Ventura's Comprehensive Plan as amended through February 1, 1995, or to the City of Ventura's Land Use Plan Map as amended through February 1, 1995 which conflict with the initiative. Except as provided in Section 4 below, upon the specific plans, tentative or final subdivision maps, parcel maps, conditional use permits, building permits or other ministerial or discretionary entitlements for use not yet approved or issued shall not be approved or issued unless consistent with the policies and provisions of this initiative.

Section 4. Exemptions for Certain Projects.

This initiative shall not apply to or affect any property owner whose property has acquired any of the following prior to its effective date:

A. A vested right pursuant to state law;

B. A validly approved and fully executed development agreement with the City; or

C. Approval of a vesting tentative map.

Section 5. Severability.

If any portion of this initiative is declared invalid by a court, the remaining portions are to be considered valid.

Section 6. Amendment or Repeal.

This initiative may be amended or repealed only by the voters at a general election.

STATE OF CALIFORNIA)
COUNTY OF VENTURA) ss
CITY OF SAN BUENAVENTURA)

I, BARBARA J. KAM, City Clerk of the City of San Buenaventura, California, do hereby certify that the foregoing Ordinance was adopted by the voters of the City of San Buenaventura at the General Municipal Election held on November 7, 1995 and subsequently declared adopted by the City Council of the City of San Buenaventura on November 27, 1995. The Ordinance shall take effect December 7, 1995. This ordinance shall not be repealed or amended except by a vote of the people, unless provision is otherwise made in the original ordinance.

Dated this 30th day of November, 1995.

Barbara J. Kam, CMC
City Clerk

Ventura Hillside Voter Participation Measure

The people of the City of San Buenaventura do ordain as follows:

Section 1. Title

This measure shall be known as the Ventura Hillside Voter Participation Measure.

Section 2. Purpose

The overall purpose of this measure is to allow City voters to participate in the review process relating to non-exempt development projects that may be proposed in a certain portion of the "Hillside Area" of the City as defined in the City's Comprehensive Plan Update to the Year 2010 (hereafter the "Comprehensive Plan"). The portion of the Hillside Area under consideration lies generally north of the City, constitutes an area approximately 9108 acres in size, and is further depicted as the "Hillside Voter Participation Area" indicated in Exhibit "A" attached hereto and made a part hereof. The proposed Hillside Voter Participation Area (also referred to from time to time hereafter as "HVP Area" or "HVPA") is outside the Ventura City limits, but it is within the "Planning Area" of the City of San Buenaventura as further indicated on Exhibit "A." The Comprehensive Plan Land Use Map currently designates the properties within the proposed Hillside Voter Participation Area as "Hillside Planned Residential" or "HPR" rather than "Agricultural" and, therefore, these properties are not subject to the Save Our Agricultural Resources ("SOAR") Initiative adopted by the voters in 1995.

In the recent past, some property owners within the proposed Hillside Voter Participation Area have publicly presented initial proposals to develop those properties with a combination of residential uses and open space and recreational areas proposed to include, among other things, hiking and equestrian trails for use by the public. In the course of public meetings and informational workshops discussing these proposals, it has become apparent that there is a high level of public concern over potential issues of scenic resource protection, open space and recreational opportunities, infrastructure needs, traffic circulation, and other development-related issues arising from any proposed changes in the use of this important part of the City's Planning Area. This measure, in recognition of this heightened public concern, is intended to provide the electorate of the City of San Buenaventura with an opportunity to vote on the approval of any such development proposals or any similar proposals to extend urban services to the Hillside Voter Participation Area or develop property in the Hillside Voter Participation Area with urbanized land uses.

More particularly, this measure proposes to amend the Comprehensive Plan of the City of San Buenaventura by adding a requirement that approvals for extensions of "urban services" (defined in the City's Hillside Management Program as the provision of domestic water and sewers) or any proposed "urbanized uses of land" (as defined herein) in the Hillside Voter Participation Area cannot be granted without prior approval by a majority vote of the electorate.

Section 3. Comprehensive Plan Amendment

The following text shall be inserted into the Land Use Element of the Comprehensive Plan at page 111-8 thereof:

Hillside Voter Participation Area

The electorate of the City of Ventura has adopted a Hillside Voter Participation Area (Ventura HVP Area). Its purpose, principles, implementation procedures, and methodologies for amendment are set forth in this Comprehensive Plan amendment.

A. PURPOSE

The City of Ventura Hillside Area, with its unique topography, viewsheds, watershed lands; its unique microclimate and hydrology, and its diversity of plant and wildlife resources, is one of the finest scenic resources in the Southern California region. The Comprehensive Plan recognizes the unique and important qualities and potential of the Hillside Area in, among other provisions, the declaration of specialized Objectives and Policies for the Hillside Area in the Resources Element of the Plan and the Plan's requirements for continuing operation of, and compliance with, the City's Hillside Management Program.

This Comprehensive Plan amendment is intended to provide for an increased level of public awareness and participation in the development review process applicable to that portion of the Hillside Area described and depicted in Exhibit "A" as the "Hillside Voter Participation Area." It is further intended to provide assurance to the public that any proposed development in the Hillside Voter Participation Area appropriately takes into account the Area's unique combination of viewshed, watershed, open space, scenic area, and environmentally sensitive habitat, and that agricultural, viewshed, watershed, and open space lands in the Hillside Voter Participation Area are not converted to urban or other non-open space uses without public discussion and a vote of the people. Increasing citizen participation in the development review process through the establishment of a Hillside Voter Participation Area enhances the City's sense of community, allows for development unique to the City of Ventura, and promotes the efficient use of the City's infrastructure.

More specifically, this Comprehensive Plan amendment is intended to provide an opportunity for the public to be involved in insuring that any development projects proposed in the Hillside Voter Participation Area, shall, at a minimum:

1. Maintain the scenic character of the hillsides in areas of future development, by preserving significant natural landmarks and scenic ridgelines and slopes.

2. Provide increased recreational opportunities for existing and future hillside and other City residents, by improving access to existing parks and establishing additional parks or open, non-developed areas in conjunction with future hillside development.

3. Maximize public access to hillside open space and recreation areas, by establishing a system of linear parks and hiking trails along scenic ridges and barrancas.

4. Minimize the impact of hillside development on sensitive natural habitats and historical or archaeological resources.

B. PRINCIPLES

Inappropriate urban encroachment into Hillside open space, viewshed, watershed, scenic areas, and biological resource areas would have the potential to impact sensitive environmental areas, unwarrantedly intrude on open space, diminish the quality of life and threaten the public health, safety and welfare by leading to increased traffic congestion, associated air pollution, erosion, alteration of sensitive lands in watershed areas and causing potentially serious water problems, such as pollution, depletion and sedimentation of available water resources not only for the City of Ventura, but for its jurisdictional neighbors. Inappropriate urban encroachment could further result in the unwarranted extension of public services and facilities into sensitive areas.

The unique character of the City of Ventura and quality of life of City residents depends on the appropriate protection of the Hillside Area's substantial amount of open space, viewshed, watershed, scenic resources, and biological resources. The increased public awareness and involvement in the fate of such lands through the implementation of this Comprehensive Plan amendment will provide the public a special opportunity to assure that future generations of Ventura citizens will not be deprived of the benefits of access to a viable water supply, flood and erosion control, protection of viewsheds, wildlife, environmentally sensitive areas, open space and recreational areas, and irreplaceable natural resources.

C. IMPLEMENTATION

(1) There is hereby established a Ventura Hillside Voter Participation Area (Ventura HVP Area). The Ventura HVP Area is that portion of the Hillside Area delineated and depicted in Exhibit "A" of this Comprehensive Plan amendment (hereafter, the "HVP Area Map"). As shown on the HVP Area Map, the southern boundary of the HVP Area generally follows the northern segment of the City's incorporated limit as established by the Local Agency Formation Commission for the City of Ventura, except as the HVP boundary line runs northerly of some small residential lots on or near Foothill Road west of Arroyo Verde Park as further depicted on Exhibit "A." East of Harmon Barranca, the HVP Area boundary generally follows the alignment of Foothill Road eastward to the boundary of the City's Planning Area. The northerly boundary of the HVP Area continues, generally, as the northern boundary of the City's Planning Area. The westerly boundary of the HVP Area alternately follows the City limit boundary or Sphere of Influence boundary easterly of the North Avenue area. The foregoing narrative description is intended to be general in nature and all of the foregoing is more particularly depicted and described in Exhibit "A'

Insofar as the HVP Area boundary described and depicted in this Comprehensive Plan amendment, including Exhibit "A" hereto, is said or shown to be coterminous with either the City's incorporated limit or the City's Sphere of Influence boundary, or with the boundary of the City's Planning Area, such references are intended to be, and shall be construed to be, the location of the City limit boundary or Sphere of Influence boundary or boundary of the City's Planning Area. as applicable, as each of those boundaries are established for the City of Ventura as of January 1, 2001. Although the HVP Area boundary is established, in part, in generally the same location as the City limit boundary, or in some instances, the Sphere of Influence boundary, the establishment of the HVP Area boundary is not intended to and shall in no way inhibit the Local Agency Formation Commission from changing or altering the City limit boundary or Sphere of Influence boundary in accordance with State law. The boundary of the HVP Area, although incidentally coterminous as of one point in time with the City limit boundary or Sphere of Influence boundary or boundary of the City's Planning Area, is independent from these boundaries in legal significance and purpose. While the City limit boundary or Sphere of Influence boundary may be, from time to time, altered by the Local Agency Formation Commission, or the boundary of the City's Planning Area may be changed, the HVP Area boundary shall not be changed except as provided herein.

(2) Until December 31, 2030, the City of Ventura shall not extend urban services into, and shall not authorize urbanized uses of land within, the Ventura Hillside Voter Participation Area unless otherwise authorized by a vote of the people, except for the purpose of construction of public potable water facilities, public parks or other city government facilities or as otherwise provided or excepted herein. Upon the effective date of this Hillside Voter Participation Area Comprehensive

Plan amendment, the City and its departments, boards, commissions, officers and employees shall not grant, or by inaction allow to be approved by operation of law, any Comprehensive Plan amendment, rezoning, specific plan, subdivision map, conditional use permit, building permit or any other ministerial or discretionary entitlement, which is inconsistent with the purposes of this Comprehensive Plan amendment, unless in accordance with the amendment procedures of Section 4 of this Comprehensive Plan amendment.

(3) "Urbanized uses of land" shall mean any development that would require the establishment of new community sewer systems or the significant expansion of existing community sewer systems; or, would result in the creation of residential densities greater than one primary residential unit per 40 acres in area; or, would result in the establishment of commercial or industrial uses that are neither agriculturally-related nor related to the production of mineral resources.

(4) The Land Use Map is amended to reflect the existence of the Ventura Hillside Voter Participation Area as generally described in paragraph (1) above and as depicted in Exhibit "A," attached hereto.

(5) The Hillside Voter Participation Area, as defined herein, may not be amended, altered, revoked or otherwise changed prior to December 31, 2030, except by vote of the people or by the City Council pursuant to the procedures set forth in Section 4 of this Comprehensive Plan amendment. For purposes of this Ordinance, approval by a vote of the people is accomplished when a Comprehensive Plan amendment is placed on the ballot through any procedure provided for in the Election Code, and a majority of the voters vote in favor of it. Whenever the City Council adopts an amendment requiring approval by a vote of the people pursuant to the provisions of this subsection, the City Council's action shall have no effect until after such a vote is held and a majority of the voters vote in favor of it. The City Council shall follow the provisions of the Election Code in all matters pertaining to such an election.

Section 4. Changes to Area: Procedures.

Until December 31, 2030, the foregoing Purposes, Principles and Implementation provisions of this Comprehensive Plan amendment, and the Hillside Voter Participation Area may be amended only by a vote of the people commenced pursuant to the initiative process by the public, or pursuant to the procedures set forth below:

A. The City Council may amend the boundary of the Hillside Voter Participation Area depicted on Exhibit "A" if it finds such amendment to be in the public interest, provided that the amended boundary enlarges said Hillside Voter Participation Area established by this Comprehensive Plan amendment.

B. The City Council, following at least one public hearing for presentation by an applicant and the public, and after compliance with the California Environmental Quality Act, may amend the Hillside Voter Participation Area described herein, based on substantial evidence in the record, if the City Council makes each of the following findings:

(1) Application of the provisions of subsections (A) or (B) of the amendment procedures set forth in this Section 4 are unworkable and failure to amend the Hillside Voter Participation Area would constitute an unconstitutional taking of a landowner's property for which compensation would be required or would deprive the landowner of a vested right; and

(2) The amendment and associated land use designations will allow additional land uses only to the minimum extent necessary to avoid said
unconstitutional taking of the landowner's property or to give effect to the vested right.

C. The City Council, following at least one public hearing for presentations by an applicant and the public, and after compliance with the California Environmental Quality Act, may place any amendment to the Hillside Voter Participation Area or the provisions of this Comprehensive Plan amendment on the ballot pursuant to the mechanisms provided by state law.

D. The Comprehensive Plan may be reorganized and individual provisions, including the provisions of this ordinance, maybe renumbered or reordered in the course of ongoing updates of the Comprehensive Plan in accordance with the requirements of state law.

Section 5. No Changes to Save Our Agricultural Resources Initiative

Any restrictions imposed upon the City of San Buenaventura limiting the City's ability to redesignate, or allow development of, property designated "Agricultural" that are in effect as a result of the "SOAR" initiative approved by the voters in 1995 and adopted by the City Council as Ordinance No. 95-33 shall remain in full force and effect and shall not be amended, modified, altered, or abridged by the adoption of this ordinance.

Section 6. Exemptions:

The provisions of this ordinance do not apply to:

A. Construction or reconstruction of, or related to, public potable water facilities, public: parks or other city government facilities; or

B. Construction or reconstruction of no more than one residential dwelling unit, and incidental uses or structures related thereto, on an individual parcel of land that is lawfully established of record as of the effective date of this Comprehensive Plan amendment and that is contiguous to the City's incorporation boundary but only to the extent that such a legally established parcel is developed with, or proposed to be developed with, no more than one residential dwelling unit; or

C. Any development that would result in the creation of residential densities equal to or less than one primary residential unit per 40 acres in area; or, would result in the establishment of commercial or industrial uses that are agriculturally-related or related to the production of mineral resources; or

D. Any development project that has obtained, as of the effective date of this Comprehensive Plan amendment, a vested right pursuant to state or local law; or

E. Uses that are "incidental' (as the City's Zoning Ordinance defines "incidental uses") to uses lawfully established as of the effective date of this Comprehensive Plan amendment.

Section 7. Interpretation

This ordinance shall be broadly construed in order to achieve the purposes stated in this ordinance. It is the intent of the voters that the provisions of this measure shall be interpreted by the City and others in a manner that promotes public participation in decision-making relating to future development proposals within in the Hillside Voter Participation Area.

Section 8. Insertion Date

A. Upon the effective date of this ordinance, Sections 3, 4, 5, 6, and 7 of this ordinance shall be deemed inserted in the Comprehensive Plan and the Land Use Map referred to in Part C of Section 3 shall be deemed amended even though the reprinting may not occur until it can be carried out by the staff of the City of San Buenaventura.

B. The Comprehensive Plan in effect at the time the City Council decided to place this measure on the ballot, and the Comprehensive Plan as amended by this ordinance, comprise an integrated, internally consistent and compatible statement of policies for the City of San Buenaventura. In order to ensure that the Comprehensive Plan remains an integrated, internally consistent and compatible statement of policies and to ensure that the actions of the voters in enacting this ordinance are given effect, any provision of the Comprehensive Plan that is adopted between July 23, 2001 and the effective date of this ordinance, to the extent that such provision is inconsistent with this ordinance, shall be amended as soon as possible and in the manner and time required by state law to ensure consistency between such provision and Section 3 of this ordinance. In the alternative, such interim-enacted inconsistent provisions shall be repealed.

Section 9. Amendment or Repeal

This ordinance may be amended or repealed only by the voters of the City of San Buenaventura at an election held in accordance with state law, except as expressly provided by Section 4 herein.

The people of the City of San Buenaventura do ordain as follows:

Section 1. Title

This measure shall be known as the Ventura Community Park SOAR Amendment.

Section 2. Purpose

The purpose of this measure is to allow the City to develop a Community Park on a parcel of property located at the northwest corner of the intersection of Kimball Road and Telephone Road. The subject property, which is approximately 100 acres in size, is further described in Exhibit "A," attached hereto and made a part hereof, and is hereafter referred to as the "Property." Most of the Property is outside the Ventura City limits but within the "Planning Area" of the City of San Buenaventura and therefore covered by the City's Comprehensive Plan Update to the Year 2010 (hereafter the "Comprehensive Plan"). The Property is currently designated "Agricultural" under the Comprehensive Plan and, therefore, also subject to the 1995 Save Our Agricultural Resources ("SOAR") Initiative.

The City is proposing to develop the Property with community-oriented public park facilities that may include, among other things, athletic fields, an aquatic facility, a community center and other related buildings and structures for use by the public. If this measure is approved, the City may also construct and operate a fire station on a portion of the Property.

This initiative proposes to amend the Comprehensive Plan of the City of San Buenaventura, by changing the designation of the Property in the Comprehensive Plan Land Use Plan Map from "Agricultural" (or "A") to "Parks" (or "P"). This will allow the City of San Buenaventura to potentially develop the Property with a Community Park without being restricted by the SOAR Initiative.

Section 3. Comprehensive Plan Amendment

Part A.

The following paragraph titled “Parks Uses” is hereby added to the Land Use Element of the Comprehensive Plan, more particularly, to the provisions of the Serra Community Intent and Rationale Statement on page III-96, to read as follows:

“Parks Uses: The Parks Land Use Plan designation is applied to an approximately 100-acre site at the northwest corner of Kimball Road and Telephone Road for the purpose of developing a multi-purpose community-oriented public park on this site. It is further intended that this site should be zoned to the “P” (Parks) zone if and when it is annexed to the City. Design Review should be carried out by the City's Planning Commission prior to the development of any Recreation Services use types on the site to assure that the range of community park uses potentially permitted on the site by the "P" zone are well integrated on the site and compatible with adjacent land uses.”

Part B.

The Property is deleted from the discussion of “Agricultural Uses” in the Serra Community provisions of the Land Use Element of the Comprehensive Plan. To that end, the final paragraph with the heading “Agricultural Use” beginning at the bottom of page III-95 and ending at the top of page III-96 is hereby revised to read as follows:

“Agricultural Use: A 297-acre area between Telephone Road and the Southern Pacific Railroad and a 172-acre area between Bristol Road and the Santa Clara River are designated Agricultural Use, not to be reconsidered until after the Year 2010, to preserve their existing agricultural character.”

Part C.

The Land Use Plan Map incorporated in the Comprehensive Plan is hereby amended, and official copies thereof shall be revised by City staff, to reflect the foregoing amendments to the text of the Land Use Element.

Section 4. Zoning

Upon annexation to the City of San Buenaventura, the zoning classification for the Property shall be "P" (Parks) and the Official Zoning District Map incorporated in the Zoning Ordinance shall, by this Measure, be amended, and official copies thereof shall be revised by City staff, to reflect the foregoing zone change to the Property.

Section 5. Save Open-Space and Agricultural Resources

Any restrictions imposed upon the City of San Buenaventura limiting the City's ability to redesignate, or allow development of, property designated "Agricultural" that are in effect on the day that this Initiative is approved by the voters shall remain in full force and effect except as to the Property. The City of San Buenaventura may allow development of a community park on the Property in accordance with this ordinance.

Section 6. Interpretation

This ordinance shall be broadly construed in order to achieve the purposes stated in this ordinance. It is the intent of the voters that the provisions of this ordinance shall be interpreted by the City of San Buenaventura and others in a manner that facilitates the development of a community park on the Property in accordance with the purposes of this ordinance.

Section 7. Insertion Date

Part A. Upon the effective date of this ordinance, Part A and Part B of Section 3 of this ordinance shall be deemed inserted in the Comprehensive Plan and the Land Use Map referred to in Part C of Section 3 shall be deemed amended even though the reprinting may not occur until it can be carried out by the staff of the City of San Buenaventura.

Part B. The Comprehensive Plan in effect at the time the City Council decided to place this measure on the ballot, and the Comprehensive Plan as amended by this ordinance, comprise an integrated, internally consistent and compatible statement of policies for the City of San Buenaventura.

In order to ensure that the Comprehensive Plan remains an integrated, internally consistent and compatible statement of policies and to ensure that the actions of the voters in enacting this ordinance are given effect, any provision of the Comprehensive Plan that is adopted between [the date the City Council decided to place this measure on the ballot] and the effective date of this ordinance, to the extent that such provision is inconsistent with this ordinance, shall be amended as soon as possible and in the manner and time required by state law to ensure consistency between such provision and Section 3 of this ordinance. In the alternative, such interim-enacted inconsistent provisions shall be repealed.

Section 8. Amendment or Repeal

Section 3 and Section 4 of this ordinance may be amended or repealed only by the voters of the City of San Buenaventura at an election held in accordance with state law.

The people of the City of San Buenaventura do ordain as follows:

Section 1. Title

This ordinance shall be known as the First Assembly of God Land Initiative.

Section 2. Purpose

The purpose of this ordinance is to allow the First Assembly of God (hereafter "Church") to develop a property located at the northwest corner of the intersection of Montgomery Avenue and Northbank Drive. Such property is 25.59 acres and is further described in Exhibit A, attached hereto and made a part hereof, and is hereafter referred to as "Property". The Church wishes to develop the Property in accordance with City of San Buenaventura Ordinance No 95-33 (commonly known as "SOAR") guidelines for a sanctuary, related Church buildings, and athletic fields for use by the community of San Buenaventura.

Since the Property is within the sphere of influence of the City of San Buenaventura, this ordinance (1) amends the Comprehensive Plan Update to the Year 2010 (hereafter the "General Plan") of the City of San Buenaventura, and (2) prezones the Property to the R-1 Single Family zone with a subzone of R-1-1AC. This will allow the City of San Buenaventura to annex the Property with a restricted land use that is compatible with the Church's development of the Property.

Section 3. General Plan Amendment

Part A.

The second paragraph under the heading "Residential Uses" appearing on page III-94 of the General Plan describes the areas that may be used for low-density, single family homes in the Serra Community area of the City of San Buenaventura. The single family use (designated as SF in the General Plan) is the most restrictive land use that will allow the Church to build a sanctuary, related church buildings, and athletic fields. Section 4 of this initiative will further restrict the Property by pre-zoning the Property and requiring a minimum of one acre for each parcel. This will make the Property unattractive for single family development but still acceptable for the Church sanctuary, related Church buildings, and athletic fields. This ordinance adds the Church's 25.59 acre parcel to the SF land use.

The second paragraph under the heading "Residential Uses" appearing on page III-94 of the General Plan is hereby amended to read as follows:

"The SF category is applied to an approximately 3-acre site at the southeast corner of Henderson and Petit Avenue, a 1.7-acre site southerly of Darling Road extended, and a 25.59-acre site located at the northwest corner of Montgomery Avenue and Northbank Drive."

Part B.

The final paragraph with the heading "Agricultural Use" beginning at the bottom of page III-95 and ending at the top of page III-96 of the General Plan describes that portion of the Serra Community area of the City of San Buenaventura which may only be used for agricultural uses. This ordinance deletes the Church's 25.59 acre parcel from the agricultural use category.

The final paragraph with the heading "Agricultural Use" beginning at the bottom of page III-95 and ending at the top of page III-96 of the General Plan is hereby amended to read as follows:

"Agricultural Use: A 100-acre site at the northwest corner of Kimball Road and Telephone, a 297-acre area between Telephone Road and the Southern Pacific Railroad except for the 25.59-acre site located at the northwest corner of Montgomery Avenue and Northbank Drive, and a 172-acre area between Bristol Road and the Santa Clara River are designated Agricultural Use, not to be reconsidered until after the Year 2010, to preserve their existing agricultural character."

Part C.

The map of the Land Use Plan contained in the General Plan shall be redrafted to reflect the foregoing amendments.

Section 4. Zoning

The most restrictive zoning in the City of San Buenaventura which will allow the Church to build a sanctuary, related Church buildings, and athletic fields on the Property is an R-1 Single Family zone with a subzone of R-1-1AC. The R-1-1AC subzone restricts the Property by requiring a minimum of one acre for each parcel. This will make the Property unattractive for single family development but still acceptable for the Church's sanctuary, related Church buildings, and athletic fields.

Therefore, upon annexation of the Property to the City of San Buenaventura the zoning designation for the Property shall be the R-1 Single Family zone with a subzone of R-1-1AC.

Section 5. Save Open-Space and Agricultural Resources

Any restrictions imposed upon he City of San Buenaventura limiting the City's ability to annex property and allow development of such property shall remain in full force and effect except as to the 25.59-acres of the Property.

Section 6. Construction

This ordinance shall be broadly construed in order to achieve the purposes stated in this ordinance. It is the intent of the voters that the provisions of this ordinance shall be interpreted by the City of San Buenaventura and others in a manner that facilitates the development of the Property in accordance with the purposes of this ordinance.

Section 7. Insertion Date

Part A. Upon the effective date of this ordinance, Part A and Part B of Section 3 of this ordinance shall be deemed inserted in the General Plan and the Land Use Map referred to in Part C of Section 3 shall be deemed amended even though the reprinting may not occur until deemed convenient by the City of San Buenaventura.

Part B. The General Plan in effect at the time the Notice of Intention to circulate this initiative was submitted to the City Clerk of the City of San Buenaventura, and the General Plan as amended by this ordinance, comprise an integrated, internally consistent and compatible statement of policies for the City of San Buenaventura. In order to ensure that the General Plan remains an integrated, internally consistent and compatible statement of policies and to ensure that the actions of the voters in enacting this ordinance are given effect, any provision of the General Plan that is adopted between the Notice of Intention and the effective date of this ordinance, to the extent that such provision is inconsistent with this ordinance, shall be amended as soon as possible and in the manner and time required by state law to ensure consistency between such provision and Section 3 of this ordinance. In the alternative, such interim-enacted inconsistent provisions shall be repealed.

Section 8. Amendment or Repeal

Section 3 and Section 4 of this ordinance may be amended or repealed only by the voters of the City of San Buenaventura at an election held in accordance with state law.

EXHIBIT "A"

PARCEL 1:

That portion of Subdivision 98 of Rancho Santa Paula y Saticoy, in the county of Ventura, state of California, as per map recorded in book "A" pag3 290 of Miscellaneous Records (Transcribed Records from Santa Barbara County), in the office of the county recorder of said county, described as follows:

Beginning at the point of intersection of the centerline of the right of way of the Southern Pacific Railroad and the boundary line between Subdivisions 98 and 99 of said Rancho Santa Paula y Saticoy; thence from said point of beginning,

1st: - North 10° 30' West 9.482 chains, more or less, to the southeast corner of that certain Parcel of land conveyed to Charles H. Fowler, by deed dated March 18, 1892, recorded in book 36 page 86 of Deeds; thence,

2nd: - South 79º 30' West 19.25 chains, along the south line of said lands of Charles H. Fowler, to the northeast corner of that certain Parcel of land as conveyed to Emma J. Tyler, by deed dated June 20, 1894, recorded in book 43 page 90 of Deeds; thence,

3rd: - South 10º 30' East 18.982 chains, more or less, along the east line of said lands of Emma J. Tyler, to a point in the centerline of the right of way of the Southern Pacific Railroad; thence along same,

4th: - North 53º 15' East 22.57 chains, more or less, to the point of beginning.

EXCEPT a strip of parcel of land 50 feet wide lying adjoining and immediately west of the east line of the above described land, conveyed to the County of Ventura, as a public highway, by deed recorded July 12, 1889, in book 28 page 338 of Deeds.

ALSO EXCEPT that portion thereof conveyed to the Southern Pacific Railroad Company by deed recorded January 27, 1887 in book 18 page 146 of Deeds.

RESERVING unto the grantor herein, all oil, gas and mineral rights in and to said land, without however, any right of surface entry in and to a depth of 500 feet.

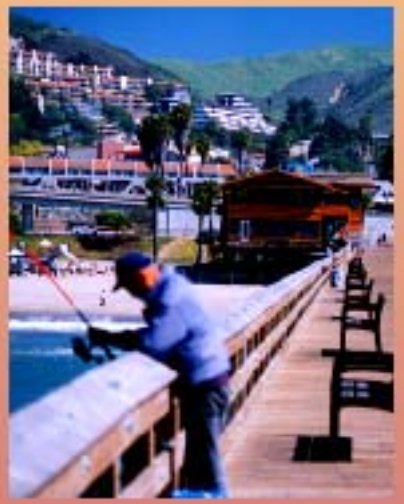
PARCEL 3:

That certain parcel in Lot 99 of the Rancho Santa Paula y Saticoy, marked “not a part of this subdivision” on the map of Tract No. 1333-1, in the City of San Buenaventura, county of Ventura, state of California, as per map recorded in book 30 page 51 of Maps, in the office of the county recorder of said county, and lying northwesterly of the Southern Pacific Railroad right of way, easterly of Bristol Road and southwesterly of Montgomery Avenue, as shown on said map.

RESERVING unto the grantor herein, all oil, gas and mineral rights in and to said land, without however, any right of surface entry in and to a depth of 500 feet from the surface thereof.

ventura's general plan

ATTACHMENTS



"The desire for community is a constant of human nature."

— Steven Price
Urban Advantage
Berkeley, California

CITY OF
VENTURA

21ST CENTURY TOOL KIT

Prelude

The 2005 Ventura General Plan envisions a new direction to protect and preserve its citizens' quality of life. This direction is based on the recognition that zoning and land development, as practiced for the past several decades, has not served our citizens, our city, or our environment as well as it should.

Currently, the two most successful movements created to alleviate this situation are "Smart Growth" and "New Urbanism." Smart Growth is a government initiated approach against sprawl that addresses underlying policy from the top-down, and is primarily marketed by government and similar agencies. New Urbanism is a grass roots, market response to outdated zoning and land use policy as it impacts development and the physical properties of the public realm. Its chief advocates are architects and town designers.

Smart Growth grew out of early New Urbanist work, and both are concerned with the real outcomes of the built environment and how it affects communities environmentally, economically, culturally, and socially.

The Ahwahnee Principles and the Charter for the New Urbanism, listed below, were created early on as "constitutions" that governed these movements. Both are valuable tools that Ventura would be wise to include in it's 21st Century Tool Kit to understand and solve long-standing problems associated with growth and change.

AHWAHNEE PRINCIPLES

Preamble:

Existing patterns of urban and suburban development seriously impair our quality of life. The symptoms are: more congestion and air pollution resulting from our increased dependence on automobiles, the loss of precious open space, the need for costly improvements to roads and public services, the inequitable distribution of economic resources, and the loss of a sense of community. By drawing upon the best from the past and the present, we can plan communities that will more successfully serve the needs of those who live and work within them. Such planning should adhere to certain fundamental principles.

Community Principles

1. All planning should be in the form of complete and integrated communities containing housing, shops, work places, schools, parks and civic facilities essential to the daily life of the residents.

2. Community size should be designed so that housing, jobs, daily needs and other activities are within easy walking distance of each other.
3. As many activities as possible should be located within easy walking distance of transit stops.
4. A community should contain a diversity of housing types to enable citizens from a wide range of economic levels and age groups to live within its boundaries.
5. Businesses within the community should provide a range of job types for the community's residents.
6. The location and character of the community should be consistent with a larger transit network.
7. The community should have a center focus that combines commercial, civic, cultural and recreational uses.
8. The community should contain an ample supply of specialized open space in the form of squares, greens and parks whose frequent use is encouraged through placement and design.
9. Public spaces should be designed to encourage the attention and presence of people at all hours of the day and night.
10. Each community or cluster of communities should have a well-defined edge, such as agricultural greenbelts or wildlife corridors, permanently protected from development.
11. Streets, pedestrian paths and bike paths should contribute to a system of fully-connected and interesting routes to all destinations. Their design should encourage pedestrian and bicycle use by being small and spatially defined by buildings, trees and lighting; and by discouraging high speed traffic.
12. Wherever possible, the natural terrain, drainage and vegetation of the community should be preserved with superior examples contained within parks or greenbelts.
13. The community design should help conserve resources and minimize waste.
14. Communities should provide for the efficient use of water through the use of natural drainage, drought tolerant landscaping and recycling.
15. The street orientation, the placement of buildings and the use of shading should contribute to the energy efficiency of the community.

Regional Principles

1. The regional land-use planning structure should be integrated within a larger transportation network built around transit rather than freeways.
2. Regions should be bounded by and provide a continuous system of greenbelt/wildlife corridors to be determined by natural conditions.
3. Regional institutions and services (government, stadiums, museums, etc.) should be located in the urban core.
4. Materials and methods of construction should be specific to the region, exhibiting a continuity of history and culture and compatibility with the climate to encourage the development of local character and community identity.

Implementation Principles

1. The general plan should be updated to incorporate the above principles.
2. Rather than allowing developer-initiated, piecemeal development, local governments should take charge of the planning process. General plans should designate where new growth, infill or redevelopment will be allowed to occur.

3. Prior to any development, a specific plan should be prepared based on these planning principles.
4. Plans should be developed through an open process and participants in the process should be provided visual models of all planning proposals.

CONGRESS FOR THE NEW URBANISM

THE CONGRESS FOR THE NEW URBANISM views disinvestment in central cities, the spread of placeless sprawl, increasing separation by race and income, environmental deterioration, loss of agricultural lands and wilderness, and the erosion of society's built heritage as one interrelated community building challenge.

WE STAND for the restoration of existing urban centers and towns within coherent metropolitan regions, the reconfiguration of sprawling suburbs into communities of real neighborhoods and diverse districts, the conservation of natural environments, and the preservation of our built legacy.

WE RECOGNIZE that physical solutions by themselves will not solve social and economic problems, but neither can economic vitality, community stability, and environmental health be sustained without a coherent supportive physical framework.

WE ADVOCATE the restructuring of public policy and development practices to support the following principles: neighborhoods should be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice.

WE REPRESENT a broad-based citizenry, composed of public and private sector leaders, community activists, and multidisciplinary professionals. We are committed to reestablishing the relationship between the art of building and the making of community, through citizen-based participatory planning and design.

WE DEDICATE ourselves to reclaiming our homes, blocks, streets, parks, neighborhoods, districts, towns, cities, regions, and environment.

We assert the following principles to guide public policy, development practice, urban planning, and design:

The region: Metropolis, city, and town

1. Metropolitan regions are finite places with geographic boundaries derived from topography, watersheds, coastlines, farmlands, regional parks, and river basins. The metropolis is made of multiple centers that are cities, towns, and villages, each with its own identifiable center and edges.

2. The metropolitan region is a fundamental economic unit of the contemporary world. Governmental cooperation, public policy, physical planning, and economic strategies must reflect this new reality.

3. The metropolis has a necessary and fragile relationship to its agrarian hinterland and natural landscapes. The relationship is environmental, economic, and cultural. Farmland and nature are as important to the metropolis as the garden is to the house.

4. Development patterns should not blur or eradicate the edges of the metropolis. Infill development within existing urban areas conserves environmental resources, economic investment, and social fabric, while reclaiming marginal and abandoned areas. Metropolitan regions should develop strategies to encourage such infill development over peripheral expansion.

5. Where appropriate, new development contiguous to urban boundaries should be organized as neighborhoods and districts, and be integrated with the existing urban pattern. Noncontiguous development should be organized as towns and villages with their own urban edges, and planned for a jobs/housing balance, not as bedroom suburbs.

6. The development and redevelopment of towns and cities should respect historical patterns, precedents, and boundaries.

7. Cities and towns should bring into proximity a broad spectrum of public and private uses to support a regional economy that benefits people of all incomes. Affordable housing should be distributed throughout the region to match job opportunities and to avoid concentrations of poverty.

8. The physical organization of the region should be supported by a framework of transportation alternatives. Transit, pedestrian, and bicycle systems should maximize access and mobility throughout the region while reducing dependence upon the automobile.

9. Revenues and resources can be shared more cooperatively among the municipalities and centers within regions to avoid destructive competition for tax base and to promote rational coordination of transportation, recreation, public services, housing, and community institutions.

The neighborhood, the district, and the corridor

1. The neighborhood, the district, and the corridor are the essential elements of development and redevelopment in the metropolis. They form identifiable areas that encourage citizens to take responsibility for their maintenance and evolution.

2. Neighborhoods should be compact, pedestrian-friendly, and mixed-use. Districts generally emphasize a special single use, and should follow the principles of neighborhood design when possible. Corridors are regional connectors of neighborhoods and districts; they range from boulevards and rail lines to rivers and parkways.

3. Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the elderly and the young. Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips, and conserve energy.

4. Within neighborhoods, a broad range of housing types and price levels can bring people of diverse ages, races, and incomes into daily interaction, strengthening the personal and civic bonds essential to an authentic community.

5. Transit corridors, when properly planned and coordinated, can help organize metropolitan structure and revitalize urban centers. In contrast, highway corridors should not displace investment from existing centers.

6. Appropriate building densities and land uses should be within walking distance of transit stops, permitting public transit to become a viable alternative to the automobile.

7. Concentrations of civic, institutional, and commercial activity should be embedded in neighborhoods, and districts, not isolated in remote, single-use complexes. Schools should be sized and located to enable children to walk or bicycle to them.

8. The economic health and harmonious evolution of neighborhoods, districts, and corridors can be improved through graphic urban design codes that serve as predictable guides for change.

9. A range of parks, from tot-lots and village greens to ball fields and community gardens, should be distributed within neighborhoods. Conservation areas and open lands should be used to define and connect different neighborhoods and districts.

The block, the street, and the building

1. A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.

2. Individual architectural projects should be seamlessly linked to their surroundings. This issue transcends style.

3. The revitalization of urban places depends on safety and security. The design of streets and buildings should reinforce safe environments, but not at the expense of accessibility and openness.

4. In the contemporary metropolis, development must adequately accommodate automobiles. It should do so in ways that respect the pedestrian and the form of public space.

5. Streets and squares should be safe, comfortable, and interesting to the pedestrian. Properly configured, they encourage walking and enable neighbors to know each other and protect their communities.

6. Architecture and landscape design should grow from local climate, topography, history, and building practice.

7. Civic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy. They deserve distinctive form, because their role is different from that of other buildings and places that constitute the fabric of the city.

8. All buildings should provide their inhabitants with a clear sense of location, weather and time. Natural methods of heating and cooling can be more resource-efficient than mechanical systems.

9. Preservation and renewal of historic buildings, districts, and landscapes affirm the continuity and evolution of urban society.

Congress of the New Urbanism, 140 S. Dearborn St., Suite 310, Chicago, IL, 60603, (312) 551-7300
For information, visit www.cnu.org

GLOSSARY OF TERMS IN THE 2005 VENTURA GENERAL PLAN

Abbreviations

ADT: Average number of vehicle trips per day
CEQA: California Environmental Quality Act
CIP: Capital Improvements Program
CNEL: Community Noise Equivalent Level
dB: Decibel
DOF: California Department of Finance
EIR: Environmental Impact Report
FAR: Floor Area Ratio
FEMA: Federal Emergency Management Agency
LAFCo: Local Agency Formation Commission
Ldn: Day and Night Average Sound Level
Leq: Sound Energy Equivalent Level
LOS: Traffic Intersection Level of Service
RDA: City of Ventura Redevelopment Agency
SCAG: Southern California Association of Governments
SOI: Sphere of Influence
TDM: Transportation Demand Management
TOD: Transit-Oriented Development
VCOG: Ventura County Council of Governments

Definitions

Acre: Approximately 43,560 square feet.

Acres, Gross: The entire acreage of a site calculated to the centerline of proposed bounding streets and to the edge of the right-of-way of existing or dedicated streets.

Acres, Net: The portion of a site that can actually be built upon. The following generally are not included in the net acreage of a site**:** public or private road rights-of-way, public open space, and flood ways.

Action: A strategy carried out in response to adopted policy to achieve a specific goal or objective. Policies and action statements establish the "who," "how" and "when" for carrying out the "what" and "where" of goals and objectives.

Adaptive Reuse: The conversion of obsolescent or historic buildings from their original or most recent use to a new use; for example, the conversion of former hospital or school buildings to residential use, or the conversion of a historic single-family home to office use.

Affordable Housing: Housing capable of being purchased or rented by a household with very low, low, or moderate income, based on a household's ability to make monthly payments necessary to obtain housing. Housing is considered affordable when a household pays less than 30 percent of its gross monthly income (GMI) for housing including utilities.

Alley: A narrow service way, either public or private, which provides a permanently reserved but secondary means of public access not intended for general traffic circulation. Alleys typically are located along rear property lines.

Ambient: Surrounding on all sides; used to describe measurements of existing conditions with respect to traffic, noise, air and other environments.

Annex, *v*: To incorporate a land area into an existing district or municipality, with a resulting change in the boundaries of the annexing jurisdiction.

Aquifer: An underground, water-bearing layer of earth, porous rock, sand, or gravel, through which water can seep or be held in natural storage. Aquifers generally hold sufficient water to be used as a water supply.

Arterial: Medium-speed (30-40 mph), medium-capacity (10,000-35,000 average daily trips) roadway that provides intra-community travel and access to the county-wide highway system. Access to community arterials should be provided at collector roads and local streets, but direct access from parcels to existing arterials is common.

Bicycle Lane (Class II): A corridor expressly reserved for bicycles, existing on a street or roadway in addition to any lanes for use by motorized vehicles.

Bicycle Path (Class I): A paved route not on a street or roadway and expressly reserved for bicycles traversing an otherwise unpaved area. Bicycle paths may parallel roads but typically are separated from them by landscaping.

Bicycle Route (Class III): A facility shared with motorists and identified only by signs, a bicycle route has no pavement markings or lane stripes.

Buffer: An area of land separating two distinct land uses that acts to soften or mitigate the effects of one land use on the other.

Building: Any structure used or intended for supporting or sheltering any use or occupancy.

Building Type: a structure category determined by function, disposition on the lot, and configuration, including frontage and height. For example, a rowhouse is a type, not a style.

Buildout: Development of land to its full potential or theoretical capacity as permitted under current or proposed planning or zoning designations.

California Environmental Quality Act (CEQA): Law requiring State and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an Environmental Impact Report (EIR) must be prepared and certified before taking action on the proposed project.

Capital Improvements Program (CIP): A program that schedules permanent City improvements at least five years ahead to fit projected fiscal capability. The CIP is reviewed annually.

Channelization: The straightening and/or deepening of a watercourse for purposes of runoff control or ease of navigation; often includes lining banks with retaining material such as concrete.

Character: Special physical characteristics of a structure or area that set it apart from its surroundings and contribute to its individuality.

Charrette: An interactive, multi-day public process in which the community works together with planning and design professionals and City staff and officials to create and support a feasible plan for a specific area of the City that will produce positive and transformative community change.

City: When capitalized, refers to the governmental entity; "city" refers to the geographic area.

Civic: the term defining not-for-profit organizations dedicated to the arts, culture, education, recreation, government, transit, and municipal parking.

Clustered Development: Buildings placed close together with the purpose of retaining open space area.

Co-housing: A residential development with dwelling units for grouped around a common kitchen, gathering room, and child-care facilities. Co-housing developments normally are organized as condominiums.

Collector: Relatively-low-speed (25-30 mph), relatively low-volume (5,000-10,000 average daily trips) street that provides circulation within and between neighborhoods. Collectors usually serve short trips and are intended for collecting trips from local streets and distributing them to the arterial network.

Commerce; Commercial: The buying and selling of commodities and services.

Community Noise Equivalent Level (CNEL): A 24-hour energy equivalent level derived from a variety of single-noise events, with weighting factors of 5 and 10 dBA applied to the evening (7 PM to 10 PM) and nighttime (10 PM to 7 AM) periods, respectively, to allow for the greater sensitivity to noise during these hours.

Community Park: Land with full public access intended to provide recreation opportunities beyond those supplied by neighborhood parks. Community parks are larger in scale than neighborhood parks but smaller than regional parks.

Corridor: Linear features that may form boundaries, as well as connections, between neighborhoods. Corridors frequently encompass major access routes, especially ones with commercial destinations. Corridors also can incorporate parks or natural features such as streams or canyons.

dB: Decibel; a unit used to express the relative intensity of a sound as it is heard by the human ear.

dBA: The "A-weighted" scale for measuring sound in decibels; weighs or reduces the effects of low and high frequencies in order to simulate human hearing. Every increase of 10 dBA doubles the perceived loudness though the noise is actually ten times more intense.

Dedication: The turning over by an owner or developer of private land for public use, and the acceptance of land for such use by the governmental agency having jurisdiction over the public function for which it will be used. Dedications for roads, parks, school sites, or other public uses often are made conditions for approval of a development by a city or county.

Density, Residential: The number of permanent residential dwelling units per gross acres of land.

Density Bonus: The allocation of development rights that allow a parcel to accommodate additional square footage or additional residential units beyond the maximum for which the parcel is zoned, usually in exchange for the provision or preservation of an amenity at the same site or at another location. Under California law, a housing development that provides 20 percent of its units for lower income households, or 10 percent of its units for very low-income households, or 50 percent of its units for seniors, is entitled to a density bonus.

Design Review: The comprehensive evaluation of a development and its impact on neighboring properties and the community as a whole, from the standpoint of site and landscape design, architecture, materials, colors, lighting, and signs, in accordance with a set of adopted criteria and standards.

Detention Basin: A structure constructed to retard flood runoff and minimize the effect of sudden floods. Water is temporarily stored and released through an outlet structure at a rate that will not exceed the carrying capacity of the channel downstream. Basins often are planted with grass and used for open space or recreation in periods of dry weather.

Developer: An individual or business that prepares raw land for the construction of buildings or causes to be built physical space for use primarily by others, and in which the preparation of the land or the creation of the building space is in itself a business and is not incidental to another business or activity.

Development: The physical extension and/or construction of urban land uses, including: subdivision of land; construction or alteration of structures, roads, utilities, and other facilities; installation of septic systems; grading; deposit of refuse, debris, or fill materials; and clearing of natural vegetative cover (with the exception of agricultural activities). Routine repair and maintenance activities are exempted.

Development Fee: (See "Impact Fee.")

District: An area of the city that has a unique character identifiable as different from surrounding areas because of distinctive architecture, streets, geographic features, culture, landmarks, activities, and/or land uses. A neighborhood or parts of neighborhoods can form a district. Districts consist of streets or areas emphasizing specific types of activities. A corridor may also be a district, as when a major shopping avenue runs between adjoining neighborhoods.

Dwelling Unit: A room or group of rooms (including sleeping, eating, cooking, and sanitation facilities, but not more than one kitchen), which constitutes an independent housekeeping unit, occupied or intended for occupancy by one household on a long-term basis.

Encourage, *v*: To stimulate or foster a particular condition through direct or indirect action by the private sector or government agencies.

Enhance, *v*: To improve existing conditions by increasing the quantity or quality of beneficial uses or features.

Environment: The existing physical conditions in an area that will be affected by a proposed project, including land, air, water, mineral, flora, fauna, noise, and objects of historic or aesthetic significance.

Environmental Impact Report (EIR): A report required by CEQA that assesses all the environmental characteristics of an area and determines what effects or impacts will result if the area is altered or disturbed by a proposed action.

Fault: A fracture in the earth's crust forming a boundary between rock masses that have shifted.

Flood, 100-Year: The magnitude of a flood expected to occur on the average every 100 years, based on historical data. The 100-year flood has a one percent chance of occurring in any given year.

Floodplain: The relatively level land area on either side of the banks of a stream regularly subject to flooding. That part of the flood plain subject to a one percent chance of flooding in any given year is designated as an "area of special flood hazard" by the Federal Insurance Administration.

Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the "base flood" without cumulatively increasing the water surface elevation more than one foot. No development is allowed in floodways.

General Plan: A compendium of city or county policies regarding its long-term development, in the form of maps and accompanying text. The General Plan is a legal document required by the State of California Government Code Section 65301 and adopted by the City Council.

Gateway: A point along the edge of a city at which a person gains a sense of having left the environs and entered the city.

Goal: A general, overall, and ultimate purpose, aim, or end toward which the City will direct effort.

Green: A whole-building and systems approach to siting, design, construction, and operation that employs techniques that minimize environmental impacts and reduce the energy consumption of buildings while contributing to the health and productivity of occupants.

Hazardous Material: Any substance that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. The term includes, but is not limited to, hazardous substances and hazardous wastes.

Hillside Area: All that area north of Foothill and Poli Street, and east of Cedar Street and within City limits. This area is subject to the Hillside Management Program.

Hillside Open Space: One of the 19 distinct communities within the City's Planning Area; coterminous with the Hillside Voter Participation Area; generally referred to as "hillsides".

Hillside Voter Participation Area or HVPA: The area subject to the "Hillside Voter Participation Act" (also known as Measure "P") as set forth in Appendix X and coterminous with the "Hillside Open Space" area depicted on the Land Use Diagram.

Hillsides: Synonymous and coterminous with HVPA and "Hillside Open Space".

Historic: Noteworthy for significance in local, state, or national history or culture, architecture or design, or housing works of art, memorabilia, or artifacts.

Household: Persons who occupy a housing unit.

Housing Element: A separately published State-mandated general plan element that assesses existing and projected housing needs of all economic segments of the community, identifies potential sites adequate to provide the amount and kind of housing needed, and contains adopted goals, policies, and implementation programs for the preservation, improvement, and development of housing. The Housing Elements is updated every five years.

Housing Unit: A rooms or a rooms intended for occupancy, separate from any other living space, with direct access from outside or through a common area.

Impact: The direct or indirect effect of human action on existing physical, social, or economic conditions.

Impact or Development Fee: A fee levied on the developer of a project as compensation for otherwise-unmitigated impacts the project will produce, not to exceed the estimated reasonable cost of providing the service for which the fee is charged.

Industry/Industrial: The manufacture, production, and processing of consumer goods. Industrial is often divided into "heavy industrial" uses, such as construction yards, quarrying, and factories; and "light industrial" uses, such as research and development and less intensive warehousing and manufacturing.

Infill: Development of vacant and/or underutilized land within areas already largely developed with urban uses.

Infrastructure: Public services and facilities, such as sewage-disposal systems, water-supply systems, and other utilities.

In-lieu Fee: Payment that substitutes for required dedication of land or provision of structures or amenities.

Institutional: Uses such as hospitals, museums, schools, places of worship, and nonprofit activities of a welfare, educational, or philanthropic nature that cannot be considered residential, commercial, or industrial activities.

Landmark: (1) A building, site, object, structure, or significant tree, having historical, architectural, social, or cultural significance and marked for preservation by the local, state, or federal government. (2) A visually prominent or outstanding structure or natural feature that functions as a point of orientation or identification.

Ldn: Day-Night Average Sound Level. The A-weighted average sound level for a given area (measured in decibels) during a 24-hour period with a 10 dB weighting applied to night-time sound levels. The Ldn is approximately numerically equal to the CNEL for most environmental settings.

Leq: The energy equivalent level, defined as the average sound level on the basis of sound energy (or sound pressure squared). The Leq is a "dosage" type measure and is the basis for the descriptors used in current standards, such as the 24-hour CNEL used by the State of California.

Lease: A contractual agreement by which an owner of real property (the lessor) gives the right of possession to another (a lessee) for a specified period of time (term) and for a specified consideration (rent).

Level of Service, Intersection (LOS): A scale that measures the amount of traffic an intersection is capable of handling. Levels range from A, representing free-flow, to F corresponding to significant stoppage.

Liquefaction: The transformation of loose water-saturated granular materials (such as sand or silt) from a solid into a liquid state, which can lead to ground failure during an earthquake.

Live-Work: A dwelling unit that contains, to a limited extent, a commercial component. A live-work unit is a fee-simple unit on its own lot with the commercial component limited to the ground level. (see Work-Live)

Local Agency Formation Commission (LAFCo): A commission in each county that reviews and evaluates proposals for formation of special districts, incorporation of cities, annexation to special districts or cities, consolidation of districts, and merger of districts with cities. LAFCo members include two county supervisors, two city council members, and one member representing the general public.

Local Coastal Program (LCP): A combination of City land use plans, zoning regulations, and zoning district maps that control land use in the Coastal Zone established under the California Coastal Act of 1976.

Local Street: Relatively low-volume, low-speed streets (not shown on the Roadway Classifications map), whose primary purpose is to provide access to fronting properties.

Lot: A legally-recognized parcel with frontage on a public or City-approved private street.

Low Income: Households with annual income 80 percent of the County median or less.

Maintain: Keep in an existing state. (See “Preserve.”)

Median: The dividing area between opposing lanes of traffic.

Mitigate: Alleviate or avoid to the extent feasible.

Mixed Use: Properties on which various uses, such as office, commercial, and institutional, are combined with residences in a single building or site in an integrated development project with significant functional interrelationships and a coherent physical design. A single site may include contiguous properties.

Neighborhood: The basic building blocks of a community that together comprise the city. Each neighborhood is limited in physical area, with a defined edge and a center. The size of a neighborhood is usually based on the distance that a person can walk in five minutes from the center to the edge – a quarter-mile. Neighborhoods have a fine-grained mix of land uses, providing places to live, work, shop, and be entertained.

Neighborhood Center: The focal point of a neighborhood, commonly featuring places for work, shopping, services, entertainment, leisure, recreation, and social and civic interaction.

Neighborhood Park: A facility intended to serve the recreation needs of people living or working within a one-half mile radius of the park.

Noise: Sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying.

Noise Contour: A line connecting points of equal noise level as measured on the same scale. Noise levels greater than the 60 Ldn contour (measured in dBA) require mitigation in residential development.

Office: Professional or consulting services in fields such as accounting, architecture, design, engineering, finance, law, insurance, medicine, real estate, and similar types of work.

Open Space: An area of land or water that is essentially unimproved and devoted to outdoor recreation and/or the preservation of natural resources.

Outdoor Recreation: Recreation in an urbanized outdoor setting (active recreation) or open-space outdoor setting (passive recreation).

(a) *Active outdoor recreation* includes participant sports or other activities conducted in open or partially enclosed or screened recreational activities facilities. Typical uses include driving ranges, miniature golf courses, golf courses, amusement parks, swimming pools, and tennis courts and usually rely on permanent above-ground improvements, including, but not limited to, playing fields or courts, restrooms, and tables.

(b) *Passive outdoor recreation* includes recreational activities, usually of an individual or small group nature, such as sunbathing, walking, hiking, bird watching, or nature study, conducted in an open-space setting and which, generally, do not rely on the use of permanent aboveground improvements or involve motorized vehicle use.

Parcel: A lot, or contiguous group of lots, in single ownership or under single control, usually considered a unit for purposes of development.

Parks: Open space lands whose primary purpose is recreation.

Parkway: The area between curb and sidewalk, usually planted with ground cover and/or trees.

Pedestrian Shed: an area defined by the average distance that may be traversed at and easy walking pace from its edge to its center. This distance is applied to determine the size of a neighborhood or extent of a community. A standard Pedestrian Shed is one quarter of a mile radius or 1,320 feet. With transit available or proposed, a long Pedestrian Shed has an average walking distance of ½-mile or 2,640 feet. Pedestrian Sheds should be conceived as oriented toward a central destination containing one or more important intersections, meeting places, civic spaces, civic buildings, and the capacity to accommodate a T5 Transect Zone in the future. Sometimes called a Walkshed.

Planning Area: The land area addressed by the General Plan, which includes the City Limits, potentially annexable land in the Sphere of Influence, and neighboring open space and agricultural areas of Ventura County that the City desires to remain in rural condition.

Policy: A statement of principle that anticipates specific actions to be undertaken to meet City goals.

Pollution: The presence of matter or energy whose nature, location, or quantity produces undesired environmental effects.

Preserve: Keep intact and safe from destruction or decay.

Protect: Maintain and preserve beneficial uses in their present condition.

Public and Quasi-public Facilities: Institutional, academic, governmental and community service uses, either publicly owned or operated by non-profit organizations.

Public Art: Signs, other monuments, sculptures, murals, statues, fountains, and other artistic installations in spaces accessible to the general public that accentuate or draw attention to a particular place or feature of the city, provide a focal point for public gathering, and/or serve a specific function, such as to provide seating.

Recreation, Active: A type of recreation that requires organized play areas, such as softball, baseball, football and soccer fields, tennis and basketball courts and various forms of children's play equipment.

Recreation, Passive: Recreation that does not require organized play areas.

Recycling: The process of extracting and reusing materials from waste products.

Redevelop: To demolish existing buildings, or increase the overall floor area existing on a property, or both, irrespective of whether a change occurs in land use.

Redevelopment Agency: The City division created under California Redevelopment Law for the purpose of planning, developing, re-planning, redesigning, clearing, reconstructing, and/or rehabilitating all or part of a specified area with residential, commercial, industrial, and/or public (including recreational) structures and facilities.

Regional: Pertaining to activities or economies at a scale greater than that of a single jurisdiction and affecting a broad geographic area.

Regional Park: A park typically 150-500 acres in size focusing on activities and natural features not included in most other types of parks and often based on a specific scenic or recreational opportunity.

Restore: Renew, rebuild, or reconstruct to a former state.

Ridesharing: Vehicle travel other than driving alone.

Ridgeline: A line connecting the highest points along a ridge and separating drainage basins or small-scale drainage systems from one another.

Right-of-way: Land intended to be occupied by transportation and public use facilities such as roadways, railroads, and utility lines.

Riparian: Areas adjacent to perennial and intermittent streams delineated by the existence of plant species normally found near fresh water.

Runoff: The portion of precipitation that does not percolate into the ground.

Seismic: Caused by or subject to earthquakes or earth vibrations.

Sidewalk: the paved layer of the public frontage dedicated exclusively to pedestrian activity.

Specific Plan: A legal tool allowed by State Government Code Section 65450 et seq. that prescribes detailed regulations, conditions, programs, and/or proposed legislation for a defined area of the city.

Sphere of Influence: The probable ultimate physical boundaries and service area of the city, as determined by LAFCo.

Streetscape: the urban element that establishes the major part of the public realm. The streetscape is composed of thoroughfares (travel lanes for vehicles and bicycles, parking lanes for cars, and sidewalks or paths for pedestrians) as well as the visible private frontages (building facades and elevations, porches, yards, fences, awnings, etc.), and the amenities of the public frontages (street trees and plantings, benches, and streetlights, etc.).

Structure: Anything constructed or erected that requires location on the ground (excluding swimming pools, fences, and walls used as fences).

Subdivision: The division of a land into defined lots or condominiums that can be separately conveyed by sale or lease.

Sustainable: Meeting the needs of the present without compromising the ability of future generations to meet their needs, and successfully balancing economic, environmental, and social equity concerns.

Tourism: The business of providing services for persons traveling for pleasure.

Transect: a system of ordering human habitats in a range from the most natural to the most urban. Based upon six Transect Zones that describe the physical character of place at any scale, according to the density and intensity of land use and urbanism.

Transit-Oriented Development (TOD): Relatively high-density development located within an easy walk of a major transit stop, generally with a mix of residential, employment, and shopping designed primarily for pedestrians.

Transit, Public: A system of regularly-scheduled buses and/or trains available to the public on a fee-per-ride basis.

Transportation Demand Management (TDM): Strategies for reducing the number of vehicle trips by increasing ridesharing, transit use, walking, and biking.

Trip: A one-way journey that proceeds from an origin to a destination via a single mode of transportation.

Truck Route: A route required for all vehicles exceeding set weight or axle limits, which follows major arterials through commercial or industrial areas and avoids sensitive areas.

Underutilized: Non-vacant properties that have not been fully developed with improvements that reach the allowed density and/or floor area.

Urban Design: The attempt to give form, in terms of both beauty and function, to selected urban areas or to whole cities. Urban design is concerned with the location, mass, and design of various urban components and combines elements of urban planning, architecture, and landscape architecture.

Use Permit: The discretionary and conditional review of an activity or function or operation on a site or in a building or facility.

Very Low Income: Households with annual income 50 percent of the County median or less.

View Corridor: The line of sight of an observer looking toward an object of significance (e.g., ridgeline, river, historic building, etc.).

Viewshed: The area within view from a defined point.

Watercourse: Presently or once naturally perennially or intermittently flowing water, including rivers, streams, barrancas, and creeks. Includes waterways that have been channelized, but not ditches or underground drainage and sewage systems.

Watershed: The total area above a given point on a watercourse that contributes water to its flow; also, the entire region drained by a watercourse.

Wetlands: Transitional areas between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water. Federal agencies establish hydrology, vegetation, and soil criteria to define wetlands.

Work-Live: A dwelling unit that contains a commercial component. A Work-Live unit is a fee-simple unit on a lot with the commercial component anywhere within the unit. (see Live-Work)

Yield Street: A street whereby by two vehicles, going in opposite directions, one car will often have to pull over slightly and yield to the other vehicle, depending on how many cars are parked on the street. A standard residential street.

Zoning: The regulation of building forms and land uses throughout the city.

County View

Ventura County, California

Home

I want to...

Tools

Find a parcel:

By APN

By Address

Find a location:

Locate Intersection

Locate Address

Zoom to a location, then click on the map for parcel information

More Tasks:

Print map

More Tools

User Guide

County GIS

Browser compatibility and other FAQs

(gishelp@ventura.org)

Disclaimer

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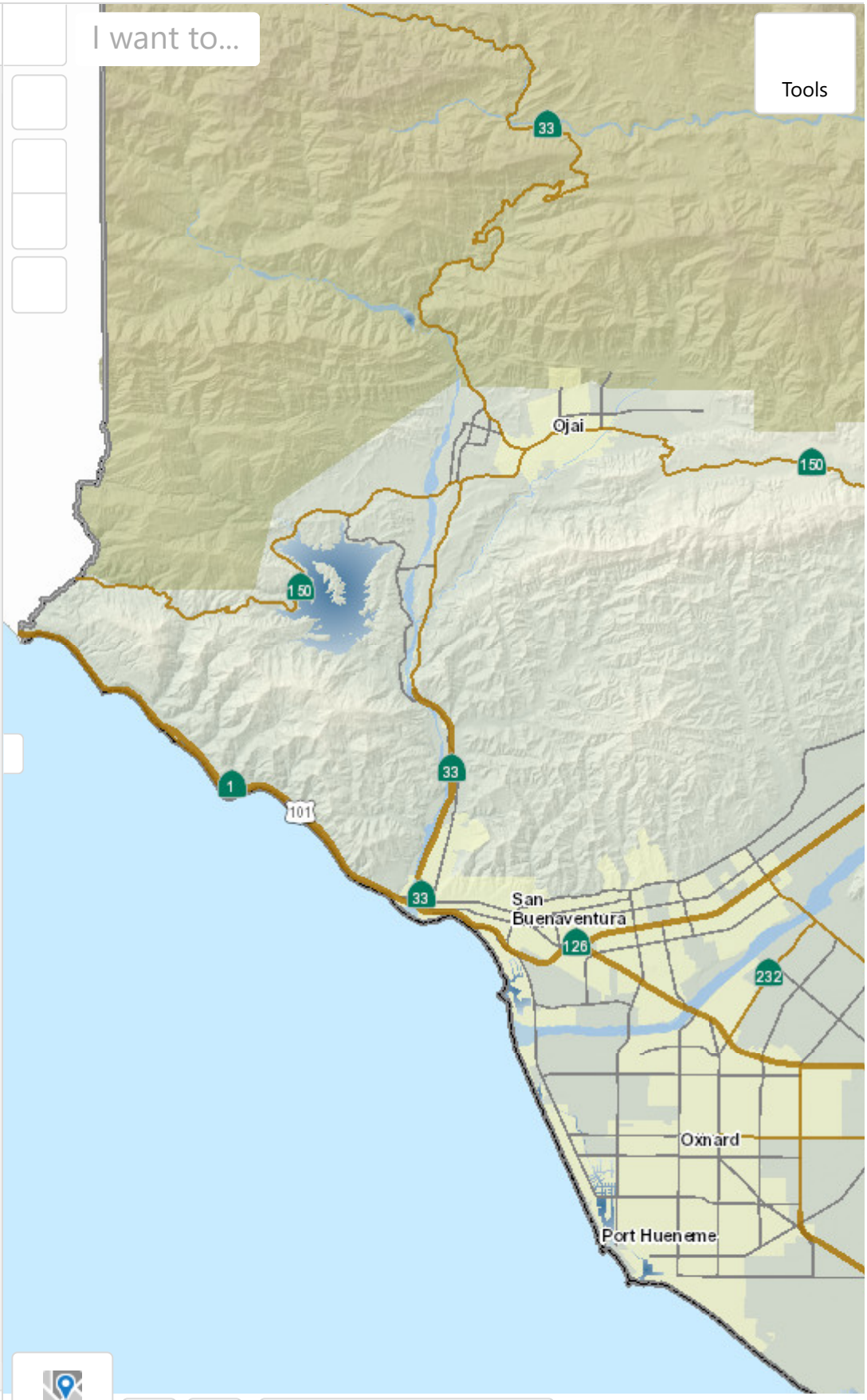
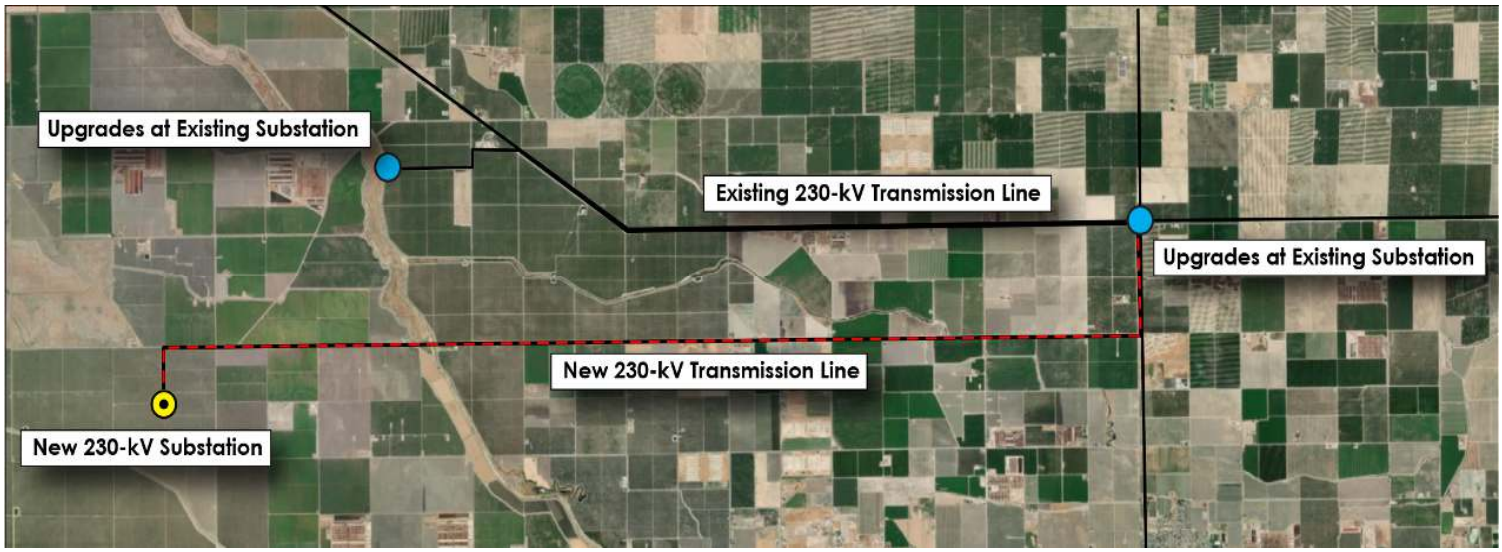


Home

Layers

Basemaps



Guidelines for Energy Project Applications Requiring CEQA Compliance:

Pre-filing and Proponent's Environmental Assessments

November 2019

Version 1.0

Energy Division

Infrastructure Permitting and CEQA Unit

California Public Utilities Commission

Guidelines for Energy Project Applications Requiring CEQA Compliance:

Pre-filing and Proponent's Environmental Assessments

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Foreword

November 12, 2019

To: Applicants Filing Proponent's Environmental Assessments for Energy Infrastructure Projects at the California Public Utilities Commission (CPUC or Commission)

From: Merideth Sterkel (Program Manager, Infrastructure Planning and Permitting) and Mary Jo Borak and Lonn Maier, Supervisors, Infrastructure Permitting and California Environmental Quality Act, Energy Division, CPUC

Subject: Introducing revisions to the Pre-filing Guidelines for Energy Infrastructure Projects and a Unified and Updated Electric and Gas PEA Checklist

We are pleased to release a 2019 revision to the California Environmental Quality Act (CEQA) Proponent's Environmental Assessments (PEA) Checklist. This substantially revised document is now entitled "Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments" (Guidelines). Future updates to this document will be made as determined necessary. The CPUC's Rules of Practice and Procedure Sections 2.4 provide that all applications to the CPUC for authority to undertake projects that are not statutorily or categorically exempt from CEQA requirements shall include an Applicant-prepared PEA.

Updates Overview

Prior versions of the Working Draft PEA Checklist were published in 2008 and 2012. For this 2019 update, extensive revisions were made to all sections based on our experience with the prior checklist versions. All electric and natural gas projects are now addressed in a single PEA Checklist, and the following updates were made:

- **CEQA Statute and Guidelines 2019 Updates:** The PEA Checklist is updated pursuant to the 2019 CEQA Statues and Guidelines, including new energy and wildfire resource areas.
- **Pre-filing Consultation Guidelines:** Pre-filing guidelines are now provided since the pre-filing and PEA development processes are intertwined.
- **Unified PEA Checklist for Energy Projects:** All electric and natural gas projects are now addressed in a single PEA Checklist.
- **Additional CEQA Impact Questions:** Questions are included for the following PEA Checklist sections: 5.4, Biological Resources; 5.6, Energy; 5.9, Hazards, Hazardous Materials, and Public Safety; 5.16, Recreation; 5.17, Transportation; and 5.19, Utilities and Service Systems.
- **CPUC Draft Environmental Measures:** Draft measures are provided in PEA Checklist Attachment 4 for Aesthetics, Air Quality, Cultural Resources, Greenhouse Gas Emissions, Utilities and Service Systems and Wildfire.

Purpose of the Guidelines Document

The purpose and objective of the PEA Checklist included within this Guidelines document has not changed, which is to provide project Proponents (Applicants) with detailed guidance about information our CEQA Unit Staff expect in sufficient PEAs. The document details the information Applicants must provide the CPUC to complete environmental reviews that satisfy CEQA requirements. Specifically, the Pre-filing Consultation Guidelines and PEA Checklist, together, are intended to achieve the following objectives:

1. Provide useful guidance to Applicants, CPUC staff, and outside consultants regarding the type and detail of information needed to quickly and efficiently deem an application complete;

2. Ensure PEAs provide reviewers with a detailed project description and associated information sufficient to deem an application complete, avoid lengthy review periods and numerous data requests for the purpose of augmenting a PEA, and avoid unnecessary PEA production costs;
3. Increase the level of consistency between PEAs submitted and provide for more consistent review by CPUC CEQA Unit Staff and outside consultants; and
4. Promote transparency and reduce the potential for conflicts between utility and CPUC Staff about the types, scope, and thoroughness of data expected for data adequacy purposes.

The Guidelines document provides detailed instructions to Applicants for use during the Pre-filing process and PEA development. The document is intended to fully inform Applicants and focus the role of outside consultants, thus, enabling Applicants to submit more complete, useful, and immediately data-adequate PEAs.

Benefits of High Quality and Complete PEAs

CPUC CEQA Unit Staff seek to complete the environmental review process required under CEQA as quickly and efficiently as possible. Table 1 shows the average duration in months of CPUC applications that require CEQA documents. While there are tensions between speed and quality in all project management, the achievement of expeditious environmental reviews can result in lower project costs to ratepayers. Our staff have reviewed the timelines for 108 past CPUC applications that required review pursuant to CEQA and determined that the average length of time from application filing to PEA deemed complete is four months, regardless of the type of CEQA document. The goal for our agency is to deem PEAs complete within 30 days. The faster PEAs are deemed complete, the sooner staff can prepare the CEQA document. With each delay to PEA completeness, the fundamental project purpose and need and baseline circumstances may shift, requiring refreshing of the data. The Guidelines document will improve the initial accuracy of PEAs and reduce the time required to deem PEAs complete. Once an application is formally filed, the Applicant will receive a notification letter from CPUC CEQA Unit Staff when the PEA is deemed complete.

Table 1. Average Duration in Months of CPUC Applications that Require CEQA Documents (1996–2019)

	I: Application Filed to PEA Deemed Complete	II: PEA Deemed Complete to Draft Environmental Document Circulated	III: Draft Environmental Document to Final Released	IV: Final Released to Proposed Decision	V: Proposed Decision to Final Decision (with Certification of CEQA Document)	I-V: Overall Duration (1)
Environmental Impact Report (EIR; n=49)	5	13	7	5	2	**29**
Initial Study/ Mitigated Negative Declaration (IS/MND; n=56)	4	8	3	4	1	**19**
All Document Types (n=108)	4	8	4	5	2	**23**
Range: All Document Types	*1-9*	*5-18*	*2-10*	*1-7*	*1-2*	***12-38***

Note:
(1) The overall duration is not a sum of the average durations for each step. The overall duration was calculated using "n," the number of applications with data available for the date of application filing and final decision date. Not all projects had data available for each step. The data include several instances where the CEQA document was developed in conjunction with a NEPA document, e.g., an EIR/Environmental Impact Statement or IS/MND/Environmental Assessment/Finding of No Significant Impact was prepared instead of an EIR or MND, respectively. The above data is not inclusive of projects that had averages and ranges that are statistically abnormal.

Lessons Learned about the PEA Process

In the past, Applicants have filed PEAs using the checklist to ensure the correct information was provided but have not followed the format and organization of the PEA checklist and sometimes chose not to engage in Pre-filing activities with our staff. To achieve the objectives and benefits listed above, Applicants will file all future PEAs in the same organizational format as the updated checklist and adhere to the Pre-filing Consultation Guidelines in coordination with CPUC CEQA Unit Staff.

The Guidelines document describes the level effort required for the assessments necessary to not only finalize a CEQA document but ensure its legal defensibility. While final design and survey information is preferred, the PEA may incorporate preliminary design and survey data as appropriate and in consultation with CEQA Unit Staff during Pre-filing. We recognize that projects are fact specific, and deviations from the Pre-filing Consultation Guidelines and PEA Checklist are inevitable but providing concise and accurate information as soon as possible is paramount. Any deviations from these Guidelines must include clear justification and should be discussed and submitted during the Pre-filing Consultation process to avoid subsequent delays.

The PEA Checklist is written with the assumption that an Environmental Impact Report will be prepared, however, a Mitigated Negative Declaration or other form of CEQA document (e.g., exemption) may be appropriate. This determination, however, must be made in consultation with CPUC CEQA Unit Staff during Pre-filing and prior to submittal of the Draft PEA.

Future Modifications and Improvements

Like the predecessor PEA checklists, this is a working document that will be modified over time based on experience and changes to the CEQA Statute and Guidelines. To meet the above stated objectives and maintain consistency with CEQA. We expect Applicants, their consultants, CPUC consultants, and the CPUC to engage in a regular and ongoing dialogue about specific improvements to the CEQA process overall, and these Guidelines in particular.

We look forward to working with Applicants during the Pre-filing Consultation process to ensure that the level of effort that goes into preparing PEAs can be effectively and efficiently transferred into the CEQA document prepared by CPUC Staff and consultants. Applicants are invited to debrief with our staff about the efficacy of these Guidelines.

Merideth Sterkel
/s/
Program Manager, Infrastructure Planning and Permitting
California Public Utilities Commission

Mary Jo Borak
/s/
Supervisor, Infrastructure Permitting and CEQA Unit
California Public Utilities Commission

Lonn Maier
/s/
Supervisor, Infrastructure Permitting and CEQA Unit
California Public Utilities Commission

Pre-Filing Consultation Guidelines

The following Pre-filing Consultation Guidelines apply to all PEAs filed with applications to the CPUC and outline a process for Applicants to engage with CPUC CEQA Unit Staff about upcoming projects that will require environmental review pursuant to CEQA. The CPUC is typically the Lead Agency for large projects by investor-owned gas and electric utilities. The CPUC's CEQA Unit Staff are experienced with developing robust CEQA documents for long, linear energy projects. The PEA Checklist, starting in the next section, is based upon that experience.

Pre-filing Consultation Process

During Pre-filing Consultation, Applicants and CPUC Staff meet to discuss the upcoming application. Successful projects will commence Pre-filing Consultation no less than six months prior to application filing at the CPUC. When the application is formally filed at the CPUC, the Application and the PEA are submitted to the CPUC Docket Office.

1. Meetings with CPUC Staff

To initiate Pre-filing Consultation, Applicants will request and attend a meeting with CPUC CEQA Unit Staff at least six months prior to application filing.

   a. Applicants can request a Pre-Filing Consultation meeting via email or letter. Initial contact via telephone may occur, but staff request written documentation of Pre-filing Consultation commencement.

   b. For the initial meeting, Applicants will provide staff with a summary of the proposed project including maps and basic GIS data at least one week prior to the meeting.

   c. Applicants will receive initial feedback on the scope of the proposed project and PEA. Staff will work with Applicants to establish a schedule for subsequent Pre-filing meetings and milestones.

2. Consultant Resources

CPUC CEQA Unit Staff will initiate the consultant contract immediately following the initial Pre-filing Consultation meeting. CPUC's consultant contract resources will be executed prior to Applicant filing of the Draft PEA. The consultant contract is critical to the Pre-filing Consultation process. Applicants are encouraged to request updates about the status of the contract. The CPUC may use its on-call consulting resources contract for these purposes. If CEQA Unit Staff determine that their on-call consulting resources are not appropriate due to the anticipated project scope, staff may initiate a request for proposals process to engage consulting resources, and the resulting contracting process will be completed and consultant contract in place prior to Draft PEA filing.

3. Draft PEA Provided Prior to PEA Filing

A complete Draft PEA will be filed at least three months prior to application filing. CPUC CEQA Unit Staff and the CPUC consultant team will review and provide comments on the Draft PEA to the Applicant early in the three-month period to allow time for Applicant revisions to the PEA.

4. Project Site Visits

One or more site visits will be scheduled with CPUC CEQA Unit Staff and their consultant at the time of Draft PEA filing (or prior). Appropriate federal, state, and local agencies will also be engaged at this time.

5. Consultation with Public Agencies

The Applicant and CPUC CEQA Unit Staff will jointly reach out and conduct consultation meetings with public agencies and other interested parties in the project area. CPUC CEQA Unit Staff may also choose to conduct separate consultation meetings if needed.

If a federal agency will be a co-lead pursuant to the National Environmental Policy Act and coordinating with the CPUC during the environmental review process, the Applicant and CPUC CEQA Unit Staff will ensure that the agency has the opportunity to comment on the Draft PEA and participate jointly with the CPUC throughout the application review process. Applicant and Commission CEQA Unit Staff coordination with the federal agency (if applicable) will likely need to occur more than six months in advance of application filing.

6. Alternatives Development

PEAs will be drafted with the assumption that an Environmental Impact Report (EIR) will be prepared. Applicants will include a reasonable range of alternatives in the PEA (even though a Mitigated Negative Declaration [MND] may ultimately be prepared), including sufficient information about each alternative. In some situations, CPUC CEQA Unit Staff and project Applicants may agree during Pre-filing Consultation that an MND is likely and a reasonable range of alternatives is not required for the PEA. This determination, however, must be made in consultation with CEQA Unit Staff during Pre-filing and is not final. The type of document to be prepared may change based on public scoping results and other findings during the environmental review process.

CEQA Unit Staff will provide feedback on the range of alternatives prior to Draft PEA filing (if possible) based on their review of the Draft PEA. It is critical that Applicants receive feedback from CEQA Unit Staff about the range of alternatives prior to filing the PEA. Applicants will ensure that each alternative is described and evaluated in the PEA with an equal level of detail as the proposed project unless otherwise instructed in writing by CEQA Unit Staff.

7. Format of PEA Submittal

Each PEA submittal will include the completed PEA Checklist tables. Each PEA submittal will be formatted and organized as shown in the Example PEA Table of Contents provided in the PEA Checklist unless otherwise directed by CPUC CEQA Unit Staff in writing prior to application filing. The example PEA Table of Contents is modeled after typical CPUC EIRs.

8. Transmission and Distribution System Information

A key component of CEQA projects analyzed during CPUC environmental reviews is the context of the project within the larger transmission and distribution system. Detailed descriptions of the regional transmission system, including GIS data, to which the proposed project would interconnect are required. The required level of detail about interconnecting systems is project specific and will be specified by CEQA Unit Staff in writing during Pre-filing Consultation. Detailed distribution system information may also be required.

9. Data and Technical Adequacy

Applicants will focus PEA development efforts on providing thorough, up-to-date data and technical reports required for CPUC CEQA Unit Staff to complete the environmental document and alternatives analysis.

The Applicant-drafted PEA Executive Summary, Introduction, Project Description, Description of Alternatives, and other chapters typically found in past CPUC EIRs and Initial Study/MNDs will be *thorough*—emulate the level of detail provided in typical CPUC EIRs. The setting sections provided for

PEA Chapter 5, Environmental Analysis, will also be thorough. Applicants will ensure that the PEA text, graphics, and file formats can be efficiently converted into CPUC's CEQA document with minimal revision, reformatting, and redevelopment by CPUC Staff and consultants.

The impact analyses and determinations provided for Chapter 5, Environmental Analysis, and Chapter 6, Comparison of Alternatives, need not be as thorough as those to be prepared by the CPUC for its CEQA document. These two sections are expected to be revised and redeveloped by CPUC Staff and consultants. Other sections of the CEQA document will only be revised and redeveloped by CPUC Staff and consultants if determined to be necessary after PEA filing.

10. Applicant Proposed Measures

The Pre-filing Consultation process can support the development Applicant Proposed Measures (APMs); measures that Applicants incorporate into the PEA project description to avoid or reduce what otherwise may be considered significant impacts. APMs that use phrases, such as, "as practicable," "as needed," or other conditional language will be superseded by Mitigation Measures if required to avoid or reduce a potentially significant impact. CPUC CEQA Unit Staff and their consultant team may review and provide comments on the Draft PEA APMs during Pre-filing Consultation.

Applicants will carefully consider each CPUC Draft Environmental Measure identified in Chapter 5 of this PEA Checklist. The measures may be applied to the proposed project if appropriate and may be subject to modification by the CPUC during its environmental review.[1]

11. PEA Checklist Deviations

CPUC CEQA Unit Staff understand that the PEA Checklist requires Applicants to develop a significant quantity of information. There are times when it is appropriate to deviate from the PEA Checklist. Deviations to the Pre-Filing Consultation Guidelines or the PEA Checklist contents may be approved by the CPUC's CEQA Unit Staff. Staff approval will be in writing and will occur prior to Applicant filing of the Draft PEA. Note that any deviations approved in writing by staff during the Pre-filing period may be reversed or modified after application and PEA filing and at any time throughout the environmental review period at the discretion of CPUC CEQA Unit Staff.

12. Submittal of Confidential Information

CPUC Staff are available during Pre-filing Consultation to discuss concerns that Applicants may have about confidentiality. However, the CEQA process requires public disclosure about projects, and such disclosure can often appear to conflict with Applicant requests for confidentiality. CPUC CEQA Unit Staff will rely on CPUC adopted confidentiality procedures to resolve confidentiality concerns. Applicants that expect aspects of a PEA filing to be confidential must follow CPUC confidentiality procedures. Applicants may mark information as confidential if allowed pursuant to General Order 66 or latest applicable Commission rule (e.g., see Public Records Act Proceeding Rulemaking (R.14-11-001).

13. Additional CEQA Impact Questions

Additional CEQA Impact Questions that are specific to the types of projects evaluated by the Commission's CEQA Unit are identified in the PEA Checklist to be considered in addition to the checklist items in CEQA Guidelines Appendix G.

The next section of this Guidelines document provides the PEA Checklist for all energy project applications that require CEQA compliance.

[1] At this time, the CPUC environmental measures are in draft format, see PEA Checklist Attachment 4. They may be formally incorporated into Chapter 5 of future versions of the PEA Checklist.

Proponent's Environmental Assessment (PEA) Checklist

The PEA Checklist provides project Applicants (e.g., projects involving electric transmission lines, electric substations or switching stations, natural gas transmission pipelines, and underground natural gas storage facilities) with detailed guidance regarding the level of detail CPUC CEQA Unit Staff expect to deem PEAs complete. Applicants will prepare their PEAs using the same section headers and numbering as provided in the PEA Checklist. Applicants will also provide supporting data that is specific to each item within the PEA Checklist. As noted in the Pre-Filing Consultation Guidelines, the PEA Checklist is written with the assumption that an EIR will be prepared. PEA contents may not need to support the development of an EIR, but this determination can only be made in consultation with CPUC CEQA Unit Staff as described in the Pre-Filing Consultation Guidelines.

Formatting and Basic PEA Data Needs, Including GIS Data

1. Provide **editable and fully functional source files** in electronic format for all PDF files, hardcopies, maps, images, and diagrams. Files will be provided in their original file format as well as the output file format. All Excel and other spreadsheet files or modeling files will include all underlying formulas/modeling details. All modeling files must be fully functional.
2. Details about the types of **GIS data and maps** to be submitted are provided in Attachment 1. GIS data not specified in this checklist may also be requested depending on the Proposed Project and alternatives.
3. The Applicant is responsible for ensuring that all project features, including project components and temporary and permanent work areas, are included within all **survey boundaries** (e.g., biological and cultural resources).
4. Excel spreadsheets with **emissions calculations** will be provided that are complete with all project assumptions, values, and formulas used to prepare emissions calculations in the PEA. Accompanying PDF files with the same information will be provided as Appendix B to the PEA (see List of Appendices below).
5. Applicants will provide in an Excel spreadsheet a comprehensive **mailing list** that includes the names and addresses of all affected landowners and residents, including unit numbers for multi-unit properties for both the proposed project and alternatives.
    a. An affected resident or landowner is defined as one whose place of residence or property is:
        i. Crossed by or abuts any component of the proposed project or an alternative including any permanent or temporary disturbance area (either above or below ground) and any extra work area (e.g., staging or parking area); or
        ii. Located within approximately 1,000 feet[2] of the edge of any construction work area.
    b. Include in the following information for each resident in a spreadsheet, at minimum: parcel APN number, owner name and mailing address, and parcel physical address. If individual occupant names, facility names, or business names are available, also provide these names and addresses in the spreadsheet. A sample mailing list format is provided in Table 2.

[2] Notice to all property owners within 300 feet of a Proposed Project is required at the time of application filing under GO 131-D. Commission notices of CEQA document preparation may be mailed to residents and property owners greater than 300 feet from a Proposed Project to ensure adequate notification (e.g., 1,000 feet) and the extent of notification will be determined on a project specific basis. Appropriate notice expectations will be discussed during Pre-filing (e.g., with respect to visual impact areas and other types of impacts specific to the Proposed Project and its study area).

Table 2. Sample Project Mailing List

Category	Company/ Agency	Name	Mailing Address	Phone Number	Email	APN	Source
State Agency	California Resources Agency	John Doe	1234 California Street City, CA 98765	(333) 456-7899	johndoe@email.com	123-456-789	County Assessor
Individual	n/a	Jane Doe	222 Main Street City, CA 97531	(909) 876-5432	janedoe@email.com	101-202-303	Public meeting on Month, Day 2019

6. **PEA Organization:** This PEA Checklist is organized to include each of the chapters and sections found in typical CPUC EIRs. The following sections will serve as the outline for all Draft PEAs submitted during Pre-filing and all PEAs filed with the CPUC Docket Office. PEAs will include each chapter and section identified (in matching numerical order) unless otherwise directed by CPUC CEQA Unit Staff in writing prior to filing.

Cover

A single sheet with the following information:	Applicant Notes, Comments
Title "Proponent's Environmental Assessment" and filing date	
Proponent Name (the Applicant)	
Name of the proposed project[3]	
Technical subheading summarizing the type of project and its major components, in one sentence or about 40 words, for example: A new 1,120 MVA, 500/115kV substation, 10 miles of new singled-circuit 500kV transmission lines, 25 miles of new and replaced double-circuit 115kV power lines, and upgrades at three existing substations are proposed.	
Location of the proposed project (all counties and municipalities or map figure for the cover that shows the areas crossed)	
Proceeding for which the PEA was prepared and CPUC Docket number (if known) or simply leave a blank where the Docket number would go	
Primary Contact's name, address, telephone number, and email address for both the project Applicant(s) and entities that prepared the PEA	
See example PEA cover in Figure 1.	

[3] If approved by the California Independent System Operator (CAISO), the project name listed will match the name specified in the CAISO approval. If multiple names apply, list all versions.

Figure 1. Example PEA Cover

Proponent's Environmental Assessment for California Utility Company's Evergreen Electric Substation and Transmission Line Project

May 1, 2019 (PEA filing date)

A new 230 kV substation, 10 miles of new single-circuit 230kV transmission lines, and upgrades at two existing substations are proposed.

The Proposed Project would be located primarily in __ County but would also cross __ and __ counties and areas within the City of __.

Application A.19-05-01 to the California Public Utilities Commission

Prepared by California Environmental Consulting
1234 Avenue
City, CA Zip Code
Primary Contact's Name
Position
Phone Number
Email

Prepared for California Utility Company
1234 Avenue
City, CA Zip Code
Primary Contact's Name
Position
Phone Number
Email

Table of Contents

Sections

Order	The format of the PEA will be organized as follows:	Applicant Notes, Comments
--	Cover	
--	Table of Contents, List of Tables, List of Figures, List of Appendices	
1	Executive Summary	
2	Introduction	
3	Proposed Project Description	
4	Description of Alternatives	
5	Environmental Analysis	
5.1	Aesthetics	
5.2	Agriculture and Forestry	
5.3	Air Quality	
5.4	Biological Resources	
5.5	Cultural Resources	
5.6	Energy	
5.7	Geology, Soils, and Paleontological Resources	
5.8	Greenhouse Gas Emissions	
5.9	Hazards, Hazardous Materials, and Public Safety	
5.10	Hydrology and Water Quality	
5.11	Land Use and Planning	
5.12	Mineral Resources	
5.13	Noise	
5.14	Population and Housing	
5.15	Public Services	
5.16	Recreation	
5.17	Transportation	
5.18	Tribal Cultural Resources	
5.19	Utilities and Service Systems	
5.20	Wildfire	
5.21	Mandatory Findings of Significance	
6	Comparison of Alternatives	

7	Cumulative Impacts and Other CEQA Considerations	
8	List of Preparers	
9	References[4]	
--	Appendices	

Required PEA Appendices and Supporting Materials

Order	Title	Applicant Notes, Comments
Appendix A	Detailed Maps and Design Drawings	
Appendix B	Emissions Calculations	
Appendix C	Biological Resources Technical Reports (see Attachment 2)	
Appendix D	Cultural Resources Studies (see Attachment 3)	
Appendix E	Detailed Tribal Consultation Report[5]	
Appendix F	Environmental Data Resources Report, Phase I Environmental Site Assessment, or similar hazardous materials report	
Appendix G	Agency Consultation and Public Outreach Report and Records of Correspondence	
Appendix H	Construction Fire Prevention Plan[6]	

Potentially Required[7] Appendices and Supporting Materials

Order	Title	Applicant Notes, Comments
Appendix I	Noise Technical Studies	
Appendix J	Traffic Studies	
Appendix K	Geotechnical Investigations (may preliminary at time of PEA filing)	
Appendix L	Hazardous Substance Control and Emergency Response Plan / Hazardous Waste and Spill Prevention Plan	

4 References will be organized by section but contained in a single chapter called, "References."

5 Include summary and timing of all correspondence to and from any Tribes and the State Historic Preservation Office/Native American Heritage Commission, including Sacred Lands File search results, and full description of any issues identified by Tribes in their interactions with the Applicant.

6 The Construction Fire Prevention Plan will be provided to federal, state, and local fire agencies for review and comment as applicable to where components of the proposed project would be located. CPUC will approve the final Construction Fire Prevention Plan. Record of the request for review and comment and any comments received from these agencies will be provided to CPUC CEQA Unit Staff.

7 Anticipated Appendix and study requirements should be discussed with CPUC CEQA Unit Staff during Pre-filing.

Appendix M	Erosion and Sedimentation Control Best Management Practice Plan / Draft Storm Water Pollution Prevention Plan (may be preliminary at time of PEA filing)	
Appendix N	FAA Notice and Criteria Tool Results	
Appendix O	Revegetation or Site Restoration Plan	
Appendix P	Health and Safety Plan	
Appendix Q	Existing Easements[8]	
Appendix R	Blasting Plan (may be preliminary at time of PEA filing)	
Appendix S	Traffic Control/Management Plan (may be preliminary at time of PEA filing)	
Appendix T	Worker Environmental Awareness Program (may preliminary at time of PEA filing)	
Appendix U	Helicopter Use and Safety Plan (may be preliminary at time of PEA filing)	
Appendix V	Electric and Magnetic Fields Management Plan (may be part of the Application rather than the PEA)	

[8] Easements should be provided military lands, conservation easements, or other lands where the real estate agreement specifies the range of activities that can be conducted

1 Executive Summary

This section will include, but is not limited to, the following:	PEA Section and Page Number[9]	Applicant Notes, Comments
1.1: Proposed Project Summary. Provide a summary of the proposed project and its underlying purpose and basic objectives.		
1.2: Land Ownership and Right-of-Way Requirements. Provide a summary of the existing and proposed land ownership and rights-of-way for the proposed project.		
1.3: Areas of Controversy. Identify areas of anticipated controversy and public concern regarding the project.		
1.4: Summary of Impacts a) Identify all impacts expected by the Applicant to be potentially significant. Identify and discuss Applicant Proposed Measures here and provide a reference to the full listing of Applicant Proposed Measures provided in the table described in Section 3.11 of this PEA Checklist. b) Identify any significant and unavoidable impacts that may occur.		
1.5: Summary of Alternatives. Summarize alternatives that were considered by the Applicant and the process and criteria that were used to select the proposed project.		
1.6: Pre-filing Consultation and Public Outreach Summary. Briefly summarize Pre-filing consultation and public outreach efforts that occurred and identify any significant outcomes that were incorporated into the proposed project.		
1.7: Conclusions. Provide a summary of the major PEA conclusions.		
1.8: Remaining Issues. Describe any major issues that must still be resolved.		

[9] The *PEA Section and Page Number* column and *Applicant Notes, Comments* column are intended to be filled out and provided with PEA submittals. The PEA Checklist is provided in Word to all Applicants to allow column resizing as appropriate to reduce PEA checklist length when completed for submittal. Landscape formatting may also be appropriate for completed PEA Checklist tables.

2 Introduction

2.1 Project Background

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
2.1.1: Purpose and Need a) Explain why the proposed project is needed. b) Describe localities the proposed project would serve and how the project would fit into the local and regional utility system. c) If the proposed project was identified by the California Independent System Operator (CAISO), thoroughly describe the CAISO's consideration of the proposed project and provide the following information: i. Include references to all CAISO Transmission Planning Processes that considered the proposed project. ii. Explain if the proposed project is considered an economic, reliability, or policy-driven project or a combination thereof. iii. Identify whether and how the Participating Transmission Owner recommended the project in response to a CAISO identified need, if applicable. iv. Identify if the CAISO approved the original scope of the project or an alternative and the rationale for their approval either for the original scope or an alternative. v. Identify how and whether the proposed project would exceed, combine, or modify in any way the CAISO identified project need. vi. If the Applicant was selected as part of a competitive bid process, identify the factors that contributed to the selection and CAISO's requirements for in-service date. d) If the project was not considered by the CAISO, explain why.		
(Natural Gas Storage Only) e) Provide storage capacity or storage capacity increase in billion cubic feet. If the project does not increase capacity, make this statement. f) Describe how existing storage facilities will work in conjunction with the proposed project. Describe the purchasing process (injection, etc.) and transportation arrangements this facility will have with its customers.		
2.1.2: Project Objectives a) Identify and describe the basic project objectives.[10] The objectives will include reasons for constructing the project based on its		

[10] Tangential project goals should not be included as basic project objectives, such as, minimizing environmental impacts, using existing ROWs and disturbed land to the maximum extent feasible, ensuring safety during construction and operation, building on property already controlled by the Applicant/existing site control. Goals of this type do not describe the underlying purpose or basic objectives but, rather, are good general practices for all projects.

purpose and need (i.e., address a specific reliability issue). The description of the project objectives will be sufficiently detailed to permit CPUC to independently evaluate the project need and benefits to accurately consider them in light of the potential environmental impacts. The basic project objectives will be used to guide the alternatives screening process, when applicable. b) Explain how implementing the project will achieve the basic project objectives and underlying purpose and need. c) Discuss the reasons why attainment of each basic objective is necessary or desirable.		
2.1.3: Project Applicant(s). Identify the project Applicant(s) and ownership of each component of the proposed project. Describe each Applicant's utility services and their local and regional service territories.		

2.2 Pre-filing Consultation and Public Outreach[11]

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
2.2.1: Pre-filing Consultation and Public Outreach a) Describe all Pre-filing consultation and public outreach that occurred, such as, but not limited to: i. CAISO ii. Public agencies with jurisdiction over project areas or resources that may occur in the project area iii. Native American tribes affiliated with the project area iv. Private landowners and homeowner associations v. Developers for large housing or commercial projects near the project area vi. Other utility owners and operators vii. Federal, state, and local fire management agencies b) Provide meeting dates, attendees, and discussion summaries, including any preliminary concerns and how they were addressed and any project alternatives that were suggested. c) Clearly identify any significant outcomes of consultation that were incorporated into the proposed project. d) Clearly identify any developments that could coincide or conflict with project activities (i.e., developments within or adjacent to a proposed ROW).		
2.2.2: Records of Consultation and Public Outreach. Provide contact information, notification materials, meeting dates and materials, meeting notes, and records of communication organized by entity as an Appendix to the PEA (Appendix G).		

[11] CPUC CEQA Unit Staff request that consultation and public outreach that occurs during the Pre-filing period and throughout environmental review include the assigned CPUC Staff person and CPUC consultant.

2.3 Environmental Review Process

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
2.3.1: Environmental Review Process. Provide a summary of the anticipated environmental review process and schedule.		
2.3.2: CEQA Review a) Explain why CPUC is the appropriate CEQA Lead agency. b) Identify other state agencies and any federal agencies that may have discretionary permitting authority over any aspect of the proposed project. c) Identify all potential involvement by federal, state, and local agencies not expected to have discretionary permitting authority (i.e., ministerial actions). d) Summarize the results of any preliminary outreach with these agencies as well as future plans for outreach.		
2.3.3: NEPA Review (if applicable). If review according to the National Environmental Policy Act (NEPA) is expected, explain the portions of the project that will require the NEPA review process. Discuss which agency is anticipated to be the NEPA Lead agency if discretionary approval by more than one federal agency is required.		
2.3.4: Pre-filing CEQA and NEPA Coordination. Describe the results of Pre-filing coordination with CEQA and NEPA review agencies (refer to CPUC's Pre-Filing Consultation Guidelines). Identify major outcomes of the Pre-filing coordination process and how the information was incorporated into the PEA, including suggestions on the type of environmental documents and joint or separate processes based on discussions with agency staff.		

2.4 Document Organization

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
2.4: PEA Organization. Summarize the contents of the PEA and provide an annotated list of its sections.		

3 Proposed Project Description[12]

3.1 Project Overview

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.1: Project Overview a) Provide a concise summary of the proposed project and components in a few paragraphs. b) Described the geographical location of the proposed project (i.e., county, city, etc.). c) Provide an overview map of the proposed project location.		

3.2 Existing and Proposed System

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.2.1: Existing System a) Identify and describe the existing utility system that would be modified by the proposed project, including connected facilities to provide context. Include detailed information about substations, transmission lines, distribution lines, compressor stations, metering stations, valve stations, nearby renewable generation and energy storage facilities, telecommunications facilities, control systems, SCADA systems, etc. b) Provide information on users and the area served by the existing system features. c) Explain how the proposed project would fit into the existing local and regional systems. d) Provide a schematic diagram of the existing system features. e) Provide detailed maps and associated GIS data for existing facilities that would be modified by the proposed project.		
3.2.2: Proposed Project System a) Describe the whole of the proposed project by component, including all new facilities and any modifications, upgrades, or expansions to existing facilities and any interrelated activities that are part of the whole of the action. b) Clearly identify system features that would be added, modified, removed, disconnected and left in place, etc. c) Identify the expected capacities of the proposed facilities, highlighting any changes from the existing system. If the project would not change existing capacities, make this statement. For electrical projects, provide the anticipated capacity increase in amps or megawatts or in the typical units for the types of facilities proposed. For gas projects, provide the total volume of gas to be		

[12] Applicant review of the Administrative Draft Project Description or sections of the Administrative Draft Project Description prepared for the CEQA document may be requested by CPUC CEQA Unit Staff to ensure technical accuracy.

delivered by the proposed facilities, anticipated system capacity increase (typically in million cubic feet per day), expected customers, delivery points and corresponding volumes, and the anticipated maximum allowable operating pressure(s). d) Describe the initial buildout and eventual full buildout of the proposed project facilities. For example, if an electrical substation or gas compressor station would be installed to accommodate additional demand in the future, then include the designs for both the initial construction based on current demand and the design for all infrastructure that could ultimately be installed within the planned footprint of an electric substation or compressor station. e) Explain whether the electric line or gas pipeline will create a second system tie or loop for reliability. f) Provide information on users and the area served by the proposed system features, highlighting any differences from the existing system. g) Provide a schematic diagram of the proposed system features. h) Provide detailed maps and associated GIS data for proposed facilities that would be installed, modified, or relocated by the proposed project.		
3.2.3: System Reliability. Explain whether the electric line or gas pipeline will create a second system tie or loop for reliability. Clearly explain and show how the proposed project relates to and supports the existing utility systems.		
3.2.4: Planning Area. Describe the system planning area served or to be served by the project. Clearly define the Applicant's term for the planning area (e.g., Electrical Needs Area or Distribution Planning Area).		

3.3 Project Components

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
Required for all Project Types		
3.3.1: Preliminary Design and Engineering a) Provide preliminary design and engineering information for all above-ground and below-ground facilities for the proposed project. The approximately locations, maximum dimensions of facilities, and limits of areas that would be needed to construction and operate the facilities should be clearly defined.[13] b) Provide preliminary design drawings for project features and explain the level of completeness (i.e., percentage). c) Provide detailed project maps (approximately 1:3,000 scale) and associated GIS data of all facility locations and boundaries with attributes and spatial geometry that corresponds to information in the Project Description.		

[13] Refer to Attachment 1 for mapping and GIS data requirements for the project layout and design.

3.3.2: Segments, Components, and Phases a) Define all project segments, components, and phases for the proposed project. b) Provide the length/area of each segment or component, and the timing of each development phase. c) Provide an overview map showing each segment and provide associated GIS data (may be combined with other mapping efforts).		
3.3.3: Existing Facilities a) Identify the types of existing facilities that would be removed or modified by the proposed project (i.e., conductor/cable, poles/towers, substations, switching stations, gas storage facilities, gas pipelines, service buildings, communication systems, etc.). b) Describe the existing facilities by project segment and/or component, and provide information regarding existing dimensions, areas/footprints, quantities, locations, spans, etc. c) Distinguish between above-ground and below-ground facilities and provide both depth and height ranges for each type of facility. For poles/towers, provide the installation method (i.e., foundation type or direct bury), and maximum above-ground heights and below-ground depths. d) Explain what would happen to the existing facilities. Would they be replaced, completely removed, modified, or abandoned? Explain why. e) Identify the names, types, materials, and capacity/volumes ranges (i.e., minimum and maximum) of existing facilities that would be installed or modified by the proposed project. f) Provide diagrams with dimensions representing existing facilities to provide context on how the proposed facilities would be different. g) Briefly describe the surface colors, textures, light reflectivity, and any lighting of existing facilities.		
3.3.4: Proposed Facilities a) Identify the types of proposed facilities to be installed or modified by the proposed project (e.g., conductor/cable, poles/towers, substations, switching stations, gas storage facilities, gas pipelines, service buildings, communication systems). b) Describe the proposed facilities by project segment and/or component, and provide information regarding maximum dimensions, areas/footprints, quantities, locations, spans, etc. c) Distinguish between above-ground and below-ground facilities and provide both depth and height ranges for each type of facility. For poles/towers, provide the installation method (i.e., foundation type or direct bury), and maximum above-ground heights and below-ground depths.		

d) Identify where facilities would be different (e.g., where unique or larger poles would be located, large guy supports or snub poles). e) Provide details about civil engineering requirements (i.e., permanent roads, foundations, pads, drainage systems, detention basins, spill containment, etc.). f) Distinguish between permanent facilities and any temporary facilities (i.e., poles, shoo-fly lines, mobile substations, mobile compressors, transformers, capacitors, switch racks, compressors, valves, driveways, and lighting). g) Identify the names, types, materials, and capacity/volumes ranges (i.e., minimum and maximum) of proposed facilities that would be installed or modified by the proposed project. h) Provide diagrams with dimensions representing existing facilities. i) Briefly describe the surface colors, textures, light reflectivity, and any lighting of proposed facilities.		
3.3.5: Other Potentially Required Facilities a) Identify and describe in detail any other actions or facilities that may be required to complete the project. For example, consider the following questions: i. Could the project require the relocation (temporary or permanent), modification, or replacement of unconnected utilities or other types of infrastructure by the Applicant or any other entity? ii. Could the project require aviation lighting and/or marking? iii. Could the project require additional civil engineering requirements to address site conditions or slope stabilization issues, such as pads and retaining walls, etc.? b) Provide the location of each facility and a description of the facility.		
3.3.6: Future Expansions and Equipment Lifespans a) Provide detailed information about the current and reasonably foreseeable plans for expansion and future phases of development. b) Provide the expected usable life of all facilities. c) Describe all reasonably foreseeable consequences of the proposed project (e.g., future ability to upgrade gas compressor station to match added pipeline capacity).		
Required for Certain Project Types		
3.3.7: Below-ground Conductor/Cable Installations (as Applicable) a) Describe the type of line to be installed (e.g., single circuit cross-linked polyethylene-insulated solid-dielectric, copper-conductor cables). b) Describe the type of casing the cable would be installed in (e.g., concrete-encased duct bank system) and provide the dimensions of the casing.		

c) Describe the types of infrastructure would likely be installed within the duct bank (e.g., transmission, fiber optics, etc.).		
3.3.8: Electric Substations and Switching Stations (as Applicable) a) Provide the number of transformer banks that will be added at initial and full buildout of the substation. Identify the transformer voltage and number of each transformer type. b) Identify any gas insulated switchgear that will be installed within the substation. c) Describe any operation and maintenance facilities, telecommunications equipment, and SCADA equipment that would be installed within the substation.		
3.3.9: Gas Pipelines (as Applicable). For each segment: a) Identify pipe diameter, number and length of exposed sections, classes and types of pipe to be installed, pressure of pipe, and cathodic protection for each linear segment. b) Describe new and existing inspection facilities (e.g., pig launcher sites). c) Describe system cross ties and laterals/taps. d) Identify the spacing between each valve station. e) Describe the compressor station, if needed, for any new or existing pipeline. f) Describe all pipelines and interconnections with existing and proposed facilities: i. Number of interconnections and locations and sizes; ii. All below-ground and above-ground installations; and iii. All remote facility locations for metering, telemetry, control.		
3.3.10: Gas Storage Facilities – Background and Resource Information (as Applicable) a) Provide detailed background information on the natural gas formation contributing to the existing or proposed natural gas facility, including the following: i. Description of overlying stratigraphy, especially caps ii. Description of production, injection, and intervening strata iii. Types of rock iv. Description of types of rocks in formation, including permeability or fractures v. Thickness of strata b) Provide a graphic and/or table showing formation thicknesses. c) Identify and describe any potential gas migration pathways, such as faults, permeable contacts, abandoned wells, underground water or other pipelines. d) Provide a summary and detailed cross-section diagrams of the geologic formations and structures of the oil/gas field or area. e) Provide the first well drilling and production history, abandonment procedures, inspections, etc. f) Describe production zones, including depth, types of formations, and characteristics of field/area.		

g) Describe the existing and proposed storage capacity and limiting factors, such as injection or withdrawal capacities. h) Describe existing simulation studies that were used to predict the reservoir pressure response under gas injection and withdrawal operations, and simulation studies for how the system would change as proposed. Provide the studies as a PEA Appendix. i) Provide the history of the oil/gas field or area.		
3.3.11: Gas Storage Facilities – Well-Head Sites (as Applicable). Describe the location, depth, size and completion information for all existing, abandoned, proposed production and injection, monitoring, and test wells.		
3.3.12: Gas Storage Facilities – Production and Injection (as Applicable) a) Provide the proposed storage capacity of production and injection wells. b) Provide production and injection pressures, depths, and rates. c) Provide production and injection cycles by day, week, and year. d) Describe existing and proposed withdrawal/production wells (i.e., size, depth, formations, etc.). e) Describe existing and proposed cushion gas requirements. f) Describe any cushion gas injection—formation the well is completed in (cushion gas formation), and injection information.		
3.3.13: Gas Storage Facilities – Electrical Energy (as Applicable). Describe all existing and proposed electric lines, telecommunications facilities, and other utilities/facilities (e.g., administrative offices, service buildings, and non-hazardous storage), and chemical storage associated with the proposed project.		
3.3.14: Telecommunication Lines (as Applicable) a) Identify the type of cable that is proposed and length in linear miles by segment. b) Identify any antenna and node facilities that are part of the project. c) For below-ground telecommunication lines, provide the depth of cable and type of conduit. d) For above-ground telecommunication lines, provide: i. Types of poles that will be installed (if new poles are required) ii. Where existing poles will be used iii. Any additional infrastructure (e.g., guy wires) or pole changes required to support the additional cable on existing poles		

3.4 Land Ownership, Rights-of-Way, and Easements

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.4.1: Land Ownership. Describe existing land ownership where each project component would be located. State whether the proposed		

project would be located on property(ies) owned by the Applicant or if additional property would be required.		
3.4.2: Existing Rights-of-Way or Easements a) Identify and describe existing rights-of-way (ROWs) or easements where project components would be located. Provide the approximately lengths and widths in each project area. b) Clearly state if project facilities would be replaced, modified, or relocated within existing ROWs or easements.		
3.4.3: New or Modified Rights-of-Way or Easements a) Describe new permanent or modified ROWs or easements that would be required. Provide the approximately lengths and widths in each project area. b) Describe how any new permanent or modified ROWs or easements would be acquired. c) Provide site plans identifying all properties/parcels and partial properties/parcels that may require acquisition and the anticipated ROWs or easements. Provide associated GIS data. d) Describe any development restrictions within new ROWs or easements, e.g., building clearances and height restrictions, etc. e) Describe any relocation or demolition of commercial or residential property/structures that may be necessary.		
3.4.4: Temporary Rights-of-Way or Easements f) Describe temporary ROWs or easements that would be required to access project areas, including ROWs or easements for temporary construction areas (i.e., staging areas or landing zones). g) Explain where temporary construction areas would be located with existing ROWs or easements for the project or otherwise available to the Applicant without a temporary ROW or easement. h) Describe how any temporary ROWs or easements would be acquired.		

3.5 Construction

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
3.5.1 Construction Access (All Projects)		
3.5.1.1: Existing Access Roads a) Provide the lengths, widths, ownership details (both public and private roads), and surface characteristics (i.e., paved, graveled, bare soil) of existing access roads that would be used during construction. Provide the area of existing roads that would be used (see example in Table 3 below). b) Describe any road modifications or stabilization that would be required prior to construction, including on the adjacent road		

shoulders or slopes. Identify any roads that would be expanded and provide the proposed width increases. c) Describe any procedures to address incidental road damage cause by project activities following construction. d) Provide detailed maps and associated GIS data for all existing access roads.		

Table 3. Access Roads

Type of Road	Description	Area Proposed Project
Existing Dirt Road	Typically double track. May have been graded previously. No other preparation required, although a few sections may need to be re-graded and crushed rock applied in very limited areas for traction.	_____ acres
New Permanent	Would be xx feet wide, bladed. No other preparation required although crushed rock may need to be applied in very limited areas for traction.	_____ acres
Overland Access	No preparation required. Typically grassy areas that are relatively flat. No restoration would be necessary.	_____ acres

3.5.1.2: New Access Roads a) Identify any new access roads that would be developed for project construction purposes, such as where any blading, grading, or gravel placement could occur to provide equipment access outside of a designated workspace.[14] b) Provide lengths, widths, and development methods for new access roads. c) Identify any temporary or permanent gates that would be installed. d) Clearly identify any roads that would be temporary and fully restored following construction. Otherwise it will be assumed the new access road is a permanent feature. e) Provide detailed maps and associated GIS data for all new access roads.		
3.5.1.3: Overland Access Routes a) Identify any overland access routes that would be used during construction, such as where vehicles and equipment would travel over existing vegetation and where blading, grading, or gravel placement would occur. b) Provide lengths and widths for new access roads. c) Provide detailed maps and associated GIS data for all overland access routes.		
3.5.1.4: Watercourse Crossings a) Identify all temporary watercourse crossings that would be required during construction. Provide specific methods and procedures for temporary watercourse crossings.		

[14] Temporary roads that would not require these activities should be considered an overland route.

b) Describe any bridges or culverts that replacement or installation of would be required for construction access. c) Provide details about the location, design and construction methods.		
3.5.1.5: Helicopter Access. If helicopters would be used during construction: a) Describe the types and quantities of helicopters that would be used during construction (e.g., light, medium, heavy, or sky crane), and a description of the activities that each helicopter would be used for. b) Identify areas for helicopter takeoff and landing. c) Describe helicopter refueling procedures and locations. d) Describe flight paths, payloads, and expected hours and durations of helicopter operation. e) Describe any safety procedures or requirements unique to helicopter operations, such as but not limited to obtaining a Congested Area Plan from the Federal Aviation Administration (FAA).		
3.5.2 Staging Areas (All Projects)		
3.5.2.1: Staging Area Locations a) Identify the locations of all staging area(s). Provide a map and GIS data for each.[15] b) Provide the size (in acres) for each staging area and the total staging area requirements for the project.		
3.5.2.2: Staging Area Preparation a) Describe any site preparation required, if known, or generally describe what might be required (i.e., vegetation removal, new access road, installation of rock base, etc.). b) Describe what the staging area would be used for (i.e., material and equipment storage, field office, reporting location for workers, parking area for vehicles and equipment, etc.). c) Describe how the staging area would be secured. Would a fence be installed? If so, describe the type and extent of the fencing. d) Describe how power to the site would be provided if required (i.e., tap into existing distribution, use of diesel generators, etc.). e) Describe any temporary lightning facilities for the site. f) Describe any grading activities and/or slope stabilization issues.		

[15] While not all potential local site staging areas will be known prior to selection of a contractor, it is expected that approximate area and likely locations of staging areas be disclosed. The identification of extra or optional staging areas should be considered to reduce the risk of changes after project approval that could necessitate further CEQA review.

3.5.3 Construction Work Areas (All Projects)		
3.5.3.1: Construction Work Areas a) Describe known work areas that may be required for specific construction activities (e.g., pole assembly, hillside construction)[16] b) Describe the types of activities that would be performed at each work area. Work areas may include but are not necessarily limited to: i. Helicopter landing zones and touchdown areas ii. Vehicle and equipment parking, passing, or turnaround areas iii. Railroad, bridge, or watercourse crossings iv. Temporary work pads for facility installation, modification, or removal v. Excavations and associated equipment work areas vi. Temporary guard structures vii. Pull-and-tension/stringing sites viii. Jack and bore pits, drilling areas and pull-back areas for horizontal directional drills ix. Retaining walls		
3.5.3.2 Work Area Disturbance a) Provide the dimensions of each work area including the maximum area that would be disturbed during construction (e.g., 100 feet by 200 feet) (see example in Table 4 below). b) Provide a table with temporary and permanent disturbance at each work area (in square feet or acres), and the total area of temporary and permanent disturbance for the entire project (in acres).		
3.5.3.3: Temporary Power. Identify how power would be provided at work area (i.e., tap into existing distribution, use of diesel generators, etc.). Provide the disturbance area for any temporary power lines.		
3.5.4 Site Preparation (All Projects)		
3.5.4.1: Surveying and Staking. Describe initial surveying and staking procedures for site preparation and access.		
3.5.4.2: Utilities a) Describe the process for identifying any underground utilities prior to construction (i.e., underground service alerts, etc.). b) Describe the process for relocating any existing overhead or underground utilities that aren't directly connected to the project system. c) Describe the process for installing any temporary power or other utility lines for construction.		

[16] Understanding that each specific work area may not be determined until the final work plan is submitted by the construction contractor, estimate total area likely to be disturbed.

Table 4. Work Areas

	Proposed Project (approximate metrics)
Pole Diameter:	
• Wood	_____ inches
• Self-Supporting Steel	_____inches
Lattice Tower Base Dimension:	
• Self-Supporting Lattice Structure	_____feet
Auger Hole Depth:	
• Wood	_____ to _____ feet
• Self-Supporting Steel	_____ to _____ feet
Permanent Footprint per Pole/Tower:	
• Wood	_____ sq. feet
• Self-Supporting Steel	_____ sq. feet
• Self-Supporting Steel Tower	_____ sq. feet
Number of Poles/Towers:	
• Wood	_____
• Self-Supporting Steel	_____
• Self-Supporting Steel Tower	_____
Average Work Area around Pole/Towers (e.g., for old pole removal and new pole installation):	
• Tangent structure work areas	_____ sq. feet
• Dead End / Angle structure work areas	_____ sq. feet
Total Permanent Footprint for Poles/Towers	Approximately _____ acres

3.5.4.3: Vegetation Clearing a) Describe what types of vegetation clearing may be required (e.g., tree removal, brush removal, flammable fuels removal) and why (e.g., to provide access, etc.). b) Provide calculations of temporary and permanent disturbance of each vegetation community and include all areas of vegetation removal in the GIS database. Distinguish between disturbance that would occur in previously developed areas (i.e., paved, graveled, or otherwise urbanized), and naturally vegetated areas. c) Describe how each type of vegetation removal would be accomplished. d) Describe the types of equipment that would be used for vegetation removal.		
3.5.4.4: Tree Trimming Removal a) For electrical projects, distinguish between tree trimming as required under CPUC General Order 95-D and tree removal. b) Identify the types, locations, approximate numbers, and sizes of trees that may need to be removed or trimmed substantially. c) Identify potentially protected trees that may be removed or substantially trimmed, such as but not limited to riparian trees, oaks trees, Joshua trees, or palm trees.		

d) Describe the types of equipment that would typically be used for tree removal.		
3.5.4.5: Work Area Stabilization. Describe the processes to stabilize temporary work areas and access roads including the materials that would be used (e.g., gravel).		
3.5.4.6: Grading a) Describe any earth moving or substantial grading activities (i.e., grading below a 6-inch depth) that would be required and identify locations where it would occur. b) Provide estimated volumes of grading (in cubic yards) including total cut, total fill, cut that would be reused, cut that would be hauled away, and clean fill that would be hauled to the site.		
3.5.5 Transmission Line Construction (Above Ground)		
3.5.5.1: Poles/Towers a) Describe the process and equipment for removing poles, towers, and associated foundations for the proposed project (where applicable). Describe how they would be disconnected, demolished, and removed from the site. Describe backfilling procedures and where the material would be obtained. b) Describe the process and equipment for installing or otherwise modifying poles and towers for the proposed project. Describe how they would be put into place and connected to the system. Identify any special construction methods (e.g., helicopter installation) at specific locations or specific types of poles/towers. c) Describe how foundations, if any, would be installed. Provide a description of the construction method(s), approximate average depth and diameter of excavation, approximate volume of soil to be excavated, approximate volume of concrete or other backfill required, etc. for foundations. Describe what would be done with soil removed from a hole/foundation site. d) Describe how the poles/towers and associated hardware would be delivered to the site and assembled. e) Describe any pole topping procedures that would occur, identify specific locations and reasons, and describe how each facility would be modified. Describe any special methods that would be required to top poles that may be difficult to access.		
3.5.5.2: Aboveground and Underground Conductor/Cable a) Provide a process-based description of how new conductor/cable would be installed and how old conductor/cable would be removed, if applicable. b) Identify where conductor/cable stringing/installation activities would occur. c) Provide a diagram of the general sequencing and equipment that would be used. d) Describe the conductor/cable splicing process.		

e) Provide the general or average distance between pull-and-tension sites. Describe the approximate dimensions and where pull-and-tension sites would generally be required (as indicated by the designated work areas), such as the approximate distance to pole/tower height ratio, at set distances, or at significant direction changes. Describe the equipment that would be required at these sites. f) For underground conductor/cable installations, describe all specialized construction methods that would be used for installing underground conductor or cable. If vaults are required, provide their dimensions and location/spacing along the alignment. Provide a detailed description for how the vaults would be delivered to the site and installed. g) Describe any safety precautions or areas where special methodology would be required (e.g., crossing roadways, stream crossing).		
3.5.5.3: Telecommunications. Identify the procedures for installation of proposed telecommunication cables and associated infrastructure.		
3.5.5.4: Guard Structures. Identify the types of guard structures that would be used at crossings of utility lines, roads, railroads, highways, etc. Describe the different types of guard structures or methods that may be used (i.e., buried poles and netting, poles secured to a weighted object, bucket trucks, etc.). Describe any pole installation and removal procedures associated with guard structures. Describe guard structure installation and removal process and duration that guard structures would remain in place.		
3.5.5.5: Blasting a) Describe any blasting that may be required to construct the project. b) If blasting may be required, provide a Blasting Plan that identifies the blasting locations; types and amounts of blasting agent to be used at each location; estimated impact radii; and, noise estimates. The Blasting Plan should be provided as an Appendix to the PEA. c) Provide a map identifying the locations where blasting may be required with estimated impact radii. Provide associated GIS data.		
3.5.6 Transmission Line Construction (Below Ground)		
3.5.6.1: Trenching a) Describe the approximate dimensions of the trench (e.g., depth, width). b) Provide the total approximate volume of material to be removed from the trench, the amount to be used as backfill, and any amount to subsequently be removed/disposed of offsite in cubic yards. c) Describe the methods used for making the trench (e.g., saw cutter to cut the pavement, backhoe to remove, etc.). d) Provide off-site disposal location, if known, or describe possible option(s). e) Describe if dewatering would be anticipated and if so, how the trench would be dewatered, the anticipated flows of the water,		

whether there would be treatment, and how the water would be disposed of. f) Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants that could be exposed from trenching operations. g) If a pre-existing hazardous waste were encountered, describe the process of removal and disposal. h) Describe the state of the ground surface after backfilling the trench. i) Describe standard Best Management Practices to be implemented.		
3.5.6.2: Trenchless Techniques (Microtunnel, Jack and Bore, Horizontal Directional Drilling) a) Identify any locations/features for which the Applicant expects to use a trenchless (i.e., microtunneling, jack and bore, horizontal directional drilling) crossing method and which method is planned for each crossing. b) Describe the methodology of the trenchless technique. c) Provide the approximate location and dimensions of the sending and receiving pits. d) Describe the methodology of excavating and shoring the pits. e) Provide the total volume of material to be removed from the pits, the amount to be used as backfill, and the amount subsequently to be removed/disposed of offsite in cubic yards. f) Describe process for safe handling of drilling mud and bore lubricants. g) Describe the process for detecting and avoiding "fracturing-out" during horizontal directional drilling operations. h) Describe the process for avoiding contact between drilling mud/lubricants and stream beds. i) If engineered fill would be used as backfill, indicate the type of engineered backfill and the amount that would be typically used (e.g., the top 2 feet would be filled with thermal-select backfill). j) Describe if dewatering is anticipated and, if so, how the pits would be dewatered, the anticipated flows of the water, whether there would there be treatment, and how the water would be disposed of. k) Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants. Describe the process of disposing of any pre-existing hazardous waste that is encountered during excavation. l) Describe any standard BMPs that would be implemented for trenchless construction.		
3.5.7 Substation, Switching Stations, Gas Compressor Stations		
3.5.7.1: Installation or Facility Modification. Describe the process and equipment for removing, installing, or modifying any substations, switching stations, or compressor stations including: a) Transformers/ electric components b) Gas components c) Control and operation buildings d) Driveways		

e) Fences f) Gates g) Communication systems (SCADA) h) Grounding systems		
3.5.7.2: Civil Works. Describe the process and equipment required to construct any slope stabilization, drainage, retention basins, and spill containment required for the facility.		
3.5.8 Gas Pipelines		
3.5.8.1: Gas Pipeline Construction. Describe the process for proposed pipeline construction including site development, trenching and trenchless techniques, pipe installation, and backfilling.		
3.5.8.2: Water Crossings. Describe water feature crossings that will occur during trenching, the method of trenching through stream crossings, and the process for avoiding impacts to the water features required for pipeline construction. Identify all locations where the pipeline will cross water features. Cite to any associated geotechnical or hydrological investigations completed and provide a full copy of each report as an Appendix to the PEA.[17]		
3.5.8.3: Gas Pipeline Other Requirements a) Describe hydrostatic testing process including pressures, timing, source of flushing water, discharge of water. b) Describe energy dissipation basin, and the size and length of segments to be tested. c) Describe pig launching locations and any inline inspection techniques used during or immediately post construction.		
3.5.9 Gas Storage Facilities		
3.5.9.1: Gas Storage Construction a) Describe the process for constructing the gas storage facility including constructing well pads and drilling wells. b) Describe the specific construction equipment that would be used, such as the type of drill rig (i.e., size, diesel, electric, etc.), depth of drilling, well-drilling schedule and equipment.		
3.5.9.2: Drilling Muds and Fluids. Describe the use of any drilling muds, fluids, and other drilling materials. Provided estimated types and quantities.		
3.5.10 Public Safety and Traffic Control (All Projects)		
3.5.10.1: Public Safety a) Describe specific public safety considerations during construction and best management practices to appropriately manage public safety. Clearly state when and where they each safety measure would be applied.		

[17] If a geotechnical study is not available at the time of PEA filing, provide the best information available.

b) Identify procedures for managing work sites in urban areas, covering open excavations securely, installing barriers, installing guard structures, etc. c) Identify specific project areas where public access may be restricted for safety purposes and provide the approximate durations and timing of restricted access at each location.		
3.5.10.2: Traffic Control a) Describe traffic control procedures that would be implemented during construction. b) Identify the locations, process, and timing for closing any sidewalks, lanes, roads, trails, paths, or driveways to manage public access. c) Identify temporary detour routes and locations. d) Provide a preliminary Traffic Control Plan(s) for the project.		
3.5.10.3: Security. Describe any security measures, such as fencing, lighting, alarms, etc. that may be required. State if security personnel will be stationed at project areas and anticipated duration of security.		
3.5.10.4: Livestock. Describe any livestock fencing or guards that may be necessary to prevent livestock from entering project areas. State if the fencing would be electrified and if so, how it would be powered.		
3.5.11 Dust, Erosion, and Runoff Controls (All Projects)		
3.5.11.1: Dust. Describe specific best management practices that would be implemented to manage fugitive dust.		
3.5.11.2: Erosion. Describe specific best management practices that would be implemented to manage erosion.		
3.5.11.3: Runoff. Describe specific best management practices that would be implemented to manage stormwater runoff and sediment.		
3.5.12 Water Use and Dewatering (All Projects)		
3.5.12.1: Water Use. Describe the estimated volumes of water that would be used by construction activity (e.g., dust control, compaction, etc.). State if recycled or reclaimed water would be used and provide estimated volumes. Identify the anticipated sources where the water would be acquired or purchased. Identify if the source of water is groundwater and the quantity of groundwater that could be used.		
3.5.12.2: Dewatering a) Describe dewatering procedures during construction, including pumping, storing, testing, permitted discharging, and disposal requirements that would be followed. b) Describe the types of equipment and workspace considerations to be used to dewater, store, transport, or discharge extracted water.		
3.5.13 Hazardous Materials and Management (All Projects)		
3.5.13.1: Hazardous Materials a) Describe the types, uses, and volumes of all hazardous materials that would be used during construction. b) State if herbicides or pesticides may be used during construction.		

c) If a pre-existing hazardous waste were encountered, describe the process of removal and disposal.		
3.5.13.2: Hazardous Materials Management a) Identify specific best management practices that would be followed for transporting, storing, and handling hazardous materials. b) Identify specific best management practices that would be followed in the event of an incidental leak or spill of hazardous materials. c) Provide a Hazardous Substance Control and Emergency Response Plan / Hazardous Waste and Spill Prevention Plan as an Appendix to the PEA, if appropriate.		
3.5.14 Waste Generation and Management (All Projects)		
3.5.14.1: Solid Waste a) Describe solid waste streams from existing and proposed facilities during construction. b) Identify procedures to be implemented to manage solid waste, including collection, containment, storage, treatment, and disposal. c) Provide estimated total volumes of solid waste by construction activity or project component. d) Describe the recycling potential of solid waste materials and provide estimated volumes of recyclable materials by construction activity or project component. e) Identify the locations of appropriate disposal and recycling facilities where solid wastes would be transported.		
3.5.14.2: Liquid Waste a) Describe liquid waste streams during construction (i.e., sanitary waste, drilling fluids, contaminated water, etc.) b) Describe procedures to be implemented to manage liquid waste, including collection, containment, storage, treatment, and disposal. c) Provide estimated volumes of liquid waste generated by construction activity or project component. d) Identify the locations of appropriate disposal facilities where liquid wastes would be transported.		
3.5.14.3: Hazardous Waste a) Describe potentially hazardous waste streams during construction and procedures to be implemented to manage hazardous wastes, including collection, containment, storage, treatment, and disposal. b) If large volumes of hazardous waste are anticipated, such as from a pre-existing contaminant in the soil that must be collected and disposed of, provide estimated volumes of hazardous waste that would be generated by construction activity or project component. c) Identify the locations of appropriate disposal facilities where hazardous wastes would be transported.		
3.5.15 Fire Prevention and Response (All Projects)		
3.5.15.1: Fire Prevention and Response Procedures. Describe fire prevention and response procedures that would be implemented during		

construction. Provide a Construction Fire Prevention Plan or specific procedures as an Appendix to the PEA.		
3.5.15.2: Fire Breaks. Identify any fire breaks (i.e., vegetation clearance) requirements around specific project activities (i.e., hot work). Ensure that such clearance buffers are included in the limits of the defined work areas, and the vegetation removal in that area is attributed to Fire Prevention and Response (refer to 3.5.4.3: Vegetation Clearing).		

3.6 Construction Workforce, Equipment, Traffic, and Schedule

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
3.6.1: Construction Workforce a) Provide the estimated number of construction crew members. In the absence of project-specific data, provide estimates based on past projects of a similar size and type. b) Describe the crew deployment. Would crews work concurrently (i.e., multiple crews at different sites); would they be phased? How many crews could be working at the same time and where? c) Describe the different types of activities to be undertaken during construction, the number of crew members for each activity (i.e. trenching, grading, etc.), and number and types of equipment expected to be used for the activity. Include a written description of the activity. See example in Table 5.		
3.6.2: Construction Equipment. Provide a tabular list of the types of equipment expected to be used during construction of the proposed project including the horsepower. Define the equipment that would be used by each phase as shown in the example table below (Table 5).		

Table 5. Construction Equipment and Workforce

Work Activity				Activity Production				
Equipment Description	Estimated Horse-power	Probable Fuel Type	Equipment Quantity	Estimated Workforce	Estimated Start Date	Estimated End Date	Duration of Use (Hrs./Day)	Estimated Production
Survey				**4**	**January 2020**	**December 2020**		**358 Miles**
1-Ton Truck, 4x4	300	Diesel	2		January 2020	December 2020	10	1 Mile/Day
Staging Yards				**5**	**DOP**			
1-Ton Truck, 4x4	300	Diesel	1		Duration of Project		4	
R/T Forklift	350	Diesel	1				5	
Boom/Crane Truck	350	Diesel	1				5	
Water Truck	300	Diesel	2				10	
Jet A Fuel Truck	300	Diesel	1				4	
Truck, Semi-Tractor	500	Diesel	1				6	
Road Work				**6**	**January 2020**	**March 2020**		**426 Miles**
1-Ton Truck, 4x4	300	Diesel	2		January 2020	March 2020	5	
Backhoe/Front Loader	350	Diesel	1		January 2020	March 2020	7	
Track Type Dozer	350	Diesel	1		January 2020	March 2020	7	
Motor Grader	350	Diesel	1		January 2020	March 2020	5	
Water Truck	300	Diesel	2		January 2020	March 2020	10	
Drum Type Compactor	250	Diesel	1		January 2020	March 2020	5	
Excavator	300	Diesel	1		January 2020	February 2020	7	
Lowboy Truck/Trailer	500	Diesel	1		January 2020	February 2020	4	

3.6.3: Construction Traffic a) Describe how the construction crews and their equipment would be transported to and from the proposed project site. b) Provide vehicle type, number of vehicles, and estimated hours of operation per day, week, and month for each construction activity and phase. c) Provide estimated vehicle trips and vehicles miles traveled (VMT) for each construction activity and phase. Provide separate values for construction crews commuting, haul trips, and other types of construction traffic.		
3.6.4: Construction Schedule a) Provide the proposed construction schedule (e.g., month and year) for each segment or project component, and for each construction activity and phase. b) Provide and explain the sequencing of construction activities, and if they would or would not occur concurrently. c) Provide the total duration of each construction activity and phase in days or weeks. d) Identify seasonal considerations that may affect the construction schedule, such as weather or anticipated wildlife restrictions, etc. The proposed construction should account for such factors.		
3.6.5: Work Schedule a) Describe the anticipated work schedule, including the days of the week and hours of the day when work would occur. Clearly state if work would occur at night or on weekends and identify when and where this could occur. b) Provide the estimated number of days or weeks that construction activities would occur at each type of work area. For example, construction at a stationary facility or staging area may occur for the entire duration of construction, but construction at individual work areas along a linear project would be limited to a few hours, days or weeks, and only a fraction of the total construction period.		

3.7 Post-Construction

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.7.1: Configuring and Testing. Describe the process and duration for post-construction configuring and testing of facilities. Describe the number of personnel and types of equipment that would be involved.		
3.7.2: Landscaping. Describe any landscaping that would be installed. Provide a conceptual landscape plan that identifies the locations and types of plantings that will be used. Identify whether plantings will include container plants or seeds. Include any water required for landscaping in the description of water use above.		

3.7.3 Demobilization and Site Restoration		
3.7.3.1: Demobilization. Describe the process for demobilization after construction activities, but prior to leaving the work site. For example, describe final processes for removing stationary equipment and materials, etc.		
3.7.3.2: Site Restoration. Describe how cleanup and post-construction restoration would be performed (i.e., personnel, equipment, and methods) on all project ROWs, sites, and extra work areas. Things to consider include, but are not limited to, restoration of the following: a) Restoring natural drainage patterns b) Recontouring disturbed soil c) Removing construction debris d) Vegetation e) Permanent and semi-permanent erosion control measures f) Restoration of all disturbed areas and access roads, including restoration of any public trails that are used as access, as well as any damaged sidewalks, agricultural infrastructure, or landscaping, etc. g) Road repaving and striping, including proposed timing of road restoration for underground construction within public roadways		

3.8 Operation and Maintenance

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.8.1: Regulations and Standards a) Identify and describe all regulations and standards applicable to operation and maintenance of project facilities. b) Provide a copy of any applicable Wildfire Management Plan and describe any special procedures for wildfire management.		
3.8.2: System Controls and Operation Staff a) Describe the systems and methods that the Applicant would use for monitoring and control of project facilities (e.g., on-site control rooms, remote facilities, standard monitoring and protection equipment, pressure sensors, automatic shut-off valves, and site and equipment specific for monitoring and control such as at natural gas well pads). b) If new full-time staff would be required for operation and/or maintenance, provide the number of positions and purpose.		
3.8.3: Inspection Programs a) Describe the existing and proposed inspection programs for each project component, including the type, frequency, and timing of scheduled inspections (i.e., aerial inspection, ground inspection, pipeline inline inspections). b) Describe any enhanced inspections, such as within any High Fire Threat Districts consistent with applicable Wildfire Management Plan requirements.		

c) Describe the inspection processes, such as the methods, number of crew members, and how access would occur (i.e., walk, vehicle, all-terrain vehicle, helicopter, drone, etc.). If new access would be required, describe any restoration that would be provided for the access roads.		
3.8.4: Maintenance Programs a) Describe the existing and proposed maintenance programs for each project component. b) Describe scheduled maintenance or facility replacement after the designated lifespan of the equipment. c) Identify typical parts and materials that require regular maintenance and describe the repair procedures. d) Describe any access road maintenance that would occur. e) Describe maintenance for surface or color treatment. f) Describe cathodic protection maintenance that would occur. g) Describe ongoing landscaping maintenance that would occur.		
3.8.5: Vegetation Management Programs a) Describe vegetation management programs within and surrounding project facilities. Distinguish between any different types of vegetation management. b) Describe any enhanced vegetation management, such as within any High Fire Threat Districts consistent with any applicable Wildfire Management Plan requirements. Identify the areas where enhanced vegetation management would be conducted.		

3.9 Decommissioning

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.9.1: Decommissioning. Provide detailed information about the current and reasonably foreseeable plans for the disposal, recycling, or future abandonment of all project facilities.		

3.10 Anticipated Permits and Approvals

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.10.1: Anticipated Permits and Approvals. Identify all necessary federal, state, regional, and local permits that may be required for the project. For each permit, list the responsible agency and district/office representative with contact information, type of permit or approval, and status of each permit with date filed or planned to file. For example: a) Federal Permits and Approvals i. U.S. Fish and Wildlife Service ii. U.S. Army Corps of Engineers iii. Federal Aviation Administration iv. U.S. Forest Service		

v. U.S. Department of Transportation – Office of Pipeline Safety vi. U.S. Environmental Protection Agency (Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act) b) State and Regional Permits i. California Department of Fish and Wildlife ii. California Department of Transportation iii. California State Lands Commission iv. California Coastal Commission v. State Historic Preservation Office, Native American Heritage Commission vi. State Water Resources Control Board vii. California Division of Oil, Gas and Geothermal Resources viii. Regional Air Quality Management District ix. Regional Water Quality Control Board (National Pollutant Discharge Elimination System General Industrial Storm Water Discharge Permit) x. Habitat Conservation Plan Authority (if applicable) See also Table 6 of example permitting requirements and processes.		
3.10.2: Rights-of-Way or Easement Applications. Demonstrate that applications for ROWs or other proposed land use have been or soon will be filed with federal, state, or other land-managing agencies that have jurisdiction over land that would be affected by the project (if any). Discuss permitting plans and timeframes and provide the contact information at the federal agency(ies) approached.		

3.11 Applicant Proposed Measures

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.11 Applicant Proposed Measures a) Provide a table with the full text of any Applicant Proposed Measure. Where applicable, provide a copy of Applicant procedures, plans, and standards referenced in the Applicant Proposed Measures. b) Within Chapter 5, describe the basis for selecting a particular Applicant Proposed Measure and how the Applicant Proposed Measure would reduce the impacts of the project.[18] c) Carefully consider each CPUC Draft Environmental Measure identified in Chapter 5 of this PEA Checklist. The CPUC Draft Environmental Measures will be applied to the proposed project where applicable.		

[18] Applicant Proposed Measures that use phrases, such as, "as practicable" or other conditional language are not acceptable and will be superseded by Mitigation Measures if required to avoid or reduce a potentially significant impact.

Table 6. Example Permitting Requirements and Processes

Note: In addition to the CPCN or PTC, the applicant may also be required to secure resource agency permits for the project.

Disclaimer: Below is a general list of permits required for transmission projects. Permit requirements for individual projects may vary slightly depending on project conditions.

Agency	Permit	Regulation	Protected Resource	Trigger	Application Process	Timing
				Federal		
Army Corps of Engineers	404 Permit	Clean Water Act	Waters of the United States (including wetlands)	Placement of dredge or fill material into waters of the U.S., including wetlands. If project impacts less than 0.5 acres a **nationwide permit (NWP)** is typically issued	**NWP:** prepare a preconstruction notification (PCN) along with the draft Corps's application (Engineer Form 4345). Information in the PCN includes, but is not limited to: results of wetland delineation including areas of waters of the U.S.; temporary and permanent impacts to waters of the U.S. and discussion of avoidance; construction techniques, timeline, and equipment that would be used; special status species that potentially occur in the project area, and discussion of mitigation (if applicable) to replace wetlands	**NWP:** takes approximately nine months from the date of application submittal (depending on level of impacts and level of consultation required by other agencies). Initial review is 30 days after which application is deemed complete or additional information is requested.
				If project would impact more than 0.5 acres a **regional or individual permit** may be required.	**Regional or Individual Permit:** Same requirements as NWP as well as preparation and submittal of 404(b)(1) Alternatives analysis which identifies the Least Environmentally Damaging Practicable Alternative (LEDPA). Public notice also required	**Regional or Individual Permit:** An additional three to six months may be required on top of the nine months expected for an NWP. A 30 day public notice is also required to inform the public about the project before the Corps issues the permit.
USFWS	Section 7 Consultation	Federal Endangered Species Act	Federally Listed Species	Potential impact to a federally listed threatened or endangered species	Biological Assessment (BA) prepared and submitted to Corps. BA contains information on each species and describes potential for "take" of species and/or habitat.	The timeline for processing and receiving a formal **Biological Opinion (BO)** from USFWS can be six months to a year from when the Corps has initiated consultation and depending on the level of impact to listed species. The typical timeline for issuance of a BO is no less than 135 days after acceptance of the BA as complete.
US Department of Agriculture, Forest Service	Special Use Authorization	National Forest Management Act/NEPA	National Forest lands	Use of federal lands managed by the USDA Forest Service for a transmission line. Typically constitutes a Major Federal Action which in turn triggers NEPA analysis.	**Special Use Authorization Application:** prepare a special use application for consideration by the Forest Service. Prior to submitting a proposal, applicant is required to arrange a preapplicaiton meeting at the local Forest Service office. Application typically includes project plan, operating plans, liability insurance, licenses/registrations and other documents. If it is determined that NEPA is required either an EA or EIS would be prepared. The NEPA document may be prepared jointly with the CEQA document.	Revies of Special Use Authorization applications is often dependent upon what level of NEPA analysis is required. An EA is typically 9-12 months, and EIS is generally 18 months. NEPA process may occur concurrently with CEQA process.
US Department of the Interior, Bureau of Land Management	Right-of-Way Grant	Federal Land Policy and Management Act/NEPA	Federal Lands	Use of federal lands managed by the BLM for a transmission line. Typically constitutes a Major Federal Action which in turn triggers NEPA analysis.	**Right-of-Way Application**: Contact the BLM office with management responsibility. Obtain an application form "Application for Transportation and Utility Systems and Facilities on Federal Lands". Arrange a pre-application meeting with a BLM Realty Specialist or appropriate staff member. Submit completed application to the appropriate BLM office. If it is determined that NEPA is required either an EA or EIS would be prepared. The NEPA document may be prepared jointly with the CEQA document.	BLM attempts to review completed applications within 60 days of submittal. Full timing is often dependent upon what level of NEPA analysis is required. An EA is typically 9-12 months, and EIS is generally 18 months. NEPA process may occur concurrently with CEQA process.

Agency	Permit	Regulation	Protected Resource	Trigger	Application Process	Timing
			State (continued)			
State Historic Preservation Officer (SHPO)	Section 106 National Historic Preservation Act (NHPA)	National Historic Preservation Act	Cultural and/or historical resources	Required if there are potential impacts to cultural and/or historical resources that are listed or eligible for listing on the National Register of Historic Places.	Information on cultural and historical resources gathered during the draft CEQA document preparation is included in a 106 Technical Report and submitted to the Corps along with the Area of Potential Effect (APE) map. The information is then evaluated by the Corps' cultural resources evaluator for potential adverse effects within the APE. Depending upon the level of potential adverse effect, the Corps then forwards its finding to SHPO for concurrence or begins the process for a Memorandum of Agreement (MOA). Native American consultation is also mandatory for the 106 process but can begin during preparation of the environmental document. All letters and correspondence for the Native American consultation must be provided to the Corps.Consultation with federally-recongized tribes may require a more extensive consultation.	Once SHPO has received the Corps' determination, it has approximately 60 days to agree or request additional information. However, SHPO has recently become more involved in projects and this timeframe is only an estimate and if a potential adverse effect to cultural or historical resources could occur, the SHPO process can take up to a year or more. Depending on the level of impacts to cultural resources, the Corps may determine no effect and issue the permit before receiving concurrence from SHPO.
California State Lands Commission (CSLC)	Right of Way Lease Agreement	Division 6 of the California Public Resources Code	California Sovereign Lands	May be triggered if the transmission line crosses state lands under the jurisdiction of the CSLC, which includes the beds of 1) more than 120 rivers, streams and sloughs; 2) nearly 40 non-tidal navigable lakes, such as Lake Tahoe and Clear Lake; 3) the tidal navigable bays and lagoons; and 4) the tide and submerged lands adjacent to the entire coast and offshore islands of the State from the mean high tide line to three nautical miles offshore.	Leases or permits may be issued to qualified applicants and the Commission shall have broad discretion in all aspects of leasing including category of lease or permit and which use, method or amount of rental is most appropriate, whether competitive bidding should be used in awarding a lease, what term should apply, how rental should be adjusted during the term, whether bonding and insurance should be required and in what amounts, whether an applicant is qualified based on what it deems to be in the best interest of the State.	Most coordination should be done concurrently with the CEQA process to ensure that any CSLC-required issues are addressed under CEQA. Once a final route/alternative is selected, the lease process may take two to three months for final Commission approval.
			Local / Other			
Air Quality Management District or Air Pollution Control District	Permit to Construct	Federal Clean Air Act	Air Quality	Depends on the air disctrict involved; may not be required for most transmission projects. Some air districts have a trigger level based on disturbed acreage.	Application forms need to be prepared and submiited to the local AQMD or APCD	Typically 30 to 90 days after submittal of a complete application.

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[19] Permitting is project specific. This table is provided for discussion purposes.

3.12 Project Description Graphics, Mapbook, and GIS Requirements

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.12.1: Graphics. Provide diagrams of the following as applicable: a) All pole, tower, pipe, vault, conduit, and retaining wall types b) For poles, provide typical drawings with approximate diameter at the base and tip; for towers, estimate the width at base and top. c) A typical detail for any proposed underground duct banks and vaults d) All substation, switchyard, building, and facility layouts e) Trenching, drilling, pole installation, pipe installation, vault installation, roadway construction, facility removal, helicopter uses, conductor installation, traffic control, and other construction activities where a diagram would assist the reader in visualizing the work area and construction approach f) Typical profile views of proposed aboveground facilities and existing facilities to be modified within the existing and proposed ROW (e.g., typical cross-section of existing and proposed facilities by project segment). g) Photos of representative existing and proposed structures		
3.12.2: Mapbook. Provide a detailed mapbook on an aerial imagery basemap at a scale between 1:3000 and 1:6000 (or as appropriate and legible) that show mileposts, roadways, and all project components and work areas including: a) All proposed above-ground and underground structure/facility locations (e.g., poles, conductor, substations, compressor stations, telecommunication lines, vaults, duct bank, lighting, markers, etc.) b) All existing structures/facilities that would be modified or removed c) Identify by milepost where existing ROW will be used and where new ROW or land acquisition will be required. d) All permanent work areas including permanent facility access e) All access roads including, existing, temporary, and new permanent access f) All temporary work areas including staging, material storage, field offices, material laydown, temporary work areas for above ground (e.g., pole installation) and underground facility construction (e.g., trenching and duct banks), helicopter landing zones, pull and tension sites, guard structures, shoo flys etc. g) Areas where special construction methods (e.g., jack and bore, HDD, blasting, retaining walls etc.) may need to be employed		

h) Areas where vegetation removal may occur i) Areas to be heavily graded and where slope stabilization measures would be employed including any retaining walls		
3.12.3: GIS Data. Provide GIS data for all features and ROW shown on the detailed mapbook.		
3.12.4: GIS Requirements. Provide the following information for each pole/tower that would be installed and for each pole/tower that would be removed: a) Unique ID number and type of pole (e.g., wood, steel, etc.) or tower (e.g., self-supporting lattice) both in a table and in the attributes of the GIS data provided b) Identify pole/tower heights and conductor sizes in the attributes of the GIS data provided.		
3.12.5: Natural Gas Facilities GIS Data. For natural gas facilities, provide GIS data for system cross ties and all laterals/taps, valve stations, and new and existing inspection facilities (e.g., pig launcher sites).		

4 Description of Alternatives

All Applicants will assume that alternatives will be required for the environmental analysis and that an EIR will be prepared unless otherwise instructed by CPUC CEQA Unit Staff in writing prior to application filing. See PEA Requirements at the beginning of this checklist document. The consideration and discussion of alternatives will adhere to CEQA Guidelines Section 15126.6. The description of alternatives will be provided in this chapter of the PEA, and the comparison of each alternative to the proposed project is provided in PEA Chapter 6. The amount of detail required for the description of various alternatives to the proposed project and what may be considered a reasonable range of alternatives will be discussed with CPUC during Pre-filing.

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
4.1 Alternatives Considered. Identify alternatives to the proposed project.[20] Include the following: a) All alternatives to the proposed project that were suggested, considered, or studied by the CAISO or by CAISO stakeholders b) Alternatives suggested by the public or agencies during public outreach efforts conducted by the Applicant c) Reduced footprint alternatives, including, e.g., smaller diameter pipelines and space for fewer electric transformers d) Project phasing options (e.g., evaluate the full build out for environmental clearance but consider an initial, smaller buildout that would only be expanded [in phases] if needed) e) Alternative facility and construction activity sites (e.g., substation, compressor station, drilling sites, well-head sites, staging areas) f) Renewable, energy conservation, energy efficiency, demand response, distributed energy resources, and energy storage alternatives g) Alternatives that would avoid or limit the construction of new transmission-voltage facilities or new gas transmission pipelines h) Other technological alternatives (e.g., conductor type) i) Route alternatives and route variations j) Alternative engineering or technological approaches (e.g., alternative types of facilities, or materials, or configurations) k) Assign an identification label and brief, descriptive title to each alternative described in this PEA chapter (e.g., Alternative A: No Project; Alterative B: Reduced Footprint 500/115-kV Substation; Alternative C: Ringo Hills 16-inch Pipeline Alignment; Alternative D1: Lincoln Street Route Variation; etc.). Each alternative will be easily identifiable by reading the brief title. Provide a description of each alternative. The description of each alternative will discuss to what extent it would be potentially feasible,		

[20] Reduced footprint alternatives; siting alternatives; renewable, energy conservation, energy efficiency, demand response, distributed energy resources, and energy storage alternatives; and non-wires alternatives (electric projects only) are typically required. For linear projects, route alternatives and route variations are typically required as well.

meet the project's underlying purpose, meet most of the basic project objectives, and avoid or reduce one or more potentially significant impacts. If the Applicant believes that an alternative is infeasible or the implementation is remote and speculative (CEQA Guidelines Section 15126.6(f)(3), clearly explain why. If significant environmental effects are possible without mitigation, alternatives will be provided in the PEA that are capable of avoiding or reducing any potentially significant environmental effects, even if the alternative(s) substantially impede the attainment of some project objectives or are costlier.[21]		
4.2 No Project Alternative. Include a thorough description of the No Project Alternative. The No Project Alternative needs to describe the range of actions that are reasonably foreseeable if the proposed project is not approved. The No Project Alternative will be described to meet the requirements of CEQA Guidelines Section15126.6(e).		
4.3 Rejected Alternatives. Provide a detailed discussion of all alternatives considered by the Applicant that were not selected by the Applicant for a full description in the PEA and analysis in PEA Chapter 5. The detailed discussion will include the following: a) Description of the alternative and its components b) Map of any alternative sites or routes c) Discussion about the extent to which the alternative would meet the underlying purpose of the project and its basic objectives d) Discussion about the feasibility of implementing the alternative e) Discussion of whether the alternative would reduce or avoid any significant environmental impacts of the proposed project f) Discussion of any new significant impacts that could occur from implementation of the alternative g) Description of why the alternative was rejected h) Any comments from the public or agencies about the alternative during PEA preparation		
For Natural Gas Storage Projects:		
4.4 Natural Gas Storage Alternatives. In addition to the requirements included above, alternatives to be considered for proposed natural gas storage projects include the following, where applicable: a) Alternative reservoir locations considered for gas storage including other field locations and other potential storage areas b) Alternative pipelines, road, and utility siting c) Alternative suction gas requirements, and injection/withdrawal options		

[21] CPUC CEQA Unit Staff will determine whether an alternative could *substantially* reduce one or more potentially significant impacts of the proposed project (CEQA Guidelines Section 15125.5). Applicants are strongly advised to provide more rather than less alternatives for CPUC's consideration or as determined during Pre-filing.

5 Environmental Analysis

Include a description of the environmental setting, regulatory setting, and impact analysis for each resource area. The resource areas addressed will include each environmental factor (resource area) identified in the most recent adopted version of the CEQA Guidelines Appendix G checklist and any additional relevant resource areas and impact questions that are defined in this PEA checklist.

1. Environmental Setting
    a. For each resource area, the PEA will include a detailed description of the natural and built environment in the vicinity of the proposed project area (e.g., topography, land use patterns, biological environment, etc.) as applicable to the resource area. Both regional and local environmental setting information will be provided.
    b. All setting information provided will relate in some way to the impacts of the proposed project discussed in the PEA's impacts analysis, however CPUC's impacts analysis may be more thorough, which may necessitate additional setting information than the Applicant might otherwise provide.
2. Regulatory Setting
    a. Organized by federal, State, regional, and local sections
    b. Describe the policy or regulation and briefly explain why it is applicable to the proposed project.
        i. Identify in the setting all laws, regulations, and policies that would be applicable for CPUC's exclusive jurisdiction over the siting and design of electric and gas facilities. Public utilities under CPUC's jurisdiction are expected to consult with local agencies regarding land use matters. Local laws, regulations, and policies will be considered for the consideration of potential impacts during CPUC's CEQA review (e.g., encroachment, grading, erosion control, scenic corridors, overhead line undergrounding, tree removal, fire protection, permanent and temporary noise limits, zoning requirements, general plan polices, and all local and regional laws, regulations, and policies).
3. Impact Questions
    a. Includes all impact questions in the current version of CEQA Guidelines, Appendix G.
    b. Additional impact questions that are frequently relevant to utility projects are provided in Attachment 4, CPUC Draft Environmental Measures.
4. Impact Analyses
    a. Discussion organized by CEQA Guidelines, Appendix G impact items and any Additional CEQA Impact Questions in the PEA Checklist. Assess all potential environmental impacts and make determinations, such as, No Impact, Less than Significant, Less than Significant with Mitigation, Significant and Unavoidable, or Beneficial Impact with respect to construction, operations, and maintenance activities.
    b. The impact analyses provided in PEA Chapter 5, Environmental Analysis, need not be as thorough as those to be prepared by CPUC for the CEQA environmental document. A preliminary determination will be provided but with only brief justification unless otherwise directed by CPUC Staff in writing during Pre-filing.
5. CPUC Draft Environmental Measures
    a. CPUC Draft Environmental Measures are provided for some of the resource areas in Attachment 4, CPUC Draft Environmental Measures. The measures may be applied to the proposed project as written or modified by the CPUC during its environmental review if the measure would avoid or reduce a potentially significant impact.

b. The CPUC Draft Environmental Measures should be discussed with the CPUC's CEQA Unit Staff during Pre-filing, especially with respect to the development of Applicant Proposed Measures.
c. In general, impact avoidance is preferred to the reduction of potentially significant impacts.

Additional requirements specific to each resource area are identified in the following sections.

5.1 Aesthetics

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.1.1 Environmental Setting		
5.1.1.1: Landscape Setting. Briefly described the regional and local landscape setting.		
5.1.1.2: Scenic Resources. Identify and describe any vistas, scenic highways, national scenic areas, or other scenic resources within and surrounding the project area (approximately 5-mile buffer but may be greater if necessary). Scenic resources may also include but are not limited to historic structures, trees, or other resources that contribute to the scenic values where the project would be located.		
5.1.1.3: Viewshed Analysis a) Conduct a viewshed analysis for the project area (approximately 5-mile buffer but may be greater if necessary). b) Describe the project viewshed, including important visibility characteristics for the project site, such as viewing distance, viewing angle, and intervening topography, vegetation, or structures. c) Provide a supporting map (or maps) showing project area, landscape units, topography (i.e., hillshade), and the results of the viewshed analysis. Provide associated GIS data.		
5.1.1.4: Landscape Units. Identify and describe landscape units (geographic zones) within and surrounding the project area (approximately 5-mile buffer but may be greater if necessary) that categorizes different landscape types and visual characteristics, with consideration to topography, vegetation, and existing land uses. Landscape units should be developed based on the existing landscape characteristics rather than the project's features or segments.		
5.1.1.5: Viewers and Viewer Sensitivity. Identify and described the types of viewers expected within the viewshed and landscape units. Describe visual sensitivity to general visual change based on viewing conditions, use of the area, feedback from the public about the project, and landscape characteristics.		

5.1.1.6: Representative Viewpoints a) Identify representative viewpoints from publicly accessible locations (up to approximately 5-mile buffer but may be greater if appropriate). The number and location of the viewpoints must represent a range of views of the project site from major roads, highways, trails, parks, vistas, landmarks, and other scenic resources near the project site. Multiple viewpoints should be included where the project site would be visible from sensitive scenic resources to provide context on different viewing distances, perspectives, and directions. b) Provide the following information for each viewpoint: i. Number, title, and brief description of the location ii. Types of viewers iii. Viewing direction(s) and distance(s) to the nearest proposed project features iv. Description of the existing visual conditions and visibility of the project site as seen from the viewpoint and shown in the representative photographs c) Provide a supporting map (or maps) showing project features and representative viewpoints with arrows indicating the viewing direction(s). Provide associated GIS data (may be combined with GIS data request below for representative photographs).		
5.1.1.7: Representative Photographs a) Provide high resolution photographs taken from the representative viewpoints in the directions of all proposed project features.[22] Multiple photographs should be provided where project features may be visible in different viewing directions from the same location. b) Provide the following information for each photograph: i. Capture time and date ii. Camera body and lens model iii. Lens focal length and camera height when taken c) Provide GIS data associated with each photograph location that includes coordinates (<1 meter resolution), elevations, and viewing directions, as well as the associated viewpoint.		
5.1.1.8: Visual Resource Management Areas a) Identify any visual resource management areas within and surrounding the project area (approximately 5-mile buffer). b) Describe any project areas within visual resource management areas.		

[22] All representative photographs should be taken using a digital single-lens reflex camera with standard 50-millimeter lens equivalent, which represents an approximately 40-degree horizontal view angle. The precise photograph coordinates and elevations should be collected using a high accuracy GPS unit.

c) Provide a supporting map (or maps) showing project features and visual resource management areas. Provide associated GIS data.		
5.1.2 Regulatory Setting		
5.1.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding aesthetics and visual resource management.		
5.1.3 Impact Questions		
5.1.3.1: Impact Questions. The impact questions include all aesthetic impact questions in the current version of CEQA Guidelines, Appendix G. **5.1.3.2:** Additional CEQA Impact Questions: None.		
5.1.4 Impact Analysis		
5.1.4.1: Visual Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
The following information will be included in the PEA or a technical Appendix to support the aesthetic impact analysis:		
5.1.4.2: Analysis of Selected Viewpoints. Identify the methodology and assumptions that were applied in selecting key observation points for visual simulation. It is recommended that viewpoints are selected where viewers may be sensitive to visual change (public views) and in areas that are visually sensitive, or heavily trafficked or visited.[23]		
5.1.4.3: Visual Simulation a) Identify methodology and assumptions for completing the visual simulations. The simulations should include photorealistic 3-D models of project features and any land changes within the KOP view. The visual simulations should depict conditions: i. Immediately following construction, and ii. After vegetation establishment in all areas of temporary impact to illustrate the visual impact from vegetation removal. b) Provide high resolution images for the visual simulations.		
5.1.4.4: Analysis of Visual Change a) Identify the methodology and assumptions for completing the visual change analysis.[24] The methodology should be consistent with applicable visual resource management criteria. b) Provide a description of the visual change for each selected viewpoint. Describe any conditions that would change over time, such as vegetation growth.		

[23] The KOP selection process should be discussed with CPUC during Pre-filing
[24] The visual impact assessment methodology should be discussed with CPUC during Pre-filing

c) Describe the effects of visual change that would result in the entire project area, as indicated by the selected viewpoints that were simulated and analyzed.		
5.1.4.5: Lighting and Marking. Identify all new sources of permanent lighting. Identify any proposed structures or lines that could require FAA notification. Identify any structures or line segments that could require lighting and marking based on flight patterns and FAA or military requirements. Provide supporting documentation in an Appendix (e.g., FAA notice and criteria tool results).		
5.1.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.2 Agriculture and Forestry Resources

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.2.1 Environmental Setting		
5.2.1.1: Agricultural Resources and GIS a) Identify all agricultural resources that occur within the project area including: i. Areas designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance ii. Areas under Williamson Act contracts and provide information on the status of the Williamson Act contract iii. Any areas zoned for agricultural use in local plans iv. Areas subject to active agricultural use b) Provide GIS data for agricultural resources within the proposed project area.		
5.2.1.2: Forestry Resources and GIS a) Identify all forestry resources within the project area including: i. Forest land as defined in Public Resources Code 12220(g)25 ii. Timberland as defined in Public Resource Code section 4526 iii. Timberland zoned Timberland Production as defined in Government Code section 51104(g) b) Provide GIS data for all forestry resources within the proposed project area.		
5.2.2 Regulatory Setting		
5.2.2: Agriculture and Forestry Regulations. Identify all federal, state, and local policies for protection of agricultural and forestry resources that apply to the proposed project.		

[25] Forest land is defined in Public Resources Code as, "land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits."

5.2.3 Impact Questions		
5.2.3.1: Agriculture and Forestry Impact Questions. The impact questions include all agriculture and forestry impact questions in the current version of CEQA Guidelines, Appendix G. **5.2.3.2:** Additional CEQA Impact Questions: None.		
5.2.4 Impact Analyses		
5.2.4.1: Agriculture and Forestry Impacts. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
Incorporate the following discussions into the analysis of impacts:		
5.2.4.2: Prime Farmland Soil Impacts. Calculate the acreage of Prime Farmland soils that would be affected by construction and operation and maintenance.		
5.2.4.3. Williamson Act Impacts. Describe the approach to resolve potential conflicts with Williamson Act contract (if applicable)		
5.2.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.3 Air Quality

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.3.1 Environmental Setting		
5.3.1.1: Air Quality Plans Identify and describe all applicable air quality plans and attainment areas. Identify the air basin(s) for the project area. If the project is located in more than one attainment area and/or air basin, provide the extent in each attainment area and air basin.		
5.3.1.2: Air Quality. Describe existing air quality in the project area. a) Identify existing air quality exceedance of National Ambient Air Quality Standards and California Ambient Air Quality Standards in the air basin. b) Provide the number of days that air quality in the area exceeds state and federal air standards for each criteria pollutant that where air quality standards are exceeded. c) Provide air quality data from the nearest representative air monitoring station(s).		
5.3.1.3: Sensitive Receptor Locations. Identify the location and types of each sensitive receptor locations[26] within 1,000 feet of the project area. Provide GIS data for sensitive receptor locations.		

[26] Sensitive Receptor locations may include hospitals, schools, and day care centers, and such other locations as the air district board or California Air Resources Board may determine (California Health and Safety Code § 42705.5(a)(5)).

5.3.2 Regulatory Setting		
5.3.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding aesthetics and visual resource management.		
5.3.2.2: Air Permits. Identify and list all necessary air permits.		
5.3.3 Impact Questions		
5.3.3.1: Impact Questions. The impact questions include all air quality impact questions in the current version of CEQA Guidelines, Appendix G. **5.3.3.2:** Additional CEQA Impact Questions: None.		
5.3.4 Impact Analysis		
5.3.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
The following information will be presented in the PEA or a technical Appendix to support the air quality impact analysis:		
5.3.4.2: Air Quality Emissions Modeling. Model project emissions using the most recent version of CalEEMod and/or a current version of other applicable modeling program. Provide all model input and output data sheets in Microsoft Excel format to allow CPUC to evaluate whether project data was entered into the modeling program accurately. The assumptions used in the air quality modeling must be consistent with all PEA information about the project's schedule, workforce, and equipment. The following information will be addressed in the emissions modeling, Air Quality Appendix, and PEA: a) Quantify the expected emissions of criteria pollutants from all project-related sources. Quantify emissions for both construction and operation (e.g., compressor equipment). b) Identify manufacturer's specifications for all proposed new emission sources. For proposed new, additional, or modified compressor units, include the horsepower, type, and energy source. c) Describe any emission control systems that are included in the air quality analysis (e.g., installation of filters, use of EPA Tier II, III, or IV equipment, use of electric engines, etc.). d) When multiple air basins may be affected by the project, model air emissions within each air basin and provide a narrative (supported by calculations) that clearly describes the assumptions around the project activities considered for each air basin. Provide modeled emissions by attainment area or air basin (supported by calculations).		

5.3.4.3: Air Quality Emissions Summary. Provide a table summarizing the air quality emissions for the project and applicable thresholds for each applicable attainment area. Include a summary of uncontrolled emissions (prior to application of any APMs) and controlled emissions (after application of APMs). Clearly identify the assumptions that were applied in the controlled emissions estimates.		
5.3.4.4: Health Risk Assessment. Complete a Health Risk Assessment when air quality emissions have the potential to lead to human health impacts[27]. If health impacts are not anticipated from project emissions, the analysis should clearly describe why emissions would not lead to health impacts.		
5.3.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.4 Biological Resources

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.4.1 Environmental Setting		
5.4.1.1: Biological Resources Technical Report. Provide a Biological Resources Technical Report as an Appendix to the PEA that includes all information specified in Attachment 2.		
The following biological resources information will be presented in the PEA:		
5.4.1.2: Survey Area (Local Setting). Identify and describe the biological resources survey area as documented in the Biological Resources Technical Report. All temporary and permanent project areas must be within the survey area.		
5.4.1.3: Vegetation Communities and Land Cover a) Identify, describe, and quantify vegetation communities and land cover types within the biological resources survey area. b) Clearly identify any sensitive natural vegetation communities that meet the definition of a biological resource under CEQA (i.e., rare, designated, or otherwise protected), such as, but not limited to, riparian habitat. c) Provide a supporting map (or maps) showing project features and vegetation communities and land cover type.		

[27] Refer to Office of Environmental Health Hazard Assessment (OEHHA) most recent guidance for preparation of Health Risk Assessments to determine whether a Health Risk Assessment is required for the project. The need for an HRA should also be discussed with CPUC during Pre-filing.

5.4.1.4: Aquatic Features a) Identify, describe, and quantify aquatic features within the biological resources survey area that may provide potentially suitable aquatic habitat for rare and special-status species. b) Identify and quantify potentially jurisdictional aquatic features and delineated wetlands, according to the Wetland Delineation Report and Biological Resources Technical Report. c) Provide a supporting map (or maps) showing project features and aquatic resources.		
5.4.1.5: Habitat Assessment. Identify rare and special-status species with potential to occur in the project region (approximately a 5-mile buffer but may be larger if necessary). For each species, provide the following information: a) Common and scientific name b) Status and/or rank c) Habitat characteristics (i.e., vegetation communities, elevations, seasonal changes, etc.) d) Blooming characteristics for plants e) Breeding and other dispersal (range) behavior for wildlife f) Potential to occur within the survey area (i.e., Present, High Potential, Moderate Potential, Low Potential, or Not Expected), with justification based on the results of the records search, survey findings, and presence of potentially suitable habitat g) Specific types and locations of potentially suitable habitat that correspond to the vegetation communities and land cover and aquatic features		
5.4.1.6: Critical Habitat a) Identify and describe any critical habitat for rare or special-status species within and surrounding the project area (approximately a 5-mile buffer). b) Provide a supporting map (or maps) showing project features and critical habitat.		
5.4.1.7: Native Wildlife Corridors and Nursery Sites a) Identify and describe regional and local wildlife corridors within and surrounding the project area (approximately a 5-mile buffer), including but not limited to, landscape and aquatic features that connect suitable habitat in regions otherwise fragmented by terrain, changes in vegetation, or human development. b) Identify and describe regional and local native wildlife nursery sites within and surrounding the project area (approximately a 5-mile buffer), as identified through the records search, surveys, and habitat assessment.		

c) Provide a supporting map (or maps) showing project features, native wildlife corridors, and native nursery sites.		
5.4.1.8: Biological Resource Management Areas a) Identify any biological resource management areas (i.e., conservation or mitigation areas, HCP or NCCP boundaries, etc.) within and surrounding the project area (approximately 5-mile buffer). b) Identify and quantify any project areas within biological resource management areas. c) Provide a supporting map (or maps) showing project features and biological resource management areas.		
5.4.2 Regulatory Setting		
5.4.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding biological resources.		
5.4.2.2: Habitat Conservation Plan. Provide a copy of any relevant Habitat Conservation Plan.		
5.4.3 Impact Questions		
5.4.3.1: Impact Questions. The impact questions include all biological resource impact questions in the current version of CEQA Guidelines, Appendix G. **5.4.3.2:** Additional CEQA Impact Question: Would the project create a substantial collision or electrocution risk for birds or bats?		
5.4.4 Impact Analysis		
5.4.4.1: Impact Analysis Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for Biological Resources and any additional impact questions listed above.		
The following information will be included in the impact analysis:		
5.4.4.2: Quantify Habitat Impacts. Provide the area of impact in acres by each habitat type. Quantify temporary and permanent impacts. For all temporary impacts provide the following: a) Description of the restoration and revegetation approach b) Vegetation species that would be planted within the area of temporary disturbance c) Procedures to reduce invasive weed encroachment within areas of temporary disturbance d) Expected timeframe for restoration of the site		
5.4.4.3: Special-Status Species Impacts. Identify anticipated impacts on special-status species. Identify any take permits that are anticipated for the project. If an existing habitat conservation plan (HCP) or natural communities conservation plan (NCCP) would be used for the project, provide current accounting of take coverage included in the HCP/NCCP		

to demonstrate that there is sufficient habitat coverage remaining under the existing permit.		
5.4.4.4: Wetland Impacts. Quantify the area (in acres) of temporary and permanent impacts on wetlands. Include the following details: a) Provide a table identifying all wetlands, by milepost and length, crossed by the project and the total acreage of each wetland type that would be affected by construction. b) Discuss construction and restoration methods proposed for crossing wetlands. c) If wetlands would be filled or permanently lost, describe proposed measures to compensate for permanent wetland losses. d) If forested wetlands would be affected, describe proposed measures to restore forested wetlands following construction.		
5.4.4.5: Avian Impacts. Describe avian obstructions and risk of electrocution from the project. Describe any standards that will be implemented as part of the project to reduce the risk of collision and electrocution.		
5.4.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.5 Cultural Resources[28]

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.5.1 Environmental Setting		
5.5.1.1: Cultural Resource Reports. Provide a cultural resource inventory and evaluation report that addresses the technical requirement provided in Attachment 3.		
5.5.1.2: Cultural Resources Summary. Summarize cultural resource survey and inventory results and survey methods. Do not provide any confidential cultural resource information within the PEA chapter.		
5.5.1.3: Cultural Resource Survey Boundaries. Provide a map with mileposts showing the boundaries of all survey areas in the report. Provide the GIS data for the survey area. Provide confidential GIS data for the resource locations and boundaries separately under confidential cover.		
5.5.2 Regulatory Setting		
5.5.2.1: Regulatory Setting. Identify applicable federal and state regulations for protection of cultural resources.		

[28] For a description and evaluation of cultural resources specific to Tribes, see Section 5.18, Tribal Cultural Resources.

5.5.3 Impact Questions		
5.5.3.1: Impact Questions. The impact questions include all cultural resource impact questions in the current version of CEQA Guidelines, Appendix G. **5.5.3.2:** Additional CEQA Impact Questions: None.		
5.5.4 Impact Analysis		
5.5.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis		
5.5.4.2: Human Remains. Describe the potential for encountering human remains or grave goods during the trenching or any other phase of construction. Describe the procedures that would be used if human remains are encountered.		
5.5.4.3: Resource Avoidance. Describe avoidance procedures that would be implemented to avoid known resources.		
5.5.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.6 Energy

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.6.1 Environmental Setting		
5.6.1.1: Existing Energy Use. Identify energy use of existing infrastructure if the proposed project would replace or upgrade an existing facility.		
5.6.2 Regulatory Setting		
5.6.2.1: Regulatory Setting. Identify applicable federal, state, or local regulations or policies applicable to energy use for the proposed project.		
5.6.3 Impact Questions		
5.6.3.1: Impact Questions: The impact questions include all energy impact questions in the current version of CEQA Guidelines, Appendix G. **5.6.3.2:** Additional CEQA Impact Question: Would the project add capacity for the purpose of serving a non-renewable energy resource?		

5.6.4 Impact Analysis		
5.6.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.6.4.2: Nonrenewable Energy. Identify renewable and non-renewable energy projects that may interconnected to or be supplied by the proposed project.		
5.6.4.3: Fuels and Energy Use a) Provide an estimation of the amount of fuels (gasoline, diesel, helicopter fuel, etc.) that would be used during construction and operation and maintenance of the project. Fuel estimates should be consistent with Air Quality calculations supporting the PEA. b) Provide the following information on energy use: i. Total energy requirements of the project by fuel type and end use ii. Energy conservation equipment and design features iii. Identification of energy supplies that would serve the project		
5.6.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.7 Geology, Soils, and Paleontological Resources

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.7.1 Environmental Setting		
5.7.1.1: Regional and Local Geologic Setting. Briefly describe the regional and local physiography, topography, and geologic setting in the project area.		
5.7.1.2: Seismic Hazards a) Provide the following information on potential seismic hazards in the project area: i. Identify and describe regional and local seismic risk including any active faults within and surrounding the project area (will be a 10-mile buffer unless otherwise instructed in writing by CEQA Unit Staff during Pre-filing) ii. Identify any areas that are prone to seismic-induced landslides iii. Provide the liquefaction potential for the project area b) Provide a supporting map (or maps) showing project features and major faults, areas of landslide risk, and areas at high risk of liquefaction. Provide GIS data for all faults, landslides, and areas of high liquefaction potential.		

5.7.1.3: Geologic Units. Identify and describe the types of geologic units in the project area. Include the following information for each geologic unit: a) Summarize the geologic units within the project area. b) Identify any previous landslides in the area and any areas that are at risk of landslide. c) Identify any unstable geologic units. d) Provide a supporting map (or maps) showing project features and geologic units. Clearly identify any areas with potentially hazardous geologic conditions. Provide associated GIS data.		
5.7.1.4: Soils. Identify and describe the types of soils in the project area. a) Summarize the soils within the project area. b) Clearly identify any soils types that could be unstable (e.g., at risk of lateral spreading, subsidence, liquefaction, or collapse). c) Provide information on erosion susceptibility for each soil type that occurs in the project area. d) Provide a supporting map (or maps) showing project features and soils. Provide associated GIS data.		
5.7.1.5: Paleontological Report. Provide a paleontological report that includes the following: a) Information on any documented fossil collection localities within the project area and a 500-foot buffer. b) A paleontological resource sensitivity analysis based on published geological mapping and the resource sensitivity of each rock type. c) Supporting maps and GIS data.		
5.7.2 Regulatory Setting		
5.7.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding geology, soils, and paleontological resources.		
5.7.3 Impact Questions		
5.7.3.1: Impact Questions. The impact questions include all geology, soils, and paleontological resource impact questions in the current version of CEQA Guidelines, Appendix G. **5.7.3.2:** Additional CEQA Impact Questions: None.		
5.7.4 Impact Analysis		
5.7.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		

5.7.4.2: Geotechnical Requirements. Identify any geotechnical requirements that would be implemented to address effects from unstable geologic units or soils. Describe how the recommendation would be applied (i.e., when and where).		
5.7.4.3: Paleontological Resources. Identify the potential to disturb paleontological resources based on the depth of proposed excavation and paleontological sensitivity of geologic units within the project area.		
5.7.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.8 Greenhouse Gas Emissions

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.8.1 Environmental Setting		
5.8.1.1: GHG Setting. Provide a description of the setting for greenhouse gases (GHGs). The setting should consider any GHG emissions from existing infrastructure that would be upgraded or replaced by the proposed project.		
5.8.2 Regulatory Setting		
5.8.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for greenhouse gases.		
5.8.3 Impact Questions		
5.8.3.1 Impact Questions. The impact questions include all greenhouse gas impact questions in the current version of CEQA Guidelines, Appendix G. **5.8.3.2:** Additional CEQA Impact Questions: None.		
5.8.4 Impact Analysis		
5.8.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.8.4.2: GHG Emissions. Provide a quantitative assessment of GHG emissions for construction and operation and maintenance of the proposed project. Provide model results and all model files. Modeling will be conducted using the latest version of the emissions model at the time of application filing (e.g., most recent version of CalEEMod). GHG emissions will be provided for the following conditions: a) Uncontrolled emissions (before APMs are applied) b) Controlled emissions considering application of APMs i. Based on the modeled GHG emissions, quantify the project's contribution to and analyze the project's effect on		

climate change. Identify and provide justification for the timeframe considered in the analysis. ii. Discuss any programs already in place to reduce GHG emissions on a system-wide level. This includes the Applicant's voluntary compliance with the EPA SF6 reduction program, reductions from energy efficiency, demand response, LTPP, etc. iii. For any significant impacts, identify potential strategies that could be employed by the project to reduce GHGs during construction or operation and maintenance consistent with OPR Advisory on CEQA and Climate Change.		
Natural Gas Storage		
5.8.4.3: Natural Gas Storage Accident Conditions. In addition to the requirements above, identify the potential GHG emissions that could result in the event of a gas leak.		
5.8.4.4: Monitoring and Contingency Plan. Provide a comprehensive monitoring plan that would be implemented during project operation to monitor for gas leaks. The plan should identify a monitoring schedule, description of monitoring activities, and actions to be implemented if gas leaks are observed.		
5.8.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.9 Hazards, Hazardous Materials, and Public Safety[29]

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.9.1 Environmental Setting		
5.9.1.1: Hazardous Materials Report. Provide a Phase I Environmental Site Assessment or similar hazards report for the proposed project area. Describe any known hazardous materials locations within the project area and the status of the site.		
5.9.1.2: Airport Land Use Plan. Identify any airport land use plan(s) within the project area.		
5.9.1.3: Fire Hazard. Identify if the project occurs within federal, state, or local fire responsibility areas and identify the fire hazard severity rating for all project areas, including temporary work areas and access roads.		
5.9.1.4: Metallic Objects. For electrical projects, identify any metallic pipelines or cables within 25 feet of the project.		

[29] For fire risk specific to state responsibility areas or lands classified as very high fire hazard severity zones, see Section 5.20, Wildfire.

5.9.1.5: Pipeline History (for Natural Gas Projects). Provide a narrative describing the history of the pipeline system(s) to which the project would connect, list of previous owner and operators, and detailed summary of the pipeline systems' safety and inspection history.		
5.9.2 Regulatory Setting		
5.9.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for hazards, hazardous materials, and public safety.		
5.9.2.2: Touch Thresholds. Identify applicable standards for protection of workers and the public from shock hazards.		
5.9.3 Impact Questions		
5.9.3.1: Impact Questions. The impact questions include all hazards and hazardous materials impact questions in the current version of CEQA Guidelines, Appendix G. **5.9.3.2:** Additional CEQA Impact Questions: a) Would the project create a significant hazard to air traffic from the installation of new power lines and structures? b) Would the project create a significant hazard to the public or environment through the transport of heavy materials using helicopters? c) Would the project expose people to a significant risk of injury or death involving unexploded ordnance? d) Would the project expose workers or the public to excessive shock hazards?		
5.9.4 Impact Analysis		
5.9.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.9.4.2: Hazardous Materials. Identify the hazardous materials (i.e., chemicals, solvents, lubricants, and fuels) that would be used during construction and operation of the project. Estimate the quantity of each hazardous material that would be stored on site during construction and operation.		
5.9.4.3: Air Traffic Hazards. If the project involves construction of above-ground structures (including structure replacement) within the airport land use plan area, provide a discussion of how the project would or would not conflict with height restrictions identified in the airport land use plan and how the project would comply with any FAA or military requirements for the above ground facilities.		
5.9.4.4: Accident or Upset Conditions. Describe how the project facilities would be designed, constructed, operated, and maintained to		

minimize potential hazard to the public from the failure of project components as a result of accidents or natural catastrophes.		
5.9.4.5: Shock Hazard. For electricity projects, identify infrastructure that may be susceptible to induced current from the proposed project. Describe strategies (e.g., cathodic protection) that the project would employ to reduce shock hazards and avoid electrocution of workers or the public.		
For Natural Gas and Gas Storage:		
5.9.4.6: Health and Safety Plan. Include in the Health and Safety Plan, plans for addressing gas leaks, fires, etc. Identify sensitive receptors, methods of evacuation, and protection measures. The Plan will be provided as an Appendix to the PEA.		
5.9.4.7: Health Risk Assessment. Provide a Health Risk Assessment including risk from potential gas leaks, fires, etc. Identify sensitive receptors that would be affected and potential impacts on them if there is a gas release.[30]		
5.9.4.8: Gas Migration. Describe potential for and effects of gas migration through natural and manmade pathways. a) Provide Applicant Proposed Measures for avoiding gas emissions at the surface from gas migration pathways. b) Provide Applicant Proposed Measures for avoiding emissions of mercaptan and/or other odorizing agents.		
5.9.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.10 Hydrology and Water Quality

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.10.1 Environmental Setting		
5.10.1.1: Waterbodies. Identify by milepost all ephemeral, intermittent, and perennial surface waterbodies crossed by the project. For each, list its water quality classification, if applicable.		
5.10.1.2: Water Quality. Identify any downstream waters that are on the state 303(d) list and identify whether a total maximum daily load (TMDL) has been adopted or the date for adoption of a TMDL. Identify existing sources of impairment for downstream waters. Describe any management plans that are in place for downstream waters.		
5.10.1.3: Groundwater Basin. Identify all known EPA and state groundwater basins and aquifers crossed by the project.		

[30] Refer to the requirements for Health Risk Assessments in Section 5.3.4.4.

5.10.1.4: Groundwater Wells and Springs. Identify the locations of all known public and private groundwater supply wells and springs within 150 feet of the project area.		
5.10.1.5: Groundwater Management. Identify the groundwater management status of any groundwater resources in the project area and any groundwater resources that may be used by the project. Describe if groundwater resources in the basin have been adjudicated. Identify any sustainable groundwater management plan that has been adopted for groundwater resources in the project area or describe the status of groundwater management planning in the area.		
5.10.2 Regulatory Setting		
5.10.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding hydrologic and water quality.		
5.10.3 Impact Questions		
5.10.3.1: Impact Questions. The impact questions include all hydrology and water quality impact questions in the current version of CEQA Guidelines, Appendix G. **5.10.3.2:** Additional CEQA Impact Questions: None.		
5.10.4 Impact Analysis		
5.10.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in the current version of CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.10.4.2: Hydrostatic Testing. Identify all potential sources of hydrostatic test water, quantity of water required, withdrawal methods, treatment of discharge, and any waste products generated.		
5.10.4.3: Water Quality Impacts. Describe impacts to surface water quality, including the potential for accelerated soil erosion, downstream sedimentation, and reduced surface water quality.		
5.10.4.4: Impermeable Surfaces. Describe increased run-off and impacts on groundwater recharge due to construction of impermeable surfaces. Provide the acreage of new impermeable surfaces that will be created as a result of the project.		
5.10.4.5: Waterbody Crossings. Identify by milepost all waterbody crossings. Provide the following information for crossing: a) Identify whether the waterbody has contaminated waters or sediments. b) Describe the waterbody crossing method and any approaches to avoid the waterbody. c) Describe typical additional work area and staging area requirements at waterbody and wetland crossings.		

d) Describe any dewatering or water diversion that will be required during construction near the waterbody. Identify treatment methods for any dewatering. e) Describe any proposed restoration methods for work near or within the waterbody.		
5.10.4.6: Groundwater Impacts. If water would be obtained from groundwater supplies, evaluate the project's consistency with any applicable sustainable groundwater management plan.		
5.10.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.11 Land Use and Planning

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.11.1 Environmental Setting		
5.11.1.1: Land Use. Provide a description of land uses within the area traversed by the project route as designated in the local General Plan (e.g., residential, commercial, agricultural, open space, etc.).		
5.11.1.2: Special Land Uses. Identify by milepost and segment all special land uses within the project area including: a) All land administered by federal, state, or local agencies, or private conservation organizations b) Any designated coastal zone management areas c) Any designated or proposed candidate National or State Wild and Scenic Rivers crossed by the project d) Any national landmarks		
5.11.1.3: Habitat Conservation Plan. Provide a copy of any Habitat Conservation Plan applicable to the project area or proposed project. Also required for Section 5.4, Biological Resources.		
5.11.2 Regulatory Setting		
5.11.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for land use and planning.		
5.11.3 Impact Questions		
5.11.3.1: Impact Questions. The impact questions include all land use questions in the current version of CEQA Guidelines, Appendix G. **5.11.3.2:** Additional CEQA Impact Questions: None.		
5.11.4 Impact Analysis		
5.11.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		

5.11.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.12 Mineral Resources

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.12.1 Environmental Setting		
5.12.1.1: Mineral Resources. Provide information on the following mineral resources within 0.5 mile of the proposed project area: a) Known mineral resources b) Active mining claims c) Active mines d) Resource recovery sites		
5.12.2 Regulatory Setting		
5.12.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for minerals.		
5.12.3 Impact Questions		
5.12.3.1: Impact Questions. The impact questions include all mineral resource impact questions in the current version of CEQA Guidelines, Appendix G. **5.12.3.2:** Additional CEQA Impact Questions: None.		
5.12.4 Impact Analysis		
5.12.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
5.12.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.13 Noise

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.13.1 Environmental Setting		
5.13.1.1: Noise Sensitive Land Uses. Identify all noise sensitive land uses within 1,000 feet of the proposed project. Provide GIS data for sensitive receptors within 1,000 feet of the project.		
5.13.1.2: Noise Setting. Provide the existing noise levels (Lmax, Lmin, Leq, and Ldn sound level and other applicable noise parameters) at noise sensitive areas near the proposed project. All noise measurement data and the methodology for collecting the data will be provided in a noise study as an Appendix to the PEA.		

5.13.2 Regulatory Setting		
5.13.2.1: Regulatory Setting. Identify applicable state, and local laws, policies, and standards for noise.		
5.13.3 Impact Questions		
5.13.3.1 Impact Questions. The impact questions include all noise questions in the current version of CEQA Guidelines, Appendix G. **5.13.3.2:** Additional CEQA Impact Questions: None.		
5.13.4 Impact Analysis		
5.13.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.13.4.2: Noise Levels a) Identify noise levels for each piece of equipment that could be used during construction. b) Provide a table that identifies each phase of construction, the equipment used in each construction phase, and the length of each phase at any single location (see example in Table 7 below). c) Estimate cumulative equipment noise levels for each phase of construction. d) Include phases of operation if noise levels during operation have the potential to frequently exceed pre-project existing conditions. e) Identify manufacturer's specifications for equipment and describe approaches to reduce impacts from noise.		

Table 7. Construction Noise Levels

Equipment Required	Equipment Noise Levels (Leq; 50 feet)	Phase Noise Level (Leq; 50 feet)	Phase Duration at Each Location	Receptor Nearest to Construction Phase	Noise Level at Nearest Receptor (Leq)	Exceeds Noise Standard at Nearest Receptor?	Distance to Not Exceed Standard
Site Preparation/Grading							
Dozer	78 dBA	82 dBA	5 days	Residence on Main Street; 100 feet from Substation Site	76 dBA	Yes	112 feet
Gradall	79 dBA						
Dump Truck	73 dBA						
Construct Tower Foundation							
Auger Rig	77 dBA	82 dBA	11 days	School on Education Avenue; 130 feet from Tower A12	73 dBA	No	N/A
Dump Truck	73 dBA						
Excavator	77 dBA						
Concrete Truck	75 dBA						

For Natural Gas:		
5.13.4.3: Compressor Station Noise. Provide site plans of compressor stations or other noisy, permanent equipment, showing the location of the nearest noise sensitive areas within 1 mile of the proposed ROW. If new compressor station sites are proposed, measure or estimate the existing ambient sound environment based on current land uses and		

activities. For existing compressor stations (operated at full load), include the results of a sound level survey at the site property line and nearby noise-sensitive areas. Include a plot plan that identifies the locations and duration of noise measurements.		
5.13.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.14 Population and Housing

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.14.1 Environmental Setting		
5.14.1.1: Population Estimates. Identify population trends for the areas (county, city, town, census designated place) where the project would take place.		
5.14.1.2: Housing Estimates. Identify housing estimates and projections in areas where the project would take place.		
5.14.1.3: Approved Housing Developments a) Provide the following information for all housing development projects within 1 mile of the proposed project that have been recently approved or may be approved around the PEA and application filing date: i. Project name ii. Location iii. Number of units and estimated population increase iv. Approval date and construction status v. Contact information for developer (provided in the public outreach Appendix) b) Ensure that the project information provided above is consistent with the PEA analysis of cumulative project impacts.		
5.14.2 Regulatory Setting		
5.14.2.1: Regulatory Setting. Identify any applicable federal, state or local laws or regulations that apply to the project.		
5.14.3 Impact Questions		
5.14.3.1: Impact Questions. The impact questions include all population and housing impact questions in the current version of CEQA Guidelines, Appendix G. **5.14.3.2:** Additional CEQA Impact Questions: None.		
5.14.4 Impact Analysis		
5.14.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		

Include the following information in the impact analysis:		
5.14.4.2: Impacts to Housing. Identify if any existing or proposed homes occur within the footprint of any proposed project elements or right-of-way. Describe housing impacts (e.g., demolition and relocation of residents) that may occur as a result of the proposed project.		
5.14.4.3: Workforce Impacts. Describe on-site manpower requirements, including the number of construction personnel who currently reside within the impact area, who would commute daily to the site from outside the impact area or would relocate temporarily within the impact area. Chapter 4 of this document can be referenced as applicable. Identify any permanent employment opportunities that would be create by the project and the workforce conditions in the area that the jobs would be created.		
5.14.4.4: Population Growth Inducing. Provide information on the project's growth inducing impacts, if any. The information will include, but is not necessarily limited to, the following: a) Any economic or population growth in the surrounding environment that will directly or indirectly result from the project b) Any obstacles to population growth that the project would remove c) Any other activities directly or indirectly encouraged or facilitated by the project that would cause population growth leading to a significant effect on the environment, either individually or cumulatively		
5.14.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.15 Public Services

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.15.1 Environmental Setting		
5.15.1.1 Service Providers a) Identify the following service providers that serve the project area and provide a map showing the service facilities that could serve the project: i. Police ii. Fire (identify service providers within local and state responsibility areas) iii. Schools iv. Parks v. Hospitals		

b) Provide the documented performance objectives and data on existing emergency response times for service providers in the area (e.g., police or fire department response times).		
5.15.2 Regulatory Setting		
5.15.2.1 Regulatory Setting. Identify any applicable federal, state or local laws or regulations for public services that apply to the project.		
5.15.3 Impact Questions		
5.15.3.1: Impact Questions. The impact questions include all public services impact questions in the current version of CEQA Guidelines, Appendix G. **5.15.3.2:** Additional CEQA Impact Questions: None.		
5.15.4 Impact Analysis		
5.15.4.1 Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.15.4.2: Emergency Response Times a) Describe whether the project would impede ingress and egress of emergency vehicles during construction and operation. b) Include an analysis of impacts on emergency response times during project construction and operation, including impacts during any temporary road closures. Describe approaches to address impacts on emergency response times.		
5.15.4.3: Displaced Population. If the project would create permanent employment or displace people, evaluate the impact of the new employment or relocated people on governmental facilities and services and describe plans to reduce the impact on public services.		
5.15.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.16 Recreation

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.16.1 Environmental Setting		
5.16.1.1: Recreational Setting a) Describe the regional and local recreation setting in the project area including: i. Any recreational facilities or areas within and surrounding the project area (approximately 0.5-mile buffer) including the recreational uses of each facility or area		

ii. Any available data on use of the recreational facilities including volume of use b) Provide a map (or maps) showing project features and recreational facilities and provide associated GIS data.		
5.16.2 Regulatory Setting		
5.16.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding recreation.		
5.16.3 Impact Questions		
5.16.3.1: Impact Questions. The impact questions include all recreation impact questions in the current version of CEQA Guidelines, Appendix G. **5.16.3.2:** Additional CEQA Impact Questions: a) Would the project reduce or prevent access to a designated recreation facility or area? b) Would the project substantially change the character of a recreational area by reducing the scenic, biological, cultural, geologic, or other important characteristics that contribute to the value of recreational facilities or areas? c) Would the project damage recreational trails or facilities?		
5.16.4 Impact Analysis		
5.16.4.1: Impact Analysis: Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
5.16.4.2: Impact Details. Clearly identify the maximum extent of each impact, and when and where the impacts would or would not occur. Organize the impact assessment by project phase, project component, and/or geographic area, as necessary.		
5.16.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.17 Transportation

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.17.1 Environmental Setting		
5.17.1.1: Circulation System. Briefly describe the regional and local circulation system in the project area, including modes of transportation, types of roadways, and other facilities that contribute to the circulation system.		
5.17.1.2: Existing Roadways and Circulation a) Identify and describe existing roadways that may be used to access the project site and transport materials during		

construction or are otherwise adjacent to or crossed by linear project features. Provide the following information for each road: i. Name of the road ii. Jurisdiction or ownership (i.e., State, County, City, private, etc.) iii. Number of lanes in both directions of travel iv. Existing traffic volume (if publicly available data is unavailable or significantly outdated, then it may be necessary to collect existing traffic counts for road segments where large volumes of construction traffic would be routed or where lane or road closures would occur) v. Closest project feature name and distance b) Provide a supporting map (or maps) showing project features and the existing roadway network identifying each road described above. Provide associated GIS data. The GIS data should include all connected road segments within at least 5 miles of the project.		
5.17.1.3: Transit and Rail Services a) Identify and describe transit and rail service providers in the region. b) Identify any rail or transit lines within 1,000 feet of the project area. c) Identify specific transit stops, and stations within 0.5 mile of the project. Provide the frequency of transit service. d) Provide a supporting map (or maps) showing project features and transit and rail services within 0.5 mile of the project area. Provide associated GIS data.		
5.17.1.4: Bicycle Facilities a) Identify and describe any bicycle plans for the region. b) Identify specific bicycle facilities within 1,000 feet of the project area. c) Provide a supporting map (or maps) showing project features and bicycle facilities. Provide associated GIS data.		
5.17.1.5: Pedestrian Facilities a) Identify and describe important pedestrian facilities near the project area that contribute to the circulation system, such as important walkways. b) Identify specific pedestrian facilities that would be near the project, including on the road segments identified per 5.17.1.2. c) Provide a supporting map (or maps) showing project features and important pedestrian facilities. Provide associated GIS data.		

5.17.1.6: Vehicle Miles Traveled (VMT). Provide the average VMT for the county(s) where the project is located.		
5.17.2 Regulatory Setting		
5.17.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding transportation.		
5.17.3 Impact Questions		
5.17.3.1: Impact Questions. All impact questions for this resource area in the current version of CEQA Guidelines, Appendix G. **5.17.3.2:** Additional CEQA Impact Questions: a) Would the project create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations? b) Would the project interfere with walking or bicycling accessibility? c) Would the project substantially delay public transit?		
5.17.4 Impact Analysis		
5.17.4.1: Impact Analysis. Provide an impact analysis for each significance criteria identified in Appendix G of the CEQA Guidelines for transportation and any additional impact questions listed above[31].		
Include the following information in the impact analysis:		
5.17.4.2: Vehicle Miles Traveled (VMT) a) Identify whether the project is within 0.5 mile of a major transit stop or a high-quality transit corridor. b) Identify the number of vehicle daily trips that would be generated by the project during construction and operation by light duty (e.g., worker vehicles) and heavy-duty vehicles (e.g., trucks). Provide the frequency of trip generation during operation. c) Quantify VMT generation for both project construction and operation. d) Provide an excel file with the VMT assumptions and model calculations, including all formulas and values. e) Evaluate the project VMT relative to the average VMT for the area in which the project is located.		
5.17.4.3: Traffic Impact Analysis. Provide a traffic impact study. The traffic impact study should be prepared in accordance with guidance from the relevant local jurisdiction or Caltrans, where appropriate.		
5.17.4.4: Hazards. Identify any traffic hazards that could result from construction and operation of the project. Identify any lane closures and traffic management that would be required to construct the project.		

[31] Discuss with CPUC during Pre-filing whether a traffic study is needed.

5.17.4.5: Accessibility. Identify any closures of bicycle lanes, pedestrian walkways, or transit stops during construction or operation of the project.		
5.17.4.6: Transit Delay. Identify any transit lines that could be delayed by construction and operation of the project. Provide the maximum extent of the delay in minutes and the duration of the delay.		
5.17.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.18 Tribal Cultural Resources[32]

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.18.1 Environmental Setting		
5.18.1.1: Outreach to Tribes. Provide a list of all tribes that are on the Native American Heritage Commission (NAHC) list of tribes that are affiliated with the project area. Provide a discussion of outreach to Native American tribes, including tribes notified, responses received from tribes, and information of potential tribal cultural resources provided by tribes. Any information of potential locations of tribal cultural resources should be submitted in an Appendix under clearly marked confidential cover. Provide copies of all correspondence with tribes in an Appendix.		
5.18.1.2: Tribal Cultural Resources. Describe tribal cultural resources (TCRs) that are within the project area. a) Summarize the results of attempts to identify possible TCRs using publicly available documentary resources. The identification of TCRs using documentary sources should include review of archaeological site records and should begin during the preparation of the records search report (see Attachment 3). During the inventory phase, a formal site record would be prepared for any resource identified unless tribes object. b) Summarize attempts to identify TCRs by speaking directly with tribal representatives.		
5.18.1.3: Ethnographic Study. The ethnographic study should document the history of Native American use of the area and oral history of the area.		
5.18.2 Regulatory Setting		
5.18.2.1: Regulatory Setting. Identify any applicable federal, state or local laws or regulations for tribal cultural resources that apply to the project.		

[32] For a description of historical resources and requirements for cultural resources that are not tribal cultural resources, refer to Section 5.5 Cultural Resources.

5.18.3 Impact Questions		
5.18.3.1: Impact Questions. The impact questions include all tribal cultural resources impact questions in the current version of CEQA Guidelines, Appendix G. **5.18.3.2:** Additional CEQA Impact Questions: None.		
5.18.4 Impact Analysis		
5.18.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.18.4.2: Information Provided by Tribes. Include an analysis of any impacts that were identified by the tribes during the Applicant's outreach.		
5.18.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.19 Utilities and Service Systems

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.19.1 Environmental Setting		
5.19.1.1: Utility Providers. Identify existing utility providers and the associated infrastructure that serves the project area.		
5.19.1.2: Utility Lines. Describe existing utility infrastructure (e.g., water, gas, sewer, electrical, stormwater, telecommunications, etc.) that occurs in the project ROW. Provide GIS data and/or as-built engineering drawings to support the description of existing utilities and their locations.		
5.19.1.3: Approved Utility Projects. Identify utility projects that have been approved for construction within the project ROW but that have not yet been constructed.[33]		
5.19.1.4: Water Supplies. Identify water suppliers and the water source (e.g., aqueduct, well, recycled water, etc.). For each potential water supplier, provide data on the existing water capacity, supply, and demand.		
5.19.1.5: Landfills and Recycling. Identify local landfills that can accept construction waste and may service the project. Provide documentation of landfill capacity and estimated closure date. Identify any recycling centers in the area and opportunities for construction and demolition waste recycling.		

[33] Note that this project information should be consistent with the cumulative project description included in Chapter 7.

5.19.2 Regulatory Setting		
5.19.2.1: Regulatory Setting. Identify any applicable federal, state or local laws or regulations for utilities that apply to the project.		
5.19.3 Impact Questions		
5.19.3.1: Impact Questions. All impact questions for this resource area in the current version of CEQA Guidelines, Appendix G. **5.19.3.2:** Additional CEQA Impact Question: Would the project increase the rate of corrosion of adjacent utility lines as a result of alternating current impacts?		
5.19.4 Impact Analysis		
5.19.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.19.4.2: Utility Relocation. Identify any project conflicts with existing utility lines. If the project may require relocation of existing utilities, identify potential relocation areas and analyze the impacts of relocating the utilities. Provide a map showing the relocated utility lines and GIS data for all relocations.		
5.19.4.3: Waste a) Identify the waste generated by construction, operation, and demolition of the project. b) Describe how treated wood poles would be disposed of after removal, if applicable. c) Provide estimates for the total amount of waste materials to be generated by waste type and how much of it would be disposed of, reused, or recycled.		
5.19.4.4: Water Supply a) Estimate the amount of water required for project construction and operation. Provide the potential water supply source(s). b) Evaluate the ability of the water supplier to meet the project demand under a multiple dry year scenario. c) Provide a discussion as to whether the proposed project meets the criteria for consideration as a project subject to Water Supply Assessment Requirements under Water Code Section 10912. d) If determined to be necessary under Water Code Section 10912, submit a Water Supply Assessment to support conclusions that the proposed water source can meet the project's anticipated water demand, even in multiple dry year scenarios. Water Supply Assessments should be approved by		

the water supplier and consider normal, single-dry, and multiple-dry year conditions.		
5.19.4.5: Cathodic Protection. Analyze the potential for existing utilities to experience corrosion due to proximity to the proposed project. Identify cathodic protection measures that could be implemented to reduce corrosion issues and where the measures may be applied.		
5.19.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.20 Wildfire

This section will include, but is not limited to, the following:	**PEA Section and Page Number**	**Applicant Notes, Comments**
5.20.1 Environmental Setting		
5.20.1.1: High Fire Risk Areas and State Responsibility Areas a) Identify areas of high fire risk or State Responsibility Areas (SRAs) within the project area. Provide GIS data for the Wildland Urban Interface (WUI) and Fire Hazard Severity Zones (FHSZ) mapping along the project alignment. Include areas mapped by CPUC as moderate and high fire threat districts as well as areas mapped by CalFire. b) Identify any areas the utility has independently identified as High FHSZ known to occur within the proposed project vicinity.		
5.20.1.2: Fire Occurrence. Identify all recent (within the last 10 years) large fires that have occurred within the project vicinity. For each fire, identify the following: a) Name of the fire b) Location of fire c) Ignition source and location of ignition d) Amount of land burned e) Boundary of fire area in GIS		
5.20.1.3: Fire Risk. Provide the following information for assessment of baseline fire risk in the area: a) Provide fuel modeling using Scott Burgan fuel models, or other model of similar quality. b) Provide values of wind direction and speed, relative humidity, and temperature for representative weather stations along the alignment for the previous 10 years, gathered hourly. c) Digital elevation models for the topography in the project region showing the relationship between terrain and wind patterns, as well as localized topography to show the effects of terrain on wind flow, and on a more local area to show effect of slope on fire spread.		

d) Describe vegetation fuels within the project vicinity and provide data in map format for the project vicinity. USDA Fire Effects Information System or similar data source should be consulted to determine high-risk vegetation types. Provide the mapped vegetation fuels data in GIS format.		
5.20.1.4: Values at Risk. Identify values at risk along the proposed alignment. Values at risk may include: Structures, improvements, rare habitat, other values at risk, (including utility-owned infrastructure) within 1000 feet of the project. Provide some indication as to its vulnerability (wood structures vs. all steel features). Communities and/or populations near the project should be identified with their proximity to the project defined.		
5.20.1.5: Evacuation Routes. Identify all evacuation routes that are adjacent to or within the project area. Identify any roads that lack a secondary point of access or exit (e.g., cul-de-sacs).		
5.20.2 Regulatory Setting		
5.20.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for wildfire.		
5.20.2.2: CPUC Standards. Identify any CPUC standards that apply to wildfire management of the new facilities.		
5.20.3 Impact Questions		
5.20.3.1: Impact Questions. All impact questions for this resource area in the current version of CEQA Guidelines, Appendix G. **5.20.3.2:** Additional CEQA Impact Questions: None.		
5.20.4 Impact Analysis		
5.20.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.20.4.2: Fire Behavior Modeling. For any new electrical lines, provide modeling to support the analysis of wildfire risk.		
5.20.4.3: Wildfire Management. Describe approaches that would be implemented during operation and maintenance to manage wildfire risk in the area. Provide a copy of any Wildfire Management Plan.		
5.20.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.21 Mandatory Findings of Significance[34]

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.21.1: Impact Assessment for Mandatory Findings of Significance. Provide an impact analysis for each of the mandatory findings of significance provided in Appendix G of the CEQA Guidelines. The impact analysis can reference relevant information and conclusion from the biological resources, cultural resources, air quality, hazards, and cumulative sections of the PEA, where applicable.		

6 Comparison of Alternatives

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
6.1: Alternatives Comparison a) Compare the ability of each alternative described in Chapter 4 against the proposed project in terms of its ability to avoid or reduce a potentially significant impact. The alternatives addressed in this section will each be: i. Potentially feasible ii. Meet the underlying purpose of the proposed project iii. Meet most of the basic project objectives, and iv. Avoid or reduce one or more potentially significant impacts. b) The relative effect of the various potentially significant impacts may be compared using the following or similar descriptors and an accompanying analysis: i. Short-term versus long-term impacts ii. Localized versus widespread impacts iii. Ability to fully mitigate impacts c) Impacts that the Applicant believes would be less than significant with mitigation may also be included in the analysis, but only if the steps listed above fail to distinguish among the remaining few alternatives.		
6.2: Alternatives Ranking. Provide a detailed table that summarizes the Applicant's comparison results and ranks the alternatives in order of environmental superiority.[35]		

[34] PEAs need only include a Mandatory Findings of Significance section if CPUC CEQA Unit Staff determine that a Mitigated Negative Declaration may be the appropriate type of document to prepare for the project, as determined through Pre-filing consultation. If no such determination has been made, then a Mandatory Findings of Significance section and the requirements below are not required.

[35] If the proposed project does not rank #1 on the list, the Applicant should provide the rationale for selecting the proposed project.

7 Cumulative and Other CEQA Considerations

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
7.1 Cumulative Impacts		
7.1.1: List of Cumulative Projects a) Provide a detailed table listing past, present, and reasonably foreseeable future projects within and surrounding the project area (approximately 2-mile buffer)[36]. The following information should be provided for each project in the table: i. Project name and type ii. Brief description of the project location(s) and associated actions iii. Distance to and name of the nearest project component iv. Project status and anticipated construction schedule v. Source of the project information and date last checked (for each individual project), including links to any public websites where the information was obtained so it can be reviewed and updated (the project information should be current when the PEA is filed) b) Provide a supporting map (or maps) showing project features and cumulative project locations and/or linear features. Provide associated GIS data.		
7.1.2: Geographic Scope. Define the geographic scope of analysis for each resource topic. The geographic scope of analysis for each resource topic should consider the extent to which impacts can be cumulative. For example, the geographic scope for cumulative noise impacts would be more limited in scale than the geographic scope for biological resource impacts because noise attenuates rapidly with distance. Explain why the geographic scope is appropriate for each resource.		
7.1.3: Cumulative Impact Analysis. Provide an analysis of cumulative impacts for each resource topic included in Chapter 5. Evaluate whether the proposed project impacts are cumulatively considerable[37] for any significant cumulative impacts.		
7.2 Growth-Inducing Impacts		
7.2.1: Growth-Inducing Impacts. Provide an evaluation of the following potential growth-inducing impacts:		

[36] Information on cumulative projects may be obtained from federal, state, and local agencies with jurisdiction over planning, transportation, and/or resource management in the area. Other projects the Applicant is involved in or aware of in the area should be included.

[37] "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

a) Would the proposed project foster any economic or population growth, either directly or indirectly, in the surrounding environment? b) Would the proposed project cause any increase in population that could further tax existing community service facilities (i.e., schools, hospitals, fire, police, etc.)? c) Would the proposed project remove any obstacles to population growth? d) Would the proposed project encourage and facilitate other activities that would cause population growth that could significantly affect the environment, either individually or cumulatively?		

8 List of Preparers

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
8.1: List of Preparers. Provide a list of persons, their organizations, and their qualifications for all authors and reviewers of each section of the PEA.		

9 References

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
9.1: Reference List a) Organize all references cited in the PEA by section within a single chapter called "References." b) Within the References chapter, organize all of the Chapter 5 references under subheadings for each resource area section.		
9.2: Electronic References a) Provide complete electronic copies of all references cited in the PEA that cannot be readily obtained for free on the Internet. This includes any company-specific documentation (e.g., standards, policies, and other documents). b) If the reference can be obtained on the Internet, the Internet address will be provided.		

PEA Checklist Attachments

Attachment 1: GIS Data Requirements

This Attachment includes specific requirements and format of GIS data that is intended to be applicable to all PEAs. The specific GIS data requirements may be updated on a project-specific basis during Pre-filing coordination with CPUC's CEQA Unit Staff.

1. GIS data will be provided in an appropriate format (i.e., point, line, polygon, raster) and scale to adequately verify assumptions in the PEA and supporting materials and determine the level of environmental impacts. At a minimum, all GIS data layers will include the following metadata properties:
    a. The source (e.g., report reference), date, title, and preparer (name or company)
    b. Description of the contents and any limitations of the data
    c. Reference scale and accuracy of the data
    d. Complete attributes that correspond to the detailed mapbook, project description, and figures presented in the PEA and/or supporting application materials, including unique IDs, labels, geometry, and other appropriate project details
2. Where precise boundaries of project features may change (e.g., staging areas and temporary construction work areas), the Applicant will provide GIS data layers with representative boundaries to evaluate potential environmental impacts as a worst-case scenario.
3. Provide GIS data for:
    a. All proposed and alternative project facilities including but not limited to existing and proposed/alternative ROWs; substations and switching stations; pole/tower locations; conduit; vaults, pipelines; valves; compressor stations; metering stations; valve stations, gas wellheads; other project buildings, facilities, and components (both temporary and permanent); telecommunication and distribution lines modifications or upgrades related to the project; marker ball and lighting locations; and mileposts, facility perimeters, and other demarcations or segments as applicable
    b. All proposed areas required for construction and construction planning, including all proposed and alternative disturbance areas (both permanent and temporary); access roads; geotechnical work areas; extra work areas (e.g., staging areas, parking areas, lay-down areas, work areas at and around specific pole/tower sites, pull and tension sites, helicopter landing areas); airport landing areas; underground installation areas (e.g. trenches, vaults, underground work areas); horizontal directional drilling, jack and bore, or tunnel areas; blasting areas; and any areas where special construction methods may need to be employed
    c. Within the PEA checklist there are also specific requirements for environmental resources within Chapter 5. All environmental resource GIS data must meet the minimum mapping standards specified in this Attachment.

Attachment 2: Biological Resource Technical Report Standards

Definitions

The following biological resources will be considered within the scope of the PEA and the Biological Resources Technical Report:

Sensitive Vegetation Communities and Habitats

a) Sensitive vegetation communities/habitats identified in local or regional plans, policies, or regulations, or designated by CDFW38 or USFWS
b) Areas that provide habitat for locally unique biotic species/communities (e.g., oak woodlands, grasslands, and forests)
c) Habitat that contains or supports rare, endangered, or threatened wildlife or plant species as defined by CDFW and USFWS
d) Habitat that supports CDFW Species of Special Concern
e) Areas that provide habitat for rare or endangered species and that meet the definition in CEQA Guidelines Section 15380
f) Existing game and wildlife refuges and reserves
g) Lakes, wetlands, estuaries, lagoons, streams, and rivers
h) Riparian corridors

Special-Status Species

a) Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (ESA) (50 CFR § 17.12 [listed plants], 17.11 [listed animals] and various notices in the Federal Register [proposed species])
b) Species that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR § 40, February 28, 1996)
c) Species listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 CCR § 670.5)
d) Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.)
e) Species that meet the definitions of rare and endangered under CEQA. CEQA Guidelines Section 15380 provides that a plant or animal species may be treated as "rare or endangered" even if not on one of the official lists.
f) Plants considered by the California Native Plant Society (CNPS) to be "rare, threatened or endangered in California" (California Rare Plant Rank 1A, 1B, 2A, and 2B) as well as California Rare Plant Rank 3 and 4 plant species
g) Species designated by CDFW as Fully Protected or as a Species of Special Concern
h) Species protected under the Federal Bald and Golden Eagle Protection Act
i) Birds of Conservation Concern or Watch List species
j) Bats considered by the Western Bat Working Group to be "high" or "medium" priority (Western Bat Working Group 2015)

[38] CDFW's Rarity Ranking follows NatureServe's Heritage Methodology (Faber-Langendoen, et al. 2016) in which communities are given a G (global) and S (state) rank based on their degree of imperilment (as measured by rarity, trends, and threats). Communities with a Rarity Ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) are considered sensitive by CDFW.

Biological Resource Technical Report Minimum Requirements

Report Contents

The Biological Resource Technical Report will include the following information at a minimum.

a) **Preliminary Agency Consultation.** Describe any pre-survey contact with agencies. Describe any agency approvals that were required for biologists or agency protocols that were applied to the survey effort. Provide copies of correspondence and meeting notes with the names and contact information for agency staff and the dates of consultation as an appendix to the Biological Resources Technical Report.
b) **Records Search.** Provide the results of all database and literature searches for biological resources within and surrounding the project area. Identify all sources reviewed (e.g., CNDDB, CNPS, USFWS, etc.).
c) **Biological Resource Survey Method.** Identify agency survey requirements and protocols applicable to each biological survey that was conducted. Identify the areas where each survey occurred. Identify any limitations for the surveys (e.g., survey timing or climatic conditions) that could affect the survey results.
d) **Vegetation Communities and Land Cover.** Identify all vegetation communities or land cover types (e.g., disturbed or developed) within the biological survey area. The biological survey area should include a 1,000-foot buffer from project facilities to support CPUC's evaluation of indirect effects.
e) **Aquatic Resources.** Identify any wetlands, streams, lakes, reservoirs, estuarine, or other aquatic resources within the biological survey area. Provide a wetland delineation and all data sheets including National Wetlands Inventory maps (or the appropriate state wetland maps, if National Wetlands Inventory maps are not available) that show all proposed facilities and include milepost locations for proposed pipeline routes. Provide a copy of agency verification of the wetland delineation if the delineation has been verified by the U.S. Army Corps of Engineers or CDFW. If the delineation has not been verified, describe the process and timing for obtaining agency verification.
f) **Habitat Assessments.** Evaluate the potential for suitable habitat in the biological survey area for each species identified in the database and literature search.
g) **Native Wildlife Corridors and Nursery Sites.** Identify any wildlife corridors or nursery sites that occur within the biological survey area.
h) **Survey Results.** Describe all survey results and include a copy of any focused (e.g., rare plant, protocol special-status wildlife) biological resources survey reports.

Mapping and GIS Data

Provide detailed maps (at approximately 1:3,000 scale or similar), and all associated GIS data for the Biological Resources Technical Report and any supporting biological survey reports, including:

a) Biological survey area for each survey that was conducted
b) Vegetation communities and land cover types
c) Aquatic resource delineation
d) Special-status plant locations
e) Special-status wildlife locations
f) Avian point count locations
g) Critical habitat
h) California Coastal Commission or Bay Conservation and Development Commission jurisdictional areas

Attachment 3: Cultural Resource Technical Report Standards

Cultural Resource Inventory Report

Provide a cultural resource inventory report that includes archaeological, unique archaeological, and built-environment resources within all areas that could be affected by the proposed project including areas of indirect effect. The inventory report will include the results of both a literature search and pedestrian survey. The contents will address the requirements in *Archaeological Resource Management Reports: Recommended Contents and Guidelines*. The methodology and results of the inventory should be sufficient to provide the reader with an understanding of the nature, character, and composition of newly discovered and previously identified cultural resources so that the required recommendations about the resource(s) CRHR eligibility are clearly understood. No information regarding the location of the cultural resources will be included in these descriptions. The required Department of Parks and Recreation (DPR) 523 forms, including location information and photographs of the resources, are to be included in a removable confidential appendix to the report.[39]

The inventory report will meet the following requirements:

a) The report should clearly discuss the methods used to identify unique archaeological resources (e.g., how the determination was made about the resources' eligibility).
b) The report should identify large resources such as districts and landscapes where resources indicate their presence, even if federal agencies disagree. It is understood that often only a few contributing elements may be in the project area, and that the boundaries of the large resource may need to be revisited as part of future projects. It is acknowledged that boundaries of districts and landscapes can be difficult to define and there is not always good recorded data on these resources.
c) In the case of archaeological resources, the report should discuss whether each one is also a unique archaeological resource and explain why or why not.
d) Descriptions of resources should include spatial relationships to other nearby resources, raw materials sources, and natural features such as water sources and mountains.
e) The evidence that indicates a particular function or age for a resource should be explicitly described with a clear explanation, not simply asserted.

Cultural Resource Evaluation Report

Provide a cultural resource evaluation report. The report contents required by the state of California are outlined in the *Archaeological Resource Management Reports: Recommended Contents and Guidelines*. The evaluation report should also include:

a) Resource descriptions and evaluations together, and not in separate volumes or report sections. This will facilitate understanding of each resource.
b) An evaluation of each potential or eligible California Register of Historical Resources (CRHR) resource within the public archaeology laboratory (PAL) for all seven aspects of integrity[40] using specific examples for each resource. This evaluation needs to be included in the evaluation

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39 Any aspect of the PEA and associated data that Applicants believe to be confidential will be provided in full but may be marked confidential if allowed pursuant to General Order 66 or latest applicable Commission rule (e.g., see Public Records Act Proceeding R.14-11-001).

40 The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association, as defined in "***Types of Historical Resources and Criteria for Listing in the California Register of Historical Resources***" [14 CCR 4852(c)]).

report for all resources that could be affected by the project even if the resources were not previously evaluated. Previous evaluations should be reviewed to address change over time.

c) An evaluation of each potential or eligible CRHR resource within the PAL under all four criteria using specific examples for each resource. This evaluation needs to be included in the evaluation report for all resources that could be affected by the project even if the resources were not previously evaluated. The cultural resources professional should make their own recommendation regarding eligibility, which does not need to agree with previous recommendations for CRHR or NRHP, as long as it is clearly explained.
d) For **prehistoric archaeological resources**, Criteria 1, 2 and 3[41] should be explicitly considered. Research efforts to search for important events and persons related to the resource must be described. This evaluation needs to be included in the evaluation report for all resources that could be affected by the project even if the resources were not previously evaluated. The cultural resources professional should make their own recommendation, which does not need to agree with previous recommendations for CRHR or NRHP eligibility, as long as it is clearly explained.
e) While **potential unique archaeological resources** could be identified in the records search report or inventory report, the justification for each individual resource to be considered a resource under CEQA should be presented in this report.
f) If surface information collected during survey is sufficient to make an eligibility recommendation, this reasoning should be outlined explicitly for each resource. This is particularly the case for resources that are believed to have buried subsurface components.
g) If archaeological testing or additional historical research was required in order to evaluate a resource, the evaluation report will be explicit about why the work was required, the results for each resource, and the subsequent eligibility recommendation.
h) For large projects with multiple similar resources where the eligibility justifications for similar resources are essentially identical, it is acceptable to discuss these resources as a group. However, eligibility justifications for each individual resource is preferred, so if the grouping strategy is used, the criteria used to group resources must be clearly justified.
i) Large resources such as districts and landscapes may be challenging to fully evaluate in the context of a single project. CPUC encourages the identification and evaluation of these resources with the understanding that often only a few contributing elements may be located within the project area, and that the boundaries of the large resource may need to be revisited as part of future projects. It is understood that a full evaluation of the resource may be beyond the scope of one project. Regardless, the potential for the project to affect any resources within a district or landscape must be defined.

[41] Criteria for Designation on the California Register are as follows (defined in http://ohp.parks.ca.gov/?page_id=21238):

- Criterion 1: Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- Criterion 2: Associated with the lives of persons important to local, California or national history.
- Criterion 3: Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values.
- Criterion 4: Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Attachment 4: CPUC Draft Environmental Measures

About this Attachment: The following CPUC Draft Environmental Measures are provided for consideration during PEA development. They should be discussed with the CPUC's CEQA Unit Staff during Pre-filing, especially with respect to the development of Applicant Proposed Measures. The CPUC Draft Environmental Measures may form the basis for mitigation measures in the CEQA document if appropriate to the analysis of potentially significant impacts. These and other CPUC Draft Environmental Measures may be formally incorporated into Chapter 5 of future versions of the PEA Checklist.

5.1 Aesthetics

Aesthetics Impact Reduction During Construction

All project sites will be maintained in a clean and orderly state. Construction staging areas will be sited away from public view where possible. Nighttime lighting will be directed away from residential areas and have shields to prevent light spillover effects. Upon completion of project construction, project staging and temporary work areas will be returned to pre-project conditions, including re-grading of the site and re-vegetation or re-paving of disturbed areas to match pre-existing contours and conditions.

5.3 Air Quality

Dust Control During Construction

The Applicant shall implement measures to control fugitive dust in compliance with all local air district(s) standards. Dust control measures shall include the following at a minimum:

- All exposed surfaces with the potential of dust-generating shall be watered or covered with coarse rock to reduce the potential for airborne dust from leaving the site.
- The simultaneous occurrence of more than two ground disturbing construction phases on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- Cover all haul trucks entering/leaving the site and trim their loads as necessary.
- Use wet power vacuum street sweepers to sweep all paved access road, parking areas, staging areas, and public roads adjacent to project sites on a daily basis (at minimum) during construction. The use of dry power sweeping is prohibited.
- All trucks and equipment, including their tires, shall be washed off prior to leaving project sites.
- Apply gravel or non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at project sites.
- Water and/or cover soil stockpiles daily.
- Vegetative ground cover shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- All vehicle speeds shall be limited to fifteen (15) miles per hour or less on unpaved areas.
- Implement dust monitoring in compliance with the standards of the local air district.
- Halt construction during any periods when wind speeds are in excess of 50 mph.

5.5 Cultural Resources

Human Remains (Construction and Maintenance)

Avoidance and protection of inadvertent discoveries that contain human remains shall be the preferred protection strategy with complete avoidance of such resources ensured by redesigning the project. If human remains are discovered during construction or maintenance activities, all work shall be diverted from the area of the discovery, and the CPUC shall be informed immediately. The Applicant shall contact the County Coroner to determine whether or not the remains are Native American. If the remains are determined to be Native American, the Coroner will contact the Native American Heritage Commission (NAHC). The NAHC will then identify the person or persons it believes to be the most likely descendant of the deceased Native American, who in turn would make recommendations for the appropriate means of treating the human remains and any associated funerary objects.

If the remains are on federal land, the remains shall be treated in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA). If the remains are not on federal land, the remains shall be treated in accordance with Health and Safety Code Section 7050.5, CEQA Section 15064.5(e), and Public Resources Code Section 5097.98.

5.8 Greenhouse Gas Emissions

Greenhouse Gas Emissions Reduction During Construction

The following measures shall be implemented to minimize greenhouse gas emissions from all construction sites:

- If suitable park-and-ride facilities are available in the project vicinity, construction workers shall be encouraged to carpool to the job site.
- The Applicant shall develop a carpool program to the job site.
- On road and off-road vehicle tire pressures shall be maintained to manufacturer specifications. Tires shall be checked and re-inflated at regular intervals.
- Demolition debris shall be recycled for reuse to the extent feasible.
- The contractor shall use line power instead of diesel generators at all construction sites where line power is available.
- The contractor shall maintain construction equipment per manufacturing specifications.

5.19 Utilities and Service Systems

Notify Utilities with Facilities Above and Below Ground

The Applicant shall notify all utility companies with utilities located within or crossing the project ROW to locate and mark existing underground utilities along the entire length of the project at least 14 days prior to construction. No subsurface work shall be conducted that would conflict with (i.e., directly impact or compromise the integrity of) a buried utility. In the event of a conflict, areas of subsurface excavation or pole installation shall be realigned vertically and/or horizontally, as appropriate, to avoid other utilities and provide adequate operational and safety buffering. In instances where separation between third-party utilities and underground excavations is less than 5 feet, the Applicant shall submit the intended construction methodology to the owner of the third-party utility for review and approval at least 30 days prior to construction. Construction methods shall be adjusted as necessary to assure that the integrity of existing utility lines is not compromised.

5.20 Wildfire

Construction Fire Prevention Plan

A project-specific Construction Fire Prevention Plan for both construction and operation of the project shall be submitted for review prior to initiation of construction. A draft copy of the Plan shall be provided to the CPUC and state and local fire agencies at least 90 days before the start of any construction activities in areas designated as Very High or High Fire Hazard Severity Zones. Plan reviewers shall also include

federal, state, or local agencies with jurisdiction over areas where the project is located. The final Plan shall be approved by the CPUC at least 30 days prior to the initiation of construction activities. The Plan shall be fully implemented throughout the construction period and include the following at a minimum:

- The purpose and applicability of the Plan
- Responsibilities and duties
- Preparedness training and drills
- Procedures for fire reporting, response, and prevention that include:
    - Identification of daily site-specific risk conditions
    - The tools and equipment needed on vehicles and to be on hand at sites
    - Reiteration of fire prevention and safety considerations during tailboard meetings
    - Daily monitoring of the red-flag warning system with appropriate restrictions on types and levels of permissible activity
- Coordination procedures with federal and local fire officials
- Crew training, including fire safety practices and restrictions
- Method(s) for verifying that all Plan protocols and requirements are being followed

A project Fire Marshal or similar qualified position shall be established to enforce all provisions of the Construction Fire Prevention Plan as well as perform other duties related to fire detection, prevention, and suppression for the project. Construction activities shall be monitored to ensure implementation and effectiveness of the Plan.

Fire Prevention Practices (Construction and Maintenance)

The Applicant shall implement ongoing fire patrols during the fire season as defined each year by local, state, and federal fire agencies. These dates vary from year to year, generally occurring from late spring through dry winter periods. During Red Flag Warning events, as issued daily by the National Weather Service, all construction/maintenance activities shall cease, with an exception for transmission line testing, repairs, unfinished work, or other specific activities which may be allowed if the facility/equipment poses a greater fire risk if left in its current state.

All construction/maintenance crews and inspectors shall be provided with radio and cellular telephone access that is operational in all work areas and access routes to allow for immediate reporting of fires. Communication pathways and equipment shall be tested and confirmed operational each day prior to initiating construction/maintenance activities at each work site. All fires shall be reported to the fire agencies with jurisdiction in the area immediately upon discovery of the ignition.

All construction/maintenance personnel shall be trained in fire-safe actions, initial attack firefighting, and fire reporting. All construction/maintenance personnel shall be trained and equipped to extinguish small fires in order to prevent them from growing into more serious threats. All construction/maintenance personnel shall carry at all times a laminated card and be provided a hard hat sticker that list pertinent telephone numbers for reporting fires and defining immediate steps to take if a fire starts. Information on laminated contact cards and hard hat stickers shall be updated and redistributed to all construction/maintenance personnel and outdated cards and hard hat stickers shall be destroyed prior to the initiation of construction/maintenance activities on the day the information change goes into effect.

Construction/maintenance personnel shall have fire suppression equipment on all construction vehicles. Construction/maintenance personnel shall be required to park vehicles away from dry vegetation. Water tanks and/or water trucks shall be sited or available at active project sites for fire protection during construction. The Applicant shall coordinate with applicable local fire departments prior to construction/maintenance activities to determine the appropriate amounts of fire equipment to be carried on vehicles and, should a fire occur, to coordinate fire suppression activities.

CHAPTER 7 - CRITICAL FACILITIES MAPPING

A. CRITICAL FACILITIES CHARACTERISTICS AND PERFORMANCE
B. PREPARATION AND USE OF CRITICAL FACILITIES MAPS
C. COMBINING CRITICAL FACILITIES MAPS AND MULTIPLE HAZARD MAPS
REFERENCES

Summary

This chapter presents guidelines for the preparation of critical facilities maps, giving examples of such maps, and explaining how they can be analyzed together with multiple hazard maps to assess vulnerability and to select appropriate hazard reduction techniques.

The general goal of any national, regional, or community development program should be to promote the health, safety, and prosperity of the people. Certain public and private facilities are crucial to this goal, which cannot be achieved if they are destroyed, damaged, or their services interrupted. A more specific goal, then, should be that of protecting these facilities from hazardous natural phenomena.

The importance of giving attention in development planning studies to critical facilities and the risks to them from natural hazards is described in Chapter 1. The vulnerability of new critical facilities needed to support development can be reduced by avoiding hazardous areas, designing for resistance, or operating with minimal exposure. Strategies for existing critical facilities include relocation, strengthening, retrofitting, adding redundancy, revising operations, and adopting emergency preparedness, response, and recovery programs.

Mapping critical facilities, comparing or combining that information with a multiple hazard map (MHM: see Chapter 6), and integrating both into project preparation improve decisions during the different stages of the development planning process. The use of the maps ranges from location decisions to criteria for developing construction standards.

A. CRITICAL FACILITIES CHARACTERISTICS AND PERFORMANCE

1. Definitions
2. Characteristics of Critical Facilities
3. Damage Scenarios

Throughout this primer a natural event causing loss of life and destruction of social and economic environments beyond the control of the affected population is considered a disaster. Large numbers of victims and economic losses are experienced every year as a consequence of natural events. For example, the Mexican earthquake of September 1985, which affected Mexico City and seven states, killed over 10,000 people and caused damage estimated at over US$4 billion. These figures, without precedent in the earthquake history of Mexico, represent a single instance of how natural events affect areas having numerous production facilities and infrastructure.

This section defines man-made structures that can be considered critical in an emergency due to natural events, and describes a technique to estimate the expected behavior of critical facilities in case of such events.

1. Definitions

The term "critical facilities" in this chapter is used to include all man-made structures or other improvements which because of their function, size, service area, or uniqueness have the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if they are destroyed, damaged, or if their services are repeatedly interrupted.

The definition used is an expanded version of that proposed by the U.S. Office of Science and Technology Policy (1978). In terms of the development planning process it is important to ensure that the key elements described in the box below are included when considering critical facilities within project planning.

Terms such as "lifelines," "urban lifelines," and "emergency infrastructure" are used in post-disaster damage studies, emergency preparedness planning, and socioeconomic impact evaluations. They usually refer to two particular categories: transportation and utilities. These two categories are of particular importance to (1) locating and serving new economic activities, (2) supporting existing economic activities, (3) providing the connections to, and support of, emergency facilities, (4) contributing to any disaster preparedness, response, recovery, and reconstruction activity, and (5) receiving a high priority for strengthening before a disaster, for emergency operations, and for rerouting or rapid repair after damage or interruption. The term "lifelines" has been variously defined as:

- Systems vital to the support of any community (Earthquake Engineering Research Institute, 1977).

- Facilities which are required to transport people, things, energy, and information, necessary "for a community in a modern industrial society to survive and prosper," and "indispensable... to other facilities and services that are critical in a disaster setting such as hospitals, fire fighting, and emergency operation centers" (Schiff, 1984).

- (1) Those water, sewage, transportation, and communications facilities necessary for the survival of a community, (2) those systems that provide essential services to a community, (3) those services that are important in our daily lives and that, if interrupted, could cause widespread social and economic inconvenience or loss, and (4) geographically spread networks on which society is dependent (Taylor et al, 1982).

- Critical segments or components (for production facilities, infrastructure networks, and support systems to settlements) which should be recognized as priority elements for rehabilitation following a disaster (Bender, 1987).

KEY CONSIDERATIONS WHEN IDENTIFYING CRITICAL FACILITIES WITHIN A DEVELOPMENT PLANNING PROCESS

- Unique or large structures whose failure might be catastrophic.
- Emergency facilities whose operation is crucial immediately before, during, or after a disaster.
- High-density occupancy structures whose failure would result in numerous deaths and injuries.
- Facilities required for public safety and security.

According to Taylor et al (1982), "fire, medical, food, banking, education, and industrial services might be included as lifelines," and what is important "is not a precise definition of lifeline systems so much as a coverage of those safety issues that are likely to be of great concern." For example, the term "vital community facilities" has been used by the U.S. Office of Science and Technology Policy (1978) to include hospitals, fire and police

departments, communication and administration centers, and major repair and storage facilities.

In this chapter all vital structures necessary for community health, safety and prosperity are considered critical facilities. Figure 7-1 provides an expanded listing of critical facilities beyond the traditional definition of lifeline systems.

2. Characteristics of Critical Facilities

When a natural or man-made event affects a critical facility, the impacts are dramatically multiplied when compared to the effects that a similar event may have on non-critical systems. Chapter 1 discusses the effects of an event on the built environment as dependent on the characteristics of the structures (location, design, materials used, and maintenance) and characteristics of the occupants (density, freedom of movement, and health during the event). The effects of hazardous events on critical facilities depend not only on such characteristics, but also on a number of other characteristics unique to a critical facility.

The secondary hazards created from critical facilities (collapse or failure of dams, toxic-chemical storage facilities, etc.), the disruption of certain services (medical, fire, police, etc.), and infrastructure disruption (electricity, damage to roads and highways, etc.) can all bring increased negative impact to the community above the importance of the critical facility itself.

The critical facilities discussed in this chapter can be destroyed, damaged, or interrupted by technological hazards which are beyond the scope of this chapter. Nevertheless, it is important to emphasize that the facilities discussed are "critical" regardless of their exposure to hazardous events because of their special function, size, service area, or uniqueness. These characteristics can be summarized in the box below.

Other vital national or regional economic activities or facilities besides those defined above vary with each governmental jurisdiction, its resources, and its needs, and should be included in the preparation of a CFM.

Different scenarios have been used to anticipate the behavior of critical facilities when a hazardous event occurs. The property losses to structures and their contents and the number of deaths and injuries of its occupants are estimated. Examples of the use of damage scenarios are given below.

Figure 7-1 - EXAMPLES OF CRITICAL FACILITIES THAT CAN BE ADVERSELY AFFECTED BY NATURAL HAZARDS

PUBLIC SAFETY AND SECURITY

Civil defense installations
Communications centers
Emergency management centers
Fire stations
Hospitals and other medical facilities
Mass emergency shelters
Police stations and other installations for public security

HIGH-DENSITY OCCUPANCY

Auditoriums, theatres, stadiums
Churches
Educational facilities
Hotels
Office buildings
Penal institutions

TRANSPORTATION

Airways-airports, heliports
Highways-bridges, tunnels, roadbeds, overpasses, transfer centers
Railways-trackage, tunnels, bridges, yards, depots
Waterways-canals, locks, seaports, ferries, harbors, drydocks, piers

UTILITIES

Communications-lines, stations, printing presses, relay points, antenna complexes

Electric power-water impoundments, fuel storage, generators, transmission lines, substations, switchyards

Petrochemical installations-production, transmission, storage, terminals

Potable water-collection, transmission, siphons, flumes, treatment, storage

Waste water-collection, treatment, discharge

INDUSTRIAL

Corrosives-manufacture, transfer, storage, disposal
Explosives-manufacture, transfer, storage, disposal
Flammable materials-manufacture, transfer, storage, disposal
Radioactive materials-manufacture, transfer, storage, disposal
Toxins-manufacture, transfer, storage, disposal

AGRICULTURAL

Food-storage, processing, transfer
Irrigation systems
Water containment-dams, reservoirs, levees, dikes, other impoundments

CHARACTERISTICS OF CRITICAL FACILITIES

- Extensive exposure in terms of their lineal character (e.g. railways and pipelines).

- Capacity or service areas affecting large numbers of people and vital national or regional socioeconomic activities (e.g., energy systems, irrigation systems, public offices, potable water installations).

- Large numbers of people exposed, requiring immediate and intensive use of skilled persons and limited resources during search and rescue operations (e.g., medical facilities).

- Size and continuous-use character, whose failure can cause secondary hazards over very large areas and an increase in the number of people affected (e.g., flooding because of dam failure, lost food production because of irrigation system damage, conflagrations because of chemical explosions).

- Sole supply to emergency facilities (e.g.. electricity) or sole access for repairs to other critical facilities (e.g., highways).

- Interconnections between other critical facilities, thereby aggravating damage and outages (e.g., pipelines and transmission lines). Remoteness which causes delays in repairs and increases in outage time (e.g., transmission lines, repeater stations).

- Vital for everyday emergencies, easily overloaded during a disaster, and no substitutes available if damaged (e.g., hospitals and emergency management centers).

- Operation necessary for effective response and recovery activities during and after an emergency (e.g., airports, power generators).

3. Damage Scenarios

A scenario is usually thought of as a synopsis or outline of what might happen; thus, a "damage scenario" can be considered a synopsis or outline of a hazardous event and its impacts on a region or community. The following scenarios and techniques have been designed to reflect a particular disaster setting in terms of earthquake hazard.

The designing of a scenario may assume a natural phenomenon that is hazardous and then estimate casualties, property damage, and failure of critical facilities (Figure 7-1). For example, property losses to buildings and their contents, deaths, injuries requiring hospitalization, and failure of critical facilities were estimated for seven postulated earthquakes by the (U.S.) Federal Emergency Management Agency (1980). In addition, the National Oceanic and Atmospheric Administration (Algermissen et al., 1973) researched earthquake losses, the U.S. Geological Survey (1981) presented detailed scenarios for the seven postulated earthquakes affecting major population centers in the State of California (U.S.), and Blume et al. (1978) predicted damage to structures.

Davis et al. (1982) show how a scenario can be used to assess the effects of a future earthquake on several critical facilities. Using an intensity map provided by the U.S. Geological Survey, the State of California Division of Mines and Geology prepared a planning scenario based on a repeat occurrence of the great Fort Tejon earthquake of January 9, 1857. The mapped information was based on the method described by Evernden et al. (1981) and was modified according to additional geologic information. The scenario assumed a magnitude 8.3 earthquake on the southern San Andreas fault.

Zones roughly paralleling the postulated surface rupture along the San Andreas fault were displayed as isoseismal areas (that is, areas within which the anticipated seismic intensities are comparable). Each zone was assigned an intensity rating based on the Rossi-Forel scale. Davis et al. (1982) then showed the distribution of seismic intensity values based on the following hypothetical chain of events: the specified earthquake occurs, various localities in the planning area experience a specific type of shaking or ground failure, and certain critical facilities undergo damage while others do not. An analysis of readiness was then used to provide planning insights, recommend further work, and serve as a basis for making or improving emergency preparedness, response, recovery, and reconstruction plans.

Figure 7-2 - CHARACTERISTICS OF INFORMATION SHOWN ON FIGURES 7-3 THROUGH 7-12

FIGURE NUMBER	SCALE (thousands)	COVERAGE a/	LOCATION AND INDEX OF QUANTITATIVE CHARACTERISTICS	LOCATION	CRITICAL FACILITY TYPE	CAPACITY	SERVICE AREA	NATURAL HAZARDS	COMPUTER-GENERATED MAPS
7-3	1,000	N	X		X				
7-4	400	R	X		X	X			
7-5	250	R		X	X		X	X	
7-6	200	R	X	X	X		X		
7-7	125	R	X		X			X	X
7-8	100	R	X	X	X	X		X	X
7-9	66	R		X	X			X	
7-10	50	R		X	X		X		
7-11	33	U		X	X			X	
7-12	24	U		X	X			X	

[a/] N = national, R = regional, U = urban settlement.

The University of California at Los Angeles (UCLA) Ad Hoc Joint Senate-Administration Earthquake Safety Committee (1985) report begins:

> A major earthquake on the San Andreas Fault or on one of the earthquake faults in the vicinity of UCLA could cause from 1,500 to 2,000 deaths on campus, if it were to occur during normal classroom/working hours. The number of serious injuries could be at least twice that number. The likelihood of occurrence of an earthquake of these dimensions within the next 20 years is considered to be high. These estimates take into account expert evaluations of the quality of construction and furnishings of classroom, dormitory, and office buildings as well as the libraries and auditoriums. This report proposes that a campus-wide program be initiated aimed at mitigation of a threat that poses a significant hazard to life as well as to property.

The report addresses vulnerability of the campus and includes performance ratings, priority, and structural evaluation of 27 buildings; nonstructural elements; overpasses and bridges; chemical, biological, and radiation spills; utilities and energy facilities; UCLA Medical Center; and Stone Canyon Dam.

Perkins (1987) used expected damage to selected building types as generalized from past earthquake experience. The building types included tilt-up concrete, concrete and steel frame, and wood frame buildings. This information was then used to create a damage potential map that combines several intensity maps. The cumulative damage factors ranged from "very low" to "extremely high" potential and were defined as the cost of repairing a building divided by the cost of replacing that building. Although these maps show damage for a particular type of structure, several critical facilities can be seen,

namely, major highways, railways, bridges, harbors, and airports (Figure 7-7). The identified expected damage factors may or may not apply to the critical facilities.

Additional attention can be brought to expected damage by preparing a comprehensive inventory of past hazardous events and the resulting damage; see Singer et al (1983) for geologic hazards in Venezuela. For each state, a glossary of past events was prepared which included codes for administrative unit (state), a map-locator code, the location of the event, and its date of occurrence. For each event, the nature of the event, its physical evidence, its relationship to seismic activity, type of material damage that occurred, and the number of victims were noted.

B. PREPARATION AND USE OF CRITICAL FACILITIES MAPS

1. Benefits of Critical Facilities Mapping
2. Preparing Critical Facilities Maps
3. Compiling Critical Facilities Information
4. Sources of Critical Facilities Information
5. Assessing the Vulnerability of Critical Facilities

Critical facilities maps (CFM) are a graphical reference which includes information on the location and characteristics of these vital systems. The impact of a natural event on critical facilities is sufficiently important that the mapping of such vital systems should be part of any development planning study. A CFM can be used to assess and reduce vulnerability especially when combined with a multiple hazard map. Such a process is extensively described in Section C.

The CFM discussed here is primarily for use in an integrated development planning study by the various working groups that execute the study prepared under this process. Reference is made in this section to ten examples (Figures 7-3 through 7-12). A summary of the characteristics of the information displayed on Figures 7-3 through 7-12 is shown in Figure 7-2.

Much of the information in Chapter 6, on multiple hazard maps, is applicable to critical facilities and is repeated or adapted in this section for the reader's convenience. Discussions on the benefits of critical facilities mapping, selection of base map, convenient scales and coverage, types of symbols to be used, facilities to be shown, accuracy, key elements, compilation, and sources of critical facility information follows.

1. Benefits of Critical Facilities Mapping

Maps are the most effective way to convey actual and relative location of critical facilities. A CFM is a prerequisite to addressing and reducing natural hazards that may affect new or existing critical facilities.

The primary purpose of a CFM is not just to convey to planners and decision-makers the location of a facility, but to show its capacity and service area in an accurate, clear, and convenient way. When using a CFM, an extensive number of critical facilities can be included and reviewed at the same time. Also, when combined with multiple hazard maps, they can provide information on which areas require more information, which ones require different reduction techniques, and which locations need immediate attention when a hazardous event occurs. The benefits of using a CFM are summarized in the box below.

Figure 7-3 - INFRASTRUCTURE AND EQUIPMENT MAP

Source: Adapted from OEA. Proyecto de Asistencia Técnica al Departamento de Planeamiento Regional de SEPLACOOI - República Oriental del Uruguay,

Mapa de Infraestructura/Equipamiento. (Washington, D.C.: Organization of American States, 1980).

BENEFITS IN USING CRITICAL FACILITIES MAPS

- A clear and convenient representation of critical facilities in the project area is provided.

- The land-use plans can be assessed prior to implementation.

- The impact of existing infrastructure on potential development can be assessed before project implementation.

- A more concise focus on different types, configuration, structural design, and use of critical facilities in the project area can be made.

- More realistic benefit-cost ratios for new development are possible.

- Lack of information (location, number, size or capacity, and service area) on critical facilities can be identified.

- Identification of a need for more (or better) investigations into the process or susceptibility of hazards is created.

- Facilities requiring emergency preparedness and immediate recovery or repair are identified.

2. Preparing Critical Facilities Maps

a. Base Maps
b. Information Display Techniques
c. Key Elements of Critical Facility Information

Maps are a planimetric reference which can be prepared to include critical facilities information in hazardous areas. These maps can be used to assess and reduce vulnerability, since they can postulate information on natural phenomena that is hazardous (location, likelihood, and severity) and estimate its effect on numerous critical facilities.

Identifying the various characteristics of critical facilities and understanding how natural events may impact these man-made structures can become a complex and time-consuming task. Weighing and accumulating the impacts may seem almost impossible. Various techniques for assessing critical facilities vulnerability are shown in Section C. However, simple guidance is required when planners and decision-makers prepare a CFM.

The following subsections describe the basic elements that should be considered when preparing a CFM.

a. Base Maps

A prerequisite to compiling critical facilities information onto a map is the selection or creation of a base map upon which to place this information. Such maps are usually identified during the preliminary mission; the team needs only to select a scale appropriate to the study area. Also, the base map used for an MHM (see Chapter 6) can be the same as that used for the CFM.

An adequate base map must (1) be planimetric, that is, a representation of information on a plane in true geographic relationship and with measurable horizontal distances; and (2) have sufficient geographic reference information to orient the user to the location of the facility to be shown. Figures 7-3 through 7-12 are all planimetric and each has sufficient reference information for its scale and areal coverage. For example, the map of Uruguay

from which Figure 7-3 is taken shows each city; other maps show highways and rivers; some even show the size and shape of large buildings (Figures 7-11 and 7-12).

If existing maps cannot be adopted for use as a base map, then one must be constructed. This process can be expensive, since an adequate planimetric representation containing different kinds of information can require trained staff and the use of special equipment and techniques.

Whenever possible, the planning team should adopt as a base map one of the many maps widely available. Chapter 6 provides many examples of the variety of maps that can be used as a base map. Several base maps at different scales may be considered, depending upon the final study area or areas and the predominating scale of the individual facilities maps. The most detailed facilities map may be selected as the base, if it provides adequate geographic orientation. Many maps are created with north at their top, but not all. Therefore, a north arrow must always be included.

Sometimes local agencies prepare a base map that displays information on various man-made improvements (Figures 7-11 and 7-12). For example, base maps at a scale of 1:2,500 to 1:10,000 can be obtained for many urban areas. The OAS Department of Regional Development and Environment and other development assistance agencies have prepared various inventory maps (Figures 7-3, 7-4, and 7-10).

Figure 7-4 - CONFIGURATION OF ELECTRICAL ENERGY NETWORK

Source: Adapted from OEA. Plan Hidráulico del Jubones. República del Ecuador, Vol. I, Mapa 4-1. (Washington, D.C.: Organization of American States, 1984).

These types of base maps, sometimes called "topographic" or "contour line" maps, are invaluable because many of the critical facilities are shown. Figures 7-11 and 7-12 are good examples of topographic maps which show critical facilities.

Cadastral maps are excellent base maps for CFM because of their scale and orientation information (see Chapter 6). Their characteristics, coverage, scale, accuracy, and cost are discussed in *Physical Resource Investigations for Economic Development* (Organization of American States, 1969).

b. Information Display Techniques

It must be emphasized that the information shown on the CFM is an important factor that the planner or decision-maker should consider when assessing vulnerability or the location of new development. Thus information included in the CFM must be clear, convenient, and not just accurate but perceived as accurate. The selection of an adequate scale and symbols and avoiding large amounts of information which can be difficult to analyze are important display techniques necessary to consider when preparing a CFM. Information on these aspects follows.

Scale and Coverage

Map scale is the measure of reduction in size from the actual environment to that portrayed on the map. Maps are smaller than the area mapped and therefore have a ratio between map distance and actual distance, for example, 1:200,000. This ratio means that one meter on the map represents 200,000 meters on the ground, or one millimeter represents 200 meters. Larger-scale maps usually provide information showing more detail and greater resolution; however, less areal coverage can be shown.

Many different scales are appropriate for the CFM. For example, the map from which Figure 7-3 is taken shows a nation at a scale of 1:1,000,000. However, larger scales (greater detail) are more common for regional development planning (1:500,000 through 1:50,000, Figures 7-4 through 7-10), and community development plans (1:50,000 through 1:24,000, Figures 7-11 and 7-12). Maps at a scale of 1:125,000 can represent a division

between presenting facility information in a symbolic way and fixing its location and areal size (compare Figures 7-6 and 7-7).

The scale selected will depend upon the map's purpose; there are no best scales, only more convenient ones (Figure 7-2). The box below lists what scales generally provide useful information for covering certain areas.

The scale used for a CFM is selected on the basis of the information on the facilities to be shown, but also may be dependent upon the scale of the base map. The area covered, scale, detail, facilities shown, and format of a CFM range widely, as shown in Figures 7-3 through 7-12. Sometimes the coverage is limited by the purpose of the map, jurisdiction of the map-maker, or enabling legislation. For example, an awareness of coastal hazards, disclosure of flood and fault rupture hazards, and regulation of fault rupture zones are illustrated by Figures 7-9, 7-11, and 7-12.

If a choice of scales is available, then the factors listed in the box on page 7-15 become important in making the selection.

Maps may be enlarged or reduced. In the case of a CFM, often various types of facilities are mapped at different scales. Also, when combining mapped information about different facilities, an enlargement or reduction to the scale of the base map may be required. Use of controlled photographic methods, or digital registration by computer, makes this process easier and more accurate.

Map titles and explanations are usually unaffected by enlargements or reductions, but not the verbal and numerical scales. Written scales (one millimeter equals one hundred meters) and numerical scales (1:1000,000) remain accurate only for the original map, a graphic scale should always be included.

USEFUL MAP SCALES

Area Covered	Map Scales
Nation	1:1,000,000-1:250,000
Region (or island countries)	1:500,000-1:50,000
Urban areas	1:50,000-1:2,500

Figure 7-5 MULTIPLE HAZARD MAP COMBINED WITH EMERGENCY FACILITIES

Source: Adapted from Santa Clara County Planning Department. Seismic Safety Plan. (San Jose, California: Santa Clara County Planning Department, 1975).

FACTORS TO CONSIDER WHEN CHOOSING APPROPRIATE MAP SCALES

- Number and type of facilities to be shown.
- Size or capacity of the facilities.
- Area to be covered.
- Size of final flat or folded sheets of the map

The map scale selected affects not only the size of the area and the amount of detail that can be shown, but also the location of the facility. For example, if a small scale map (1:1,000,000) using a 1/millimeter-wide line symbol is enlarged ten times (1:100,000), the line symbol becomes one centimeter wide. Similarly, reduction of point and line symbols may result in their de-emphasis or even disappearance.

Symbols

Everything shown on a CFM as well as the base map is a symbol representing reality. Innumerable variations of points, lines, and areas are available to the maker of a CFM. Point symbols can be shaded, patterned, colored, numbered, or lettered. Lines can be

solid, long-dashed, short-dashed, or paired, as conventionally used by cartographers in preparing topographic maps. Areas can be shaded, patterned, or colored (Figure 7-7).

Symbols are selected for easy reference and reproduction-examples include numbers (Figure 7-3), letters, conventions (Figures 7-10 and 7-11), computer printout (Figures 7-7 and 7-8), nonconventional symbols (Figure 7-10), and resemblance to real physical form (Figure 7-11). Conventional symbols used on topographic maps may show critical facilities; others indicate jurisdictional boundaries or provide orientation. Some symbols may convey a sense of the facilities; others are totally abstract (electric stations and lines in Figure 7-4). There are no best symbols, only more convenient ones.

The variety of symbols in a CFM is limited only by visual variables-location, shape, size, color, volume, pattern, and direction. The location, type, capacity, and service area of each facility should be given or, if unknown, clearly stated as such. The information provided in the box below presents an explanation of the use of symbols in a CFM.

It must be emphasized that all the facilities information shown on the CFM, as well as on the base map information, are symbols-some conventional, others abstract, and many innovative. Planners and decision-makers should be aware that the use and interpretation of symbols may be limited, since often they can be misleading. For example, filling up a CFM with the symbols from several individual facility maps may give the impression of a more thorough study, when, of course, this may be untrue. Simplified critical facilities maps only create an awareness of what information exists and, even more importantly, what information is missing. In this sense, the planning team should understand that a CFM cannot substitute for detailed studies and site-specific investigations.

Also, development planners or decision-makers may be tempted to misinterpret the symbols with the reality they represent. This erroneous practice can be very costly. For example, development planners or investors may want to locate critical facilities needed for economic development along a line that looks the straightest and most convenient on the map. Such a route may lie in a hazardous area. Examples of the misuse of maps by vertical and horizontal distortion, density of symbols, contrasting colors, scales, or the use of symbols and colors which have suggestive, connotative powers beyond their denotative role are discussed by Muehrcke (1978). Map limitation must be appreciated and, when necessary, further investigations should be undertaken.

A thorough discussion of graphic design is beyond the scope of both this chapter and the previous chapter on multiple hazard mapping (Chapter 6). However, the reader and map-maker will find an excellent discussion by Robinson et al. (1978) on a design process, relation to the arts, objectives, components, content, audiences, limitations, and graphic elements of maps.

Figure 7-6 - HUMAN SETTLEMENT AND INFRASTRUCTURE MAP

Source: Adapted from OEA. Plan Hidráulico del Jubones, República del Ecuador, Vols. I and III, Mapa 5-A2. (Washington, D.C.: Organization of American States, 1984).

CRITICAL FACILITY INFORMATION DISPLAY

- Location can be shown through the use of basic geometric symbols, such as a point, a line, or an area. For example, points have been used to show cities where facilities are located (Figures 7-3 and 7-4); lines have been used to show general routes of electric power lines and water supply pipes (Figure 7-10); and areas have been used to show location of schools and runways (Figure 7-11).

- Type can be shown by point symbols, for example, educational and medical facilities (Figure 7-3), communications (Figure 7-10), and emergency facilities (Figure 7-5); lines have been used to show various types of highways (Figures 7-11 and 7-12).

- Capacity can be shown by lines, for example, electric transmission line kilowatts (Figure 7-4), and areas have been used to show population size of urban settlements. Combinations of varying

line widths have been used to show both direction and volume of energy flow in pipelines or surface transportation. The size of the lettering for the name of a facility has been used to show reservoir capacity.

- Service Area can be shown by areas. If service areas have not been defined, interpretations or estimates can be made. For example, where there are only one or two medical facilities serving an isolated urban settlement (Figure 7-3), or a single power line or road serving several urban settlements (Figures 7-4 and 7-10), or specific fire stations in a metropolitan area having a uniform pattern of streets or density of development (Figure 7-5), or where the facility is unique, such as an international airport (Figure 7-11), the service areas should be obvious.

- Impact can be shown through various symbols. Computer printout lines have been used to show the intersection of a linear hazard and major water and gas mains (Figure 7-8). Lettered zones can show the percent of telephone system effectiveness (Davis et al., 1982). Computer printout colored patterns can be descriptive in terms of showing the percent of damage affecting specific building types (Figure 7-7).

Critical Facilities To Be Shown

A varying number of different facilities can be shown on a map depending upon scale, symbols, and coverage chosen (Figure 7-7). On a one-sheet national base map only educational and medical facilities are shown (Figure 7-3), or on the one-sheet map of an island numerous facilities are shown or indexed (Figure 7-10). Usually when an area or the number of critical facilities shown is very large, the base maps will be presented on more than one sheet. In some cases certain facilities (Figure 7-5) are shown on one sheet in a series, while other critical facilities-gas and electric transmission lines, or freeways, railways, and bridges-are shown on other sheets in the series. In other cases, three types of facilities and the capacity of one of those types are shown for only one critical facility-electricity (Figure 7-4).

To avoid overcrowding, facilities can be shown by color, by index (Figure 7-3), or by symbol (Figures 7-4 and 7-5). If room is available on the map sheet, or if a written report accompanies the map, photographs of typical and familiar critical facilities can be added.

Accuracy

The locational information on facilities available for the CFM may be accurate, but precision and uniformity may vary when it is transferred. When spherical surfaces are portrayed on a planimetric map, they are only accurate at the contact of the plane with the actual sphere surface. This can affect location in terms of a CFM. Thus, the locational accuracy of the CFM is dependent upon the accuracy of the base map selected.

Figure 7-7 - RISK OF GROUND SHAKING DAMAGE FOR TILT-UP CONCRETE BUILDING MAP

Source: Adapted from Perkins. The San Francisco Bay Area on Shakey Ground. (Oakland, California: Association of Bay Area Governments, 1987).

Various cartographic projection techniques are used to reduce distortion. The projection technique used can be given to alert users. Depending upon the scale and accuracy of the hazard information, this distortion may not be crucial, particularly if the base map has sufficient geographic information to locate the facilities.

Another form of inaccuracy occurs when the information available does not have an acceptable degree of accuracy because of the limited number of field investigations, lack of available records, and incompatible purpose of the original compilation. The planning team should make sure that decisions for project formulation are based on adequate information. Thus, in a case where information is inaccurate an effort should be made to collect additional and more reliable information. When this is not possible, the planning team should express that any decision at this point is based on less than complete information.

c. Key Elements of Critical Facility Information

The user must perceive the destruction or interruption of the critical facility as adversely affecting human lives, property, or socioeconomic activities. Information translated into a CFM must contain at least four elements and be in a format that a nontechnical user can understand.

The key elements that should be shown when preparing a CFM are (a) location, (b) type, (c) size or capacity, and (d) service areas. These elements are needed by planners and decision-makers to assess the impact on (and protect) critical facilities from hazards. For example, if the facilities are not located in a hazardous area, have limited capacity, or serve a small area, they become of less concern in the planning process.

Usually location is provided because of the geographic nature of maps, although sometimes location can be schematic and not actual, as is the case shown in Figure 7-4.

However, other elements-facility type, capacity, and service area-are not always provided. The user must not assume that because the number of health facilities and schools is given, it is also available for other facilities, as in the case shown in Figure 7-3. Neither must they assume that because capacity is given for electric power lines, it is available for other facilities, as is shown in Figure 7-4.

Information on the type of facility is usually provided. Different categories of road and highway systems are often clearly shown on maps. Nevertheless, other details in terms of type, condition, configuration, and age of the structures are usually reserved for more detailed studies applicable to engineering design stages of investment project preparation.

Information on size or capacity may include diameter of a pipeline, number of highway travel lanes, cubic feet per minute of flow, number of beds or operating rooms, and type of fire fighting equipment. Examples of location may be seen in Figures 7-11 and 7-12, of numbers in Figure 7-3, and of sizes in Figures 7-4 and 7-8..

Service areas are usually not shown, but can be estimated. For example, from Figure 7-10 urban electricity and water supply on Saint Lucia can be easily inferred. Rural service areas may be estimated (Figure 7-5) for a certain area, or easily developed for an area (Figure 7-10), or are obvious in the case of the only aqueduct (Figure 7-12). Population served may be given on the map (Figure 7-6), but many other CFM may lack such information (Figure 7-8). When the number of medical facilities, schools, and fire stations is given for urban areas (Figures 7-3 and 7-5), additional information concerning their capacity or type of equipment should be obtained to ascertain their importance to the lifeline network.

3. Compiling Critical Facilities Information

Compiling information on critical facilities to make a CFM is similar to making a MHM. It consists of the same four steps-collecting, evaluating, selecting, and combining information.

The map compilation process and procedures are discussed in various textbooks on preparing maps (for example, "Elements of Cartography" by Robinson et al, 1978). Chapters 1, 2, and 8 through 11 include recommendations applicable to facilities as well as hazards. Early consultation with technical specialists, identification of facilities early in the planning process, and an initial review of the type and content of available information is recommended.

There are various combinations of base, facilities, and hazard maps already prepared that may only require combining information to prepare a CFM. For example:

- A few critical facilities on a general base map to which hazards and other facilities may be added.

- Numerous critical facilities on a general base (Figure 7-10) to which the coastal hazard information (see Chapter 6) can be overlaid and compared.

- Three critical facilities and one hazard (Figure 7-8) which can be transferred to a topographic base map showing other critical facilities. Other hazards can be added.

- Topographic base maps showing numerous critical facilities (Figures 7-11 and 7-12) and one or two hazards to which additional hazards can be added.

Figure 7-8 SELECTED LIFELINES MAP FOR AN URBAN AREA NEAR SALT LAKE CITY (UTAH)

Source: Adapted from Alexander, et al "Applying Digital Cartographic and Geographic Information Systems Technology and Products to the National Earthquake Hazards Reduction Program" in Proceedings of a Workshop on Earthquake Hazards along the Wasatch Front, Utah. (Reston, Virginia: U.S. Geological Survey, Open-File Report 87-154, 1987).

GENERAL CRITERIA FOR DATA COLLECTION WHEN COMPILING CFM

- Collecting base maps and appropriate facilities information from the sources identified in Appendix A.

- Evaluating the uniformity and completeness of such information-areal coverage, detail, content, information needed (location, number, type, size or capacity, and service area), format, and symbols.

- Selecting the most appropriate base map (and scale) to be used, facilities to be shown, and symbols to portray those facilities.

- Combining or integrating the selected facilities information into the CFM in an accurate, clear, and convenient way.

Use of controlled photographic methods and digital registration by computer are excellent ways to reduce the distortion when different types of facilities are compiled or superposed at different scales or maps must be enlarged or reduced to be compatible with the base map. Utria (1988) concluded that, "given the typical financial constraints that prevail... deployment of GIS and computer mapping systems should be first attempted by utilizing already available and reliable information (maps, statistical records, and remote-sensing data)."

4. Sources of Critical Facilities Information

There are many examples of critical facility information that can be used when preparing maps within the integrated development planning process. There is a vast array of sources of facility information including various agencies, offices, or institutions at international, national, regional, and community levels-government and corporate. These agencies, offices, or institutions may be concerned with economic development, resource exploration and extraction, land-use planning, emergency preparedness, disaster response, geotechnical studies, utility service, transportation systems, public works, traffic control, public health and education, national security, and community safety.

Sometimes critical information can be found in the form of engineering studies, "as built" plans, disaster reports, impacts of past events, facility inventories, etc. Usually this information is not readily understood by nontechnical users. It must be translated for planners and decision-makers and transferred onto maps. At other times, the source information is on maps and can be then transferred from land-use, photographic, topographic, demographic, and tourist maps already prepared for settled regions (see Appendix A).

Finally, conventional sources should not be overlooked when collecting critical facilities information. Chapters 8 through 11 suggest authorities responsible for public works, forestry, and agricultural activities as valuable sources of information. Also, Muehrcke (1978), in his appendix on "Sources of Maps," says:

When searching for a map of your own region, a wise first step is to consult local sources. City, county, and regional agencies and businesses can probably provide up-to-date information on the status of regional map coverage. If you live near the state capitol, your search will be simplified, because many state agencies use maps in their daily operations. Some states even employ a state cartographer to coordinate the preparation and dissemination of map resources.

If the bookstores do not stock the maps you need, it is possible that the local library will have them. Many universities and public libraries have been designated as map depositories, which means that they receive a copy of each map published by the larger federal agencies. State and local agencies also are prone to deposit copies of maps they no longer need for special projects with these libraries.

Figure 7-9 COASTAL HAZARDS STRIP MAP

Source: Adapted from Griggs and Savoy (eds.) Living with the California Coast. (Durham, North Carolina: Duke University Press, 1985).

KEY CONSIDERATIONS FOR REDUCING VULNERABILITY IN CRITICAL FACILITIES

- Updating of hazard information and maps by scientists and engineers.

- Continuous updating of facilities information and maps by facilities managers and designers.

- Accurate site investigations by qualified geologists or geotechnical engineers.

- Careful evaluations of facilities by architects, engineers, and safety specialists.

- Prompt adherence to facility emergency procedures by operators and managers.

- Conscientious administration of regulations by building and zoning inspectors and consistent enforcement by government officials.

- Sustained support of inspection and enforcement officials by political leaders.

- Skillful advocacy by public officials and informed interpretation by the courts, if the techniques are challenged.

- Concern for individual, family, and community health, safety, and welfare by developers, investors, donors, and insurers.

5. Assessing the Vulnerability of Critical Facilities

The impact of natural events is increasing as the built environment expands. Failure to consider critical facilities in the development planning process and to protect them from natural hazards will result eventually in the loss of lives, bodily injuries, property damage, delayed recovery, impaired restoration of utilities and other services, and disruption of vital economic activities. Depending upon the location, capacity, and service area of a critical facility, its destruction or disruption can be catastrophic.

The emphasis of an integrated regional development planning study on the development of natural resources, energy, infrastructure, agriculture, industry, human settlements, and social services should include the assessment and protection of those critical facilities necessary for development. This effort promotes the activities oriented to reduce the vulnerability of new facilities by avoiding hazardous areas, designing for resistance, or operating with minimal exposure; and in terms of existing critical facilities, it promotes activities related to strengthening and retrofitting vital systems and implementing emergency preparedness, response, and recovery programs. The considerations identified in the box above should be addressed by planners and decision-makers in their activities to assess and reduce the vulnerability of critical facilities.

According to the Office of the United Nations Disaster Relief Coordinator (1980), information on vulnerability of critical facilities is "less plentiful, less reliable, and less clearly defined than the information usually available on natural hazards.... Various categories of data are required, relating not only to the details of possible material damage, but also to the degree of social and economic disorganization that may take place."

Manuals for identifying and reducing the effects of natural hazards can be prepared for towns, villages, their public officials, and the general population (e.g. St. Helene, 1987). These manuals identify critical facilities at risk, responsible agencies and their role, and actions to reduce hazards, casualties, damages, and outages. They may include matrixes for assessing vulnerability or impact for each hazard and each facility.

It is important to emphasize that the vulnerability of a critical facility does not depend solely on its exposure to hazards. Specific vulnerability depends upon the structure's characteristics, such as uniqueness, type of construction, quality, modification, age, maintenance, height, and first-floor elevation. For example: the expected damage to tilt-up concrete buildings shown in Figure 7-7 is not related to a specific building or site, but rather it is a statistical potential for a selected building type to be damaged given a certain event.

Figure 7-10 LIFELINES NETWORK MAP FOR SAINT LUCIA

Source: Adapted from OAS. Saint Lucia Lifeline Network Map, prepared with the collaboration of the Ministry of Agriculture, Lands, Fisheries, Co-operatives and Labour of the Government of Saint Lucia. (Washington, D.C.: Organization of American States, 1984b).

LIMITATIONS OF CRITICAL FACILITIES ASSESSMENTS WHEN USING A CFM

- The conclusions regarding the performance *of* facilities are hypothetical and not to be construed as site-specific engineering evaluations.

- The damage assessments may be based upon a specific scenario, An event of a different type, size, or location will result in a markedly different pattern of damage.

- The facilities shown on small-scale Index maps may have been transferred by eye from maps of various scales and the user must view larger-scale (more detailed) maps of individual facilities for more precise locations.

- Service area boundaries may have been estimated based on settlement patterns. Facility managers must be consulted for actual boundaries.

- The scale of the map may prohibit sufficient detail to allow use of the maps for individual facility studies. Analyzing the vulnerability of specific facilities or individual sites should be performed by a specialist.

Identifying the various characteristics of critical facilities and assessing their vulnerabilities is a complex and time-consuming task. In particular, weighing and accumulating the impacts may seem almost impossible, but the method indicated in Figure 7-7 for evaluating specific building types and assessing their vulnerability to a specific hazard is usually suitable.

When assessing critical facilities the planning team should also be aware of the limitations included in the box above, in terms of a CFM.

The following Section C describes different methods of combining a CFM with an MHM. The combination of these two sets of maps becomes a useful tool for assessing critical facilities in term of natural hazard impact.

C. COMBINING CRITICAL FACILITIES MAPS AND MULTIPLE HAZARD MAPS

1. Uses of Combined Critical Facilities Maps and Multiple Hazard Maps

There are numerous examples of infrastructure or lifeline information describing critical facilities in the integrated development planning process. This information can be combined with an MHM and used not only for site selection but also for hazard reduction.

There are many benefits in making a CFM, comparing or combining it with an MHM, and integrating both into the development planning process. For example, the location of a critical facility in a hazardous area alerts planners and decision-makers to the fact that in the future a certain facility may confront serious problems. An evaluation of vulnerability dependent upon a careful analysis of equipment and the type, use, and condition of the facility would then be carried out. If the vulnerability of critical facilities is assessed and appropriate reduction techniques are incorporated into each stage of the planning process, social and economic disasters due to natural and other hazards can be avoided or substantially reduced.

The following box includes a listing of the benefits obtained by combining a CFM and an MHM.

1. Uses of Combined Critical Facilities Maps and Multiple Hazard Maps

a. Examples of Combinations of MHM and CFM
b. Regional Planning: The Integrated Development Planning Process

A number of planning and development activities take place at national, regional, and international levels. At these levels, the combination of CFM and MHM can be used by agencies concerned with land-use planning, preparedness and disaster response, utility services including energy, transportation, and communication, and national security and community safety. Moreover, the use of superimposed critical facility information and natural hazard information is important when preparing economic investment projects for national and international bank lending.

A discussion of the planning and development activities which can combine CFM and MHM follows.

Figure 7-11 MID-PENINSULA CITIES STREETS INDEX MAP

Legend: Hazard zones: lightly shaded areas denote flood - prone areas; darker shaded areas denote fault - rupture zones. Numerous critical facilities are shown on this type of base map.

Source: Adapted from San-Mateo Burlingame Board of Realtors. Mid-peninsula cities street index map. (San Jose, California: San Metro-Burlingame Board of Realtors, 1979).

BENEFITS IN COMBINING CFM AND MHM

- Clear and convenient representation of critical facilities in hazardous areas is provided.

- wareness of hazards to critical facilities occurs among project planners and decision-makers prior to project implementation.

- A more concise focus on the effect and impact of natural phenomena on critical facilities is possible during the early stages of the planning study.

- Identification of the extent to which new development can be affected by the failure or disruption of existing critical facilities as a consequence of a natural event can be made.

- Hazards affecting new critical facilities may be reduced.

- More realistic benefit-cost ratios for new development are possible.

- Identification of the need for more (or better) investigations into process or prediction of hazards is created.

- Study areas can be identified and subdivided into sub-areas requiring different assessments, emergency preparedness, immediate recovery, or specific reduction techniques.

a. Examples of Combinations of MHM and CFM

The combination of CFM and MHM has been very effective for land-use planning, preparing for emergencies, increasing public awareness, and planning development.

Land-Use Planning

Land-use planning is one of the most efficient ways of avoiding development or reducing the density of development in hazardous areas. The Santa Clara County, California, Planning Department (1975) prepared an extensive land-use plan in compliance with a state law requiring all cities and counties to prepare and adopt a seismic safety plan. All the potential earthquake hazards-liquefaction, lurching, lateral spreading, differential settlement, ground displacement, landslides, and flooding due to dike failure-were combined on a seismic-stability map. Three zones were then used to indicate three different degrees of need for detailed site investigations, as determined by the level of hazards (Figure 7-5).

Urban settlements, transportation, utilities, and emergency facilities were then superimposed on the seismic-stability map. Citizens, as well as planners and decision-makers, were made aware of potential damage when presented with mapped information depicting homes, freeways, railroads, bridges, pipelines, power lines, hospitals, and fire stations located in the varying hazard zones on the map. In addition, large-scale maps are available to show potential hazards in relation to property boundaries (see Chapter 6).

Another county in California (Santa Barbara County Planning Department, 1979), in preparing its seismic safety plan, provided the location of several critical facilities for orientation, namely, highways, airports, railroads, air force base, and a federal correctional institution. (See the section in Chapter 6 on "Information Processed by Computer.")

Development Regulations

Sometimes critical facilities and hazards information are shown on a map selected for regulatory purposes. For example, the California Legislature (1972) provides for public safety by restricting development in surface fault rupture zones. These regulatory zones encompass 34 counties and 75 cities in California; reproducible copies of pertinent maps (Figure 7-12) have been provided to each affected county and city. Numerous critical facilities are shown on this type of map (e.g., major highways, overpasses, aqueducts, pipelines, and electrical transmission lines).

Disclosure in Land Title Transfers

Often the combination of critical facilities together with natural hazard information is used on maps selected for awareness and orientation of purchasers of land. For example, the U.S. Congress (1974), the California Legislature (1972), and the Santa Clara County Board of Supervisors (1978) require lenders or sellers of real property to inform the prospective borrower or buyer as to whether the property is located in a flood, fault rupture, or landslide prone area.

Figure 7-12 U.S. GEOLOGICAL SURVEY PUTTER RIDGE QUADRANGLE

Legend: Part of the U.S. Geological Survey Ritter Ridge Quadrangle (topographic series), which has been used by the California Division of Mines and Geology (1979) as a base

map for regulating fault-rupture hazards in the Special Studies Zones (lighter lines) along part of the San Andreas fault. Traces of potentially active faults (heavier lines) are indicated by solid lines where accurately located, by a long dash where approximately located, by a short dash where inferred, and by dots where concealed. Numerous critical facilities are shown on this type of base map.

> Source: Adapted from California Division of Mines and Geology, Ritter Ridge Quandrangle-Special Studies Zones Map. (Sacramento, California: California Division of Mines and Geology, 1979).

To assist lenders and sellers in complying with these laws, local boards of real estate agents have prepared street-index maps showing the hazard zones. Figure 7-11 shows two of these hazard zones. The publisher of these street/index maps used topographic maps for the base map. Numerous critical facilities are shown on this type of base map (for example, major highways, airports, overpasses, schools, railways, electric transmission lines, and sewage disposal facilities).

Public Awareness

Often a prerequisite to obtaining support for integrated development planning and hazard reduction is public awareness of not only the hazards but those critical facilities that will be affected. As an example, Griggs and Savoy (1985) mapped more than 1,100 miles of Pacific Ocean coastline in California into three hazard zones reflecting a combination of coastal erosion, wave-cut cliffs, slumping, bluff retraction, landslides, creep, rockfalls, and storm waves. The authors intended to help their readers "make more educated decisions about building, buying, and living on the shorelines." Various critical facilities are shown (for example, a major highway, railway, and military base; see Figure 7-9).

Emergency Preparedness Planning

Alexander et al. (1987) used a digital cartography and geographic information system technology to depict natural hazards-landslides, liquefaction, floods, and fault ruptures. These hazards were then combined with various critical facilities (for example, fault rupture with schools, fire stations, medical facilities, and police stations; and with major gas and water mains; see Figure 7-8). The nature and capability of a geographic information system provides an excellent basis for displaying such information for emergency preparedness planning (see Chapter 5).

Davis et al. (1982), mapped the critical facilities that would require a major emergency response from a damaging earthquake. Facilities included highways, airports, railroads, marine facilities, communication lines, water-supply and waste-disposal facilities, and electrical power, natural gas, and petroleum lines. The communications map, for example, assesses telephone-system performance following a postulated earthquake. Maps for water-supply and waste-disposal facilities show the location and estimates of damage to facilities. Most of the lifelines are susceptible to significant damage that could require a major emergency response effort.

This last study covers a large spectrum of issues. Each CFM is accompanied by a discussion of the general patterns of the effects of an earthquake; for example:

> Not all of the [telephone] systems in the greater Los Angeles [California] region are set up to process emergency calls automatically on previously established priority bases. Thus overloading of equipment still in service could be very significant.

Also, each anticipated mapped event is accompanied by specific examples of expected damage; for example:

> The several hydroelectric-power plants located on the California and Los Angeles aqueducts in northwestern Los Angeles County and the Devil Canyon Power Plant near San Bernardino will be out of service for an extended period of time due to major damage to both of the aqueduct systems.

In addition, each map is also accompanied by emergency planning needs; for example:

> Emergency planners need to identify major emergency routes that can be most readily opened immediately following the earthquake... alternative emergency routes should be selected which are at grade, wide, not flanked by buildings which are likely to be damaged, and not likely to be obstructed by fallen powerlines or other obstructions.

Site Selection

Often the likelihood, location, and severity of natural hazards are used as criteria in selecting a site for a critical facility. For example, Perkins (1978) identified potential Class I sites as part of a regional solid-waste-management plan. Class I sites are defined as disposal areas for such hazardous wastes as toxic chemicals, soluble industrial wastes, saline brines, and unquenched incineration ashes.

The Perkins study identifies areas that warrant further study for use as disposal sites for hazardous wastes, and recommends that these disposal sites and facilities be located so as not to adversely affect human health and safety, air and water quality, wildlife, critical environmental resources, and urbanized areas. Sites that may be subject to inundation, washout, faulting, liquefaction, landsliding, or accelerated erosion were deemed unacceptable.

The location and assessment of natural hazards have been a key determination in the evaluation and selection of sites for other critical facilities-offshore structures, nuclear generating stations, hydraulic fill dams, water pipes, liquefied natural gas terminals, educational facilities, and electrical substations.

b. Regional Planning: The Integrated Development Planning Process

The OAS Department of Regional Development and Environment has used mapping techniques for combining natural hazards and critical facilities information in its planning studies. Multiple hazard maps for national and regional areas were prepared for Ecuador, Honduras, St. Kitts and Nevis, and Saint Lucia and combined with facilities information, which included lifelines, energy supplies, health installations, high-rise structures, water supply, and transportation. A brief discussion of these studies follows.

Ecuador

After listing all development activities for the Santiago and Mira River basins, the planning team evaluated transportation and other infrastructure development proposals. Their workplan included not only a study of the region's human settlement system but the presentation of a chapter on infrastructure development strategy. The largest investment recommended (40 percent of the total) was allocated to critical facilities, namely, developing port facilities, a road system, telecommunication services, energy and rural electrification projects, and other infrastructure (OAS, 1984a).

In another development project (Plan Hidráulico del Jubones), the OAS Department of Regional Development and Environment (1984c) mapped many of the critical facilities-electrical (Figure 7-4) and health and educational (Figure 7-6).

Honduras

The diagnostic stage of the Proyecto de Desarrollo Islas de la Bahía y Atlántida included a flood hazard map (see Chapter 6) which identified several critical facilities-electric transmission lines, highways, railways, hospitals, bridges, schools, and fuel storage. This type of infrastructure information is often available on maps at scales of 1:50,000 or larger prepared by national geodesic institutions.

St. Kitts and Nevis

As part of a development planning study, a critical infrastructure assessment can be addressed (Bender, 1986). Settlements were evaluated in terms of the potential effect of hazardous events. The study included the identification of major critical facilities, such as police, fire, and medical facilities. Their vulnerability was discussed and summarized as follows:

- Medical facilities may be susceptible to wind damage and flooding.

- Electric power lines are susceptible to wind damage and, to a lesser extent, to flooding, erosion, and debris flows.

- The domestic water supply is susceptible to flooding; pipelines from intakes in the higher reaches of the mountains are often damaged at locations where they cross guts.

- The road network and the electric power distribution system are vulnerable to service interruption.

- Damage to schools, medical facilities, and designated first aid stations and shelters can be expected.

Specific recommendations were then made to reduce damage to the road system, water supply, emergency shelters, first aid stations, medical facilities, and school buildings.

Saint Lucia

Extensive work on hazard awareness and mitigation has been carried out by the government in Saint Lucia. Of particular interest is a study (St. Helene, 1986) which identified the risks associated with known natural hazards for ten coastal settlements and their surrounding areas. Critical facilities were described using the generic titles of communications, emergency services, health, education, and energy (Figure 7-10), and facilities subject to hazards were examined (airports, roads, hotels, dynamite storage, a school for the deaf, churches, bridges, post office, electric power poles, navigational lighthouse, electric transformers, sea defense walls, petrol depots, and sewage treatment plants).

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Southern California Earthquake Data Center (https://scedc.caltech.edu/index.html)

Earthquake Information

Fault Name Index

A (faults.html#a) | B (faults.html#b) | C (faults.html#c) | D (faults.html#d) | E (faults.html#e) | F (faults.html#f) | G (faults.html#g) | H (faults.html#h) | I (faults.html#i) | J (faults.html#j) | K (faults.html#k) | L (faults.html#l) | M (faults.html#m) | N (faults.html#n) | O (faults.html#o) | P (faults.html#p) | Q (faults.html#q) | R (faults.html#r) | S (faults.html#s) | T (faults.html#t) | U (faults.html#u) | V (faults.html#v) | W (faults.html#w) | X (faults.html#x) | Y (faults.html#y) | Z (faults.html#z)

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Alamo Thrust (alamo.html)
Arrastre Canyon Narrows Fault (arrastre.html)
Arroyo Parida Fault (arroyo.html)
Arrowhead Fault (arrowhead.html)
Ash Hill Fault (panamint.html#ash)
Avawatz Mountains Fault (avawatz.html)

B

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Baker Fault (baker.html)
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Baseline Fault (losalamos.html#baseline)
Bicycle Lake Fault (bittersprings.html)
Big Mountain Fault (bigmountain.html)
Big Pine Fault (bigpine.html)
Bitter Springs Fault (bittersprings.html)
Blackwater Fault (blackwater.html)
Blake Ranch Fault (blakeranch.html)
Blue Cut Fault (bluecut.html)
Bowen Ranch Fault (tunnel.html)
Brawley Fault Zone (brawley.html)
Brawley Seismic Zone (brawleyseismic.html)
Breckenridge Fault (breckenridge.html)
Broadwell Lake Fault (broadwell.html)
Brown Mountain Fault (brown.html)

Buck Ridge Fault (sanjacinto.html#buck)
Buena Vista Fault (buenavista.html)
Bullion Fault (bullion.html)
Burnt Mountain Fault (burnt.html)

C

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Cady Fault (cady.html)
Calico Fault (calico.html)
Camp Rock Fault (camprock.html)
Casa Loma Fault (sanjacinto.html#casaloma)
Cerro Prieto Fault (cerroprieto.html)
Chatsworth Fault (chatsworth.html)
Chino Fault (chino.html)
Clamshell-Sawpit Canyon Fault (clamshell.html)
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Clearwater Fault (clearwater.html)
Cleghorn Fault (cleghorn.html)
Cleghorn Lake Fault (cleghornlake.html)
Copper Mountain Fault (copper.html)
Coronado Bank Fault Zone (coronado.html)
Coyote Creek Fault (sanjacinto.html#coyotecreek)
Coyote Lake Fault (coyotelake.html)
Crafton Hills Fault Zone (craftonhills.html)
Cucamonga Fault Zone (cucamonga.html)

D

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Duarte Fault (sierramadre.html#duarte)

E

Eagle Rock Fault (eaglerock.html)
Earthquake Valley Fault (earthquake.html)
El Modeno Fault (elmodeno.html)
Elmore Ranch Fault Zone (elmore.html)
El Paso Fault (garlock.html#elpaso)
Elsinore Fault Zone (elsinore.html)
Emerson Fault (emerson.html)
Etiwanda Avenue Fault (redhill.html)
Eureka Peak Fault (eurekapeak.html)
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F

Frazier Mountain Thrust (frazier.html)
Furnace Creek Fault Zone (furnace.html)

G

Galway Lake Fault (galway.html)
Garlic Spring Fault (garlicspring.html)
Garlock Fault Zone (garlock.html)
Garnet Hill Fault (garnethill.html)
Gillis Canyon Fault (sanjuan.html)
Glen Helen Fault (sanjacinto.html#glenhelen)
Glen Ivy North Fault (elsinore.html#glenivy)
Glen Ivy South Fault (elsinore.html#glenivy)
Goldstone Fault (goldstone.html)
Granite Mountains Fault Zone (granite.html)
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Gravel Hills Fault (harper.html)

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Hidalgo Fault (hidalgo.html)
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Hollywood Fault (hollywood.html)
Holser Fault (holser.html)
Homestead Valley Fault (homestead.html)
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Imperial Fault (imperial.html)
Independence Fault (sierranevada.html)

J

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Johnson Valley Fault (johnson.html)

K

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Kern Gorge Fault (kerngorge.html)
Kickapoo Fault (kickapoo.html)
Kramer Hills Fault (kramerhills.html)

L

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Landers Fault (kickapoo.html)
La Panza Fault (lapanza.html)
Lavic Lake Fault (laviclake.html)
La Vista Fault (lioncanyon.html)
Leach Lake Fault (garlock.html#leach)
Lenwood Fault (lenwood.html)
Leuhman Fault (kramerhills.html#leuhman)
Lion Canyon Fault (lioncanyon.html)
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Llano Fault (llano.html)
Lockhart Fault (lockhart.html)
Lone Pine Fault (owensvalley.html)
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Los Alamitos Fault (losalamitos.html)
Los Alamos Fault (losalamos.html)
Los Osos Fault Zone (lososos.html)
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Lytle Creek Fault (sanjacinto.html#lytle)

M

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Manix Fault (manix.html)
Mesa - Rincon Creek Fault (mesa.html)
Mesquite Lake Fault (mesquitelake.html)
Mill Creek Fault (millcreek.html)
Mint Canyon Fault (mintcanyon.html)
Mirage Valley Fault Zone (miragevalley.html)
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Morales Fault (morales.html)
Morongo Valley Fault (morongovalley.html)
Mt. General Fault (mtgeneral.html)
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Mule Spring Fault (garlock.html#leach)

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Newport-Inglewood - Rose Canyon Fault Zone (newportrose.html)
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Northridge Thrust (oakridge.html)

O

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Oak View Fault (lioncanyon.html)
Ocotillo Ridge Fold (northfrontal.html)
Old Woman Springs Fault (oldwomansprings.html)
Ord Mountains Fault (northfrontal.html)
Owens Valley Fault Zone (owensvalley.html)
Owl Lake Fault (owllake.html)
Ozena Fault (ozena.html)

P

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San Gabriel Fault (sangabriel.html)
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Springs Fault (springs.html)
Stoddard Canyon Fault (stoddard.html)
Superstition Hills Fault (superstitionhills.html)
Superstition Mountain Fault (superstitionmt.html)

T

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Tiefort Mountain Fault Zone (tiefort.html)
Towne Pass Fault (townepass.html)
Tunnel Ridge Fault (tunnelridge.html)

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Ventura Fault (pitaspoint.html)
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Villanova Fault (lioncanyon.html)
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Wheeler Ridge Fault (wheelerridge.html)
Whittier Fault (whittier.html)
White Wolf Fault (whitewolf.html)
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X

Y

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Z

Caltech (http://www.caltech.edu)

Seismological Laboratory California Institute of Technology (http://www.seismolab.caltech.edu/)

USGS science for a changing world (https://earthquake.usgs.gov/)

ANSS (https://www.usgs.gov/natural-hazards/earthquake-hazards/anss-advanced-national-seismic-system)

SCEC AN NSF+USGS CENTER (https://www.scec.org/)

nehrp (https://www.nehrp.gov/)

Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources

Society of Vertebrate Paleontology
Impact Mitigation Guidelines Revision Committee

Abstract
Fossils are nonrenewable paleontological resources that are subject to impacts from land development. Procedures are presented for evaluating the potential for impacts of a proposed action on paleontological resources and for mitigating those impacts. Impact mitigation includes pre-project survey and salvage, monitoring and screen washing during excavation to salvage fossils, conservation and inventory, and final reports and specimen curation. The objective of these procedures is to offer standard methods for assessing potential impacts to fossils and mitigating these impacts.

Introduction
Fossils are nonrenewable paleontological resources that are afforded protection by federal, state, and local environmental laws and regulations. The Paleontological Resources Preservation Act (PRPA) of 2009 calls for uniform policies and standards that apply to fossils on all federal public lands. All federal land management agencies are required to develop regulations that satisfy the stipulations of the PRPA. Section 6302 of the PRPA mandates that federal agencies "*shall manage and protect paleontological resources on Federal land using scientific principles and expertise.*" Thus, federal agencies need the help of the professional paleontological community in the formulation and implementation of these PRPA-mandated policies and regulations. The potential for destruction or degradation of paleontological resources on both public and private lands selected for development under the jurisdiction of various governmental planning agencies is recognized. The standard procedures below are intended to be applicable to both private and public lands under the jurisdiction of local, city, county, regional, state, and federal agencies. Protection of paleontological resources includes: (a) assessment of the potential for land to contain significant paleontological resources which could be directly or indirectly impacted, damaged, or destroyed by proposed development and (b) formulation and implementation of measures to mitigate these adverse impacts, including permanent preservation of the site and/or permanent preservation of salvaged fossils along with all contextual data in established institutions.

Assessment of the Paleontological Potential of Rock Units
Rock units are described as having (a) high, (b) undetermined, (c) low, or (d) no potential for containing significant paleontological resources.

High Potential
Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e. g., ashes or tephras), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e. g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous

and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, etc.). Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

Undetermined Potential

Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist (see "definitions" section in this document) to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.

Low Potential

Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e. g. basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.

No Potential

Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection nor impact mitigation measures relative to paleontological resources.

Discussion

It is extremely important to distinguish between archaeological and paleontological resources (see "definitions" section in this document) when discussing the paleontological potential of rock units. The boundaries of an archaeological resource site define the areal/geographic extent of an archaeological resource, which is generally independent from the rock unit on which it sits. However, paleontological sites indicate that the containing rock unit or formation is fossiliferous. Therefore, the limits of the entire rock unit, both areal and stratigraphic, define the extent of paleontological potential.

It is also important to ascertain if the paleontological resources are uniformly distributed throughout a rock unit or if they are confined as localized concentrations to specific members or facies. Using this information, paleontologists can develop maps which suggest areas that are likely to contain paleontological resources. These maps (Paleontological Resource Potential Maps) form the basis for preliminary planning decisions on which areas require a detailed paleontological resource impact assessment by a qualified professional paleontologist and which areas do not. Lead agency evaluation of a proposed project relative to such paleontological resource potential maps should trigger a "request for

opinion" from a qualified professional paleontologist, state paleontological clearing house, or an accredited institution with an established paleontological repository housing paleontological resources from the region of interest.

The determination of the paleontological resource potential of an area proposed for development is first founded on a review of pertinent geological and paleontological literature, geological maps, and on records in fossil locality databases of paleontological specimens deposited in institutions (e. g., museums and universities). This preliminary review may clearly indicate that particular rock units have known high potential. If the paleontological resource potential of a rock unit cannot be delimited from the literature search and specimen records, a field survey by a qualified professional paleontologist will be necessary to determine the fossiliferous potential and the distribution or concentrations of fossils within the extent of the rock units present in a specific project area. The field survey may need to extend outside the defined project limits to areas where the relevant rock units are better exposed. If the rock units in an area are determined to have a high potential for containing paleontological resources, a program to mitigate impacts to fossil resources must be developed. In areas containing rock units with high potential, a preconstruction survey (intensive reconnaissance) may be necessary to locate surface concentrations of fossils which might require salvage in advance of excavations to avoid delays to construction schedules.

Measures to Mitigate Adverse Impacts from Development

Measures for adequate protection or salvage of significant paleontological resources are applied to areas determined to contain rock units that have either a high or undetermined potential for containing significant fossils. The Paleontological Resource Preservation Act of 2009 establishes a uniform code for decision-making on all federal lands. Specific mitigation measures generally need not be developed for areas of low paleontological potential. Developers (public and private) and contractors should be made aware, however, that if there is not an on-site monitor it will be necessary to contact a qualified professional paleontologist if fossils are unearthed in the course of excavation. This contingency should be planned for in advance. In order to save time and project delays, in the advance planning phases of a project the developer should contact a qualified professional paleontologist and arrange for the salvage of any unanticipated fossils. The paleontologist will then salvage the fossils and assess the necessity for further mitigation measures, if applicable. Decisions regarding the intensity of the paleontological resource impact mitigation program will be made by the project paleontologist on the basis of the significance of the paleontological resources, and their biostratigraphic, biochronologic, paleoecologic, taphonomic, and taxonomic attributes, not on the ability of a project proponent to fund the paleontological resource impact mitigation program.

In areas determined to have high or undetermined potential for significant paleontological resources, an adequate program for mitigating the impact of development must include:

1. an intensive field survey and surface salvage prior to earth moving, if applicable;

2. monitoring by a qualified paleontological resource monitor (see "definitions" section in this document) of excavations in previously undisturbed rock units;

3. salvage of unearthed fossil remains and/or traces (e. g., tracks, trails, burrows, etc.);

4. screen washing to recover small specimens, if applicable;

5. preparation of salvaged fossils to a point of being ready for curation (i. e., removal of enclosing matrix, stabilization and repair of specimens, and construction of reinforced support cradles where appropriate);

6. identification, cataloging, curation, and provision for repository storage of prepared fossil specimens; and

7. a final report of the finds and their significance.

All phases of mitigation must be supervised by a qualified professional paleontologist who maintains the necessary paleontological collecting permits and repository agreements. All field teams will be supervised by a paleontologist qualified to deal with the significant resources that might be encountered. The lead agency must assure compliance with the measures developed to mitigate impacts of excavation. To assure compliance at the start of the project, a statement that confirms the site's paleontological potential, confirms the repository agreement with an established public institution, and describes the program for impact mitigation, must be deposited with the lead agency and contractor(s) before any ground disturbance begins. In many cases, it will be necessary to conduct a salvage program prior to grading to prevent damage to known paleontological resources and to avoid delays to construction schedules. The impact mitigation program must include preparation, identification, cataloging, and curation of any salvaged specimens. All field notes, photographs, stratigraphic sections, and other data associated with the recovery of the specimens must be deposited with the institution receiving the specimens. Since it is not professionally acceptable to salvage specimens without preparation and curation of specimens and associated data, costs for this phase of the program must be included in the project budget. The mitigation program must be reviewed and accepted by the lead agency. If a mitigation program is initiated early during the course of project planning, construction delays due to paleontological salvage activities can be minimized or even completely avoided.

Standard Procedures
These standard procedures for paleontological resource impact assessment and mitigation are designed to apply to areas containing rock units with high, low, and undetermined paleontological resource potential.

Assessment before Construction Starts
An adequate preconstruction paleontological resource impact assessment is the key to developing an adequate paleontological resource impact mitigation program. Only a professional paleontologist is qualified to prepare a paleontological resource impact assessment. An adequate assessment of potential impacts typically includes all the following elements:

1. Literature Search—A review of the pertinent paleontological, geological, geotechnical, and environmental literature provides an information baseline for evaluating the extent of previous paleontological work in an area. Such a review also provides a fundamental basis for formulating mitigation plans and for understanding the significance of paleontological resources. The preconstruction assessment should also include examination of geotechnical reports, borehole logs, and geologic cross sections to address whether project excavations will impact rock units with high potential.

2. Records Search—A review of institutional localities and specimen records provides a means for determining the extent of previous fieldwork and fossil recovery in, and adjacent to, an area of interest. This task can be accomplished either by sending a written request for information to the relevant institution(s) or visiting the institution to review the records directly. A simple, on-line search of an institution's records is often incomplete and inadequate for determining the number and extent of known fossil localities in an area.

3. Consultation with Others—The preconstruction assessment should include consultation with geologists and paleontologists knowledgeable about the paleontological resource potential of rock units present in the vicinity of the proposed project.

4. Field Survey—The assessment should include a field survey by a qualified professional paleontologist and approved staff, as needed, to determine the paleontological potential of each rock unit, to re-examine any known fossil localities on or near the project, to search for unknown fossil localities, and to delimit the specific boundaries of rock units within the project area.

5. Reports—A paleontological resource impact assessment report and a project-specific paleontological resource impact mitigation program should be prepared based upon data gathered during the assessment.

6. Agency Confirmation—Prior to ground disturbance, the lead agency should review the paleontological resource impact assessment and proposed mitigation program to determine the adequacy of the proposed program.

7. Repository Agreement—The project paleontologist should have a repository agreement arranged prior to the start of earth-moving for the project.

8. Pre-excavation meetings—The project paleontologist should hold pre-excavation meetings with representatives of the lead agency, the developer or project proponent, and contractors to

explain the importance of fossils, the laws protecting fossils, the need for mitigation, the types of fossils that might be discovered during excavation work, and the procedures that should be followed if fossils are discovered. Defining the process of salvaging fossils will reduce project delays.

Paleontological Resource Mitigation Plan

Prior to any ground disturbance at the project site, a paleontological resource mitigation plan should be prepared by a qualified professional paleontologist, who then will implement the plan as the project paleontologist, program supervisor, and principal investigator. The paleontological resource mitigation plan establishes the ground rules for the entire paleontological resource mitigation program. Excavations at the project site may reveal conditions unanticipated when the paleontological resource mitigation plan was prepared. These conditions may require additional tasks not described in the previously prepared project impact mitigation plan. The project paleontologist should be the person who makes these project-specific modifications to the paleontological resource mitigation program in consultation with representatives of the lead agency and project proponent.

Adequate Monitoring

For excavations in rock units of known high potential, the project paleontologist or paleontological monitor will need to be present initially during 100% of the earth-moving activities. After 50% of excavations are complete in either an area or rock unit and no fossils of any kind have been discovered, the level of monitoring can be reduced or suspended entirely at the project paleontologist's discretion. For excavations in rock units with high or undetermined potential, it is never acceptable to have excavation monitoring done by construction workers, engineers, or persons who are not qualified paleontological resource monitors (see "definitions" section below). For excavations in rock units determined by a qualified professional paleontologist to have low potential, non-paleontologists may monitor for fossils. If potential paleontological resources are discovered during excavations in a rock unit with low potential, all ground disturbance in the vicinity of the find should stop immediately until a qualified professional paleontologist can assess the nature and importance of the find and recommend appropriate salvage, treatment, and future monitoring and mitigation.

Paleontologists who monitor excavations must be experienced in locating and salvaging fossils, and collecting necessary associated critical data. The paleontological resource monitor must be able to document the stratigraphic context of fossil discovery sites. Paleontological resource monitors must be properly equipped with tools and supplies to allow rapid removal of specimens. The monitor must be empowered to temporarily halt or redirect the excavation equipment away from fossils to be salvaged. Some lead agencies require that paleontological monitors be approved prior to performing any field work.

To reduce potential delays to excavation schedules, provision must be made in the mitigation program for additional assistants to monitor or help in removing large or abundant fossils. If many pieces of heavy equipment are in use simultaneously but at diverse locations, each location will need to be individually monitored.

Macrofossil Salvage

Many specimens recovered from excavations are readily visible to the eye and large enough to be easily recognized and removed. Upon discovery of such macrofossils, the monitor will flag the fossiliferous area for avoidance until the project paleontologist can evaluate the resource and develop plans for removal/salvage of these specimens. Some fossil specimens may be fragile and require consolidation

with archival quality media (e. g., Acryloid, Butvar, or Vinac) before moving. Others may require protection by encasing them within a plaster jacket before removal to a laboratory for later preparation and conservation. Occasionally specimens encompass all or much of a skeleton and will require moving either as a whole or in multiple blocks for later preparation. Such specimens require time to excavate and strengthen with a hardening solution before removal and the patience and understanding of the contractor to recover the specimens properly. It is thus important that contractors and developers are fully aware of the importance and fragility of fossils for their recovery to be undertaken with the optimum chances of successful extraction.

Avoidance and Site Protection

In exceptional instances the process of preconstruction assessment or construction monitoring itself may reveal a fossil occurrence of such importance that salvage or removal is unacceptable to all concerned parties. In such cases, the project design may need to be modified to avoid, protect and/or exhibit the fossil occurrence, e. g., in the floor or wall of a museum or as a basement exhibit in a mall. Under such circumstances, the site may be declared and dedicated as a protected resource of public value. Associated fossil fragments salvaged from such a site should be placed in an approved institutional repository. Federal land managers have the ability to set aside such exceptional areas providing documentation supports special management considerations.

Microfossil Salvage

Many significant vertebrate fossils (e. g., small mammal, bird, reptile, amphibian, or fish remains) are too small to be readily visible within the sedimentary matrix and are referred to as "microvertebrates". Small fossils also include non-vertebrate paleoenvironmental indicators (e. g., foraminifers, small gastropods, and plant seeds). Fine-grained sedimentary horizons (e. g., mudstones and paleosols) most often contain such fossils, which are typically recovered through a process of bulk matrix sampling followed by screen washing through 20 and/or 30 mesh screens. If indicators of potential microvertebrate fossils are found (e. g., plant debris, abundant mollusks, clay clasts, carbonate-rich paleosols, or mudstones) screening of a "test sample" (0.4 cubic yard/meter, ~600 lbs) may produce significant returns and indicate whether or not a larger sample needs to be screen washed. An adequate sample (standard sample) consists of approximately 4.0 cubic yards/meters (6,000 lbs or 2,500 kg) of matrix from each site, horizon, or paleosol. However, the uniqueness of the microvertebrate fossils recovered may justify screen washing even larger amounts. With this possibility in mind, two standard samples (~8.0 cubic yards/meters) or more as determined by the project paleontologist should be collected when the discovery is first made and set aside in case processing of a larger sample is later determined to be necessary. The developer must recognize that funding must be available to process these bulk matrix samples, thereby reducing volume to facilitate cost-effective storage of fossil specimens.

To avoid construction delays, samples of matrix may need to be removed from the project site and processed elsewhere. Chemicals (e. g., detergents, weak acids, orange oil, etc.) may be necessary to facilitate the breakdown of matrix. In some cases the concentrate will need to be further processed using heavy liquids (e. g., zinc bromide, polytungstate, or tetrabromide) to remove mineral grains and create a concentrate enriched with microvertebrate bones and teeth. The concentrate should be directly examined under a microscope to locate and remove individual microfossils.

Samples

To place fossils within a temporal context, dating of rock units may be necessary. If available, samples of volcanic ash and organic carbon should be collected for radiometric and/or thermoluminescence dating.

When appropriate, oriented samples should also be collected for paleomagnetic analysis. In addition, samples of fine-grained matrices should be collected from measured stratigraphic sections for microfossil (e. g., pollen, spores, dinoflagellates, ostracodes, diatoms, foraminifers, etc.) analyses. Other matrix samples may need to be collected and retained with the samples submitted to the repository institution for future analysis, for clast source analysis, or as witness to the source rock unit and possibly for procedures not yet envisioned. The project paleontologist should determine which of these samples should be immediately processed and which samples can be stored for later processing. Many museums will not accept such rock or sediment samples for curation and storage.

Preparation

Salvaged specimens must be prepared for identification and curation (not exhibition). This means removal of all or most of the enclosing sediment to reduce the specimen volume, increase surface area for the application of consolidants/preservatives, provide repairs and stabilization of fragile/damaged areas on a specimen, and allow identification of the fossils. Large specimens may require construction of reinforced plaster or fiberglass cradles. Removal of excess matrix from macrofossils during the preparation process will facilitate identification, reduce storage space, and reduce the cost of storage. Project paleontologists need to be aware that many museums will not accept specimens that are not fully prepared for permanent curation.

Identification and Cataloging

Specimens must be identified by competent qualified paleontological specialists to the lowest taxonomic level possible. Ideally, identification of individual specimens will be to genus and species and to skeletal element. Specimens must be cataloged and a complete list of specimens to be accessioned into the collections must be prepared for the curator of the repository institution. Batch identification and batch numbering (e. g., “mammals, 75 specimens”) is unacceptable.

Analysis

Although academic research questions should dictate the field methods and types of data recorded, the overall goal of a paleontological resource mitigation program is not to conduct research but rather to discover and salvage significant fossil remains, record relevant stratigraphic and taphonomic data, and curate and permanently house the salvaged fossil remains for future study. However, before salvaged specimens are curated, either the project paleontologist or a competent qualified paleontological specialist should determine the significance and importance of the salvaged specimens and this information should be included in the final report.

Storage

Adequate curation and storage of salvaged specimens in an approved repository institution is an essential goal of the paleontological mitigation program. Adequate storage must include curation of individual specimens into the collections of a recognized, not-for-profit repository with a permanent curator, such as a museum or a university (institution). A complete set of GPS data, field notes, photographs, locality forms, and stratigraphic sections must accompany the fossil collections. Specimens must be stored in a fashion that allows retrieval of specific, individual specimens by future researchers.

Specific requirements of the designated repository must be established prior to the start of the project, field salvage work, and laboratory analysis. Adequate advance notice of funds required by the repository for curation is needed for the benefit of project funding. Costs of the project should cover the necessary curatorial supplies such as, but not limited to, trays, vials, foam, and storage cabinets or shelves to provide for the appropriate curation of the specimens.

Reporting

1) Interim report
At the close of the excavation phase of a project, an interim report should be prepared. This interim report should summarize exceptional fossil discoveries, note areas where monitoring occurred and fossils were collected, and list tasks remaining for preparation, identification, and curation of the salvaged specimens. In the interim report, the preconstruction repository agreement should be appended and any additional repository considerations and costs should be described.

2) Final report
After preparation, identification, analysis of significance, and curatorial inventory of the salvaged specimens is complete, a final report must be prepared by the project paleontologist including a summary of the field and laboratory methods, site geology and stratigraphy, faunal/floral list(s), and a brief statement of the significance and relationship of the fossils discovered to similar fossils found elsewhere The final report should emphasize the discovery of any new or rare taxa, or paleoecological or taphonomic significance. A complete set of field notes, geologic maps, stratigraphic sections, and a list of identified specimens must be included in or accompany the final report. This report should be finalized only after all aspects of the mitigation program are completed, including preparation, identification, cataloging, and curatorial inventory.

The final report (with any accompanying documents) and repository curation of specimens and samples constitute the goals of a successful paleontological resource mitigation program. Full copies of the final report should be deposited with both the lead agency and the repository institution with the request that all locality data remain confidential and not made available to the general public.

Compliance
From the beginning of the project, the lead agency should assure compliance with measures to protect fossil resources by:

1. requesting during initial planning phases an assessment and program for impact mitigation that is consistent with these SVP Standard Procedures;

2. ensuring the adequacy of the proposed mitigation measures;

3. acknowledging arrangements for salvaged specimens to be permanently housed in an institutional paleontological repository;

4. ensuring that the paleontological resource mitigation program is supervised by a qualified professional paleontologist;

5. ensuring that all monitoring for paleontological resources is performed by qualified paleontological resource monitors;

6. inspecting the monitoring program in the field periodically during project construction;

7. ensuring that specimens are prepared, identified, cataloged, and properly curated;

8. requiring an interim and final report before issuing final occupancy permits or equivalent documents; and

9. ensuring that the final report is complete and adequately describes the methods and results of the mitigation program.

The project paleontologist should be responsible for:

1. assessing potential impacts to paleontological resources and developing a program for impact mitigation during initial planning phases;

2. obtaining a repository agreement, and ensuring repository acceptance of specimens;

3. ensuring implementation of the mitigation measures; and

4. preparing the interim and final reports.

Acceptance of the final report by the lead agency signifies completion of the program of mitigation for the project. Review and approval of the final report by a qualified professional paleontologist designated by the lead agency will determine the effectiveness of the program and adequacy of the report. Inadequate performances in either area comprise noncompliance, and may result in the lead agency removing the project paleontologist from its list of qualified professional paleontological consultants.

Definitions

A QUALIFIED PROFESSIONAL PALEONTOLOGIST (Principal Investigator, Project Paleontologist) is a practicing scientist who is recognized in the paleontological community as a professional and can demonstrate familiarity and proficiency with paleontology in a stratigraphic context. A paleontological Principal Investigator shall have the equivalent of the following qualifications:

1. A graduate degree in paleontology or geology, and/or a publication record in peer reviewed journals; and demonstrated competence in field techniques, preparation, identification, curation, and reporting in the state or geologic province in which the project occurs. An advanced degree is less important than demonstrated competence and regional experience.
2. At least two full years professional experience as assistant to a Project Paleontologist with administration and project management experience; supported by a list of projects and referral contacts.
3. Proficiency in recognizing fossils in the field and determining their significance.
4. Expertise in local geology, stratigraphy, and biostratigraphy.
5. Experience collecting vertebrate fossils in the field.

PALEONTOLOGICAL RESOURCE MONITORS shall have the equivalent of the following qualifications:

1. BS or BA degree in geology or paleontology and one year experience monitoring in the state or geologic province of the specific project. An associate degree and/or demonstrated experience showing ability to recognize fossils in a biostratigraphic context and recover vertebrate fossils in the field may be substituted for a degree. An undergraduate degree in geology or paleontology is preferable, but is less important than documented experience performing paleontological monitoring, or
2. AS or AA in geology, paleontology, or biology and demonstrated two years experience collecting and salvaging fossil materials in the state or geologic province of the specific project, or
3. Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in the state or geologic province of the specific project.

4. Monitors must demonstrate proficiency in recognizing various types of fossils, in collection methods, and in other paleontological field techniques.

ASSOCIATED CRITICAL DATA includes adequate field notes, sketches of stratigraphic sections, geologic maps, and site and specimen photos. Associated critical data may also include samples of organic carbon and volcanic ash for radiometric dating, oriented samples for paleomagnetic analysis, samples for microfossil analysis, and samples for determining the sediment source.

A **PALEONTOLOGICAL REPOSITORY** is a not-for-profit museum or university approved by the lead agency and employing a permanent curator responsible for paleontological records and specimens. Such an institution assigns accession, locality, and/or catalog numbers to individual specimens that are stored and conserved to ensure their preservation under adequate security against theft, loss, damage, fire, pests, and adverse climate conditions. Specimens will be stored in a stable environment away from flammable liquids, corrosive chemicals, organic materials subject to mildew, and sources of potential water damage. Specimens must have all modifications, preparation techniques, etc. documented and linked with the specimen. The repository will also archive lists of collected specimens, and any associated field notes, maps, photographs, diagrams, or other data. The repository must have procedures for tracking specimens removed from storage for study, preparation, exhibit, or loan. The repository must make its collections of cataloged specimens available for study by qualified researchers.

ARCHAEOLOGICAL RESOURCES are human remains and items or artifacts associated with human cultures. If paleontological resources are determined to be in close stratigraphic association with human remains or human manufactured items, or if fossils can be demonstrated to be intentionally modified by humans, they are also considered archaeological resources.

SIGNIFICANT PALEONTOLOGICAL RESOURCES are fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i. e., older than about 5,000 radiocarbon years).

A **LEAD AGENCY** is the agency responsible for addressing impacts to resources that a specific project might cause, and for ensuring compliance with approved mitigation measures.

PALEONTOLOGICAL POTENTIAL is the potential for the presence of significant paleontological resources. All sedimentary rocks, some volcanic rocks, and some low-grade metamorphic rocks have potential to yield significant paleontological resources. Paleontological potential is determined only after a field survey of a rock unit in conjunction with a review of available literature and relevant paleontological locality records.

LOCATION ANACAPA CA

Established Series
Rev. RE-RCH-GMK
02/2003

ANACAPA SERIES

The Anacapa series consists of deep, well drained soils that formed in alluvium derived from predominantly sedimentary rock sources. Anacapa soils are in flood plains and on alluvial fans and have slopes of 0 to 9 percent. The mean annual precipitation is about 15 inches and the mean annual air temperature is about 60 F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, thermic Calcic Pachic Haploxerolls

TYPICAL PEDON: Anacapa sandy loam, cultivated. (Colors are for dry soil unless otherwise noted.)

Ap--0 to 5 inches; grayish brown (2.5Y 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; neutral (pH 7.0); abrupt smooth boundary. (4 to 6 inches thick)

A12--5 to 24 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; neutral (pH 7.0); gradual smooth boundary. (10 to 20 inches thick)

A13--24 to 35 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; slightly alkaline (pH 7.5); clear smooth boundary. (7 to 15 inches thick)

Cca--35 to 60 inches; grayish brown (10YR 5/2) coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; violently effervescent with lime disseminated and in filaments; moderately alkaline (pH 8.0).

TYPE LOCATION: Ventura County, California; near Oxnard, California; approximately 2,640 feet west and 300 feet south of the intersection of Gonzales Road and Ventura Road.

RANGE IN CHARACTERISTICS: Depth to carbonates ranges from 20 to 40 inches. The lime is mostly disseminated but there area also filaments and other small soft lime segregations. Between depths of 10 and 40 inches clay averages less than 18 percent. Gravel ranges from 0 to 25 percent. The soils are moist in some part between depths of 8 and 24 inches slightly more than half the year and are continuously dry from mid-May to early November. Mean soil temperature is about 62 to 65 F.

The A horizon is grayish brown or dark grayish brown in 10YR or 2.5Y hue. It is sandy loam, fine sandy loam, or light loam. This horizon contains about 2 or 3 percent organic matter in the upper part and more than 1 percent at a depth of 20 inches, with a regular decrease with depth. It is usually slightly hard when dry and is not both massive and hard. The A horizon is neutral or mildly alkaline (usually pH 7.0 to 7.8) and is 21 to 41 inches thick.

The C horizon is light brownish gray, grayish brown, brown or pale brown in 10YR to 2.5Y hue. It is sandy loam or loam and may be strongly stratified below a depth of 40 inches.

COMPETING SERIES: These are the Elder, Mocho, Nord, Salinas, Sheridan, Soquel, Sorrento, and Vina series. Elder soils lack free lime. Nord soils are calcareous within a depth of 5 to 10 inches and have an irregular decrease in organic matter. Mocho, Sorrento, and Vina soils have 18 to 35 percent clay in the control section.

Salinas soils have more than 18 percent clay and chroma less than 2. Sheridan soils have slightly to moderately acid C horizons. Soquel soils lack lime and have a soil temperature below 59 F.

GEOGRAPHIC SETTING: Anacapa soils are on smooth flood plains and alluvial fans on gradients up to 9 percent and formed in alluvium from predominantly sedimentary rock sources. They occur at elevations from sea level to 1,000 feet in a subhumid mesothermal climate having warm dry summers and cool moist winters. The mean annual precipitation is 13 to 20 inches. Average January temperature is about 53 F, average July temperature is about 65 F, and mean annual temperature is about 60 F. The frost-free season is over 300 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Mocho and Sorrento soils and the Pacheco soils, all of which may occur on the same alluvial fan. Pacheco soils are in slightly depressed areas and have poor natural drainage.

DRAINAGE AND PERMEABILITY: Well drained; medium runoff; moderately rapid permeability.

USE AND VEGETATION: These soils are used primarily for row crops and citrus with an increasing importance for urban expansion. Natural vegetation was annual grasses and forbs.

DISTRIBUTION AND EXTENT: Coastal plains and valleys of south-central California. The soils are moderately extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis, California

SERIES ESTABLISHED: Ventura Area, California, 1972.

REMARKS: The activity class was added to the classification in January of 2003. Competing series were not checked at that time. - ET

Last revised by the state on 10/75.

National Cooperative Soil Survey
U.S.A.

Web Soil Survey

Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey.

Sign up for email updates on Web Soil Survey (https://public.govdelivery.com/accounts/USDAFARMERS/subscriber/new?topic_id=USDAFARMERS_4035)

The Web Soil Survey (WSS) provides agricultural producers, agencies, Technical Service Providers, and others electronic access to relevant soil and related information needed to make land-use and management decisions. The WSS:

- Provides an alternative to traditional hardcopy publication for quicker delivery of information,
- Provides access to full soil survey report content,
- Provides access to the most current data, and
- Provides customers with the ability to download spatial, tabular, and thematic soils data for use in GIS.

Using Web Soil Survey (a playlist of YouTube videos) **(https://www.youtube.com/playlist?list=PLKyiLObeuDlo_nzll8gosOWz3IujRzVck)**

Web Soil Survey

The Web Soil Survey provides agricultural producers, agencies, Technical Service Providers, and others online access to soil and related information needed to make land-use and management decisions.

START WEB SOIL SURVEY →

Web Soil Survey Help

Getting Started (#modal-10365)

Known Problems and Workarounds (#modal-10366)

Frequently Asked Questions (#modal-10367)

Tips and Shortcuts (#modal-10368)

Additional Documents

Defining an AOI for Web Soil Survey on a Mobile Device (/sites/default/files/2022-08/WSS-Defining-an-AOI-on-a-mobile-device_0.pdf) (3.52 MB)

Use Google Earth with Web Soil Survey (/sites/default/files/2022-08/WSS-Use-Google-Earth.pdf) (2.81 MB)

Using WSS - The Four Steps (/sites/default/files/2022-08/WSS-Four-Steps.pdf) (4.31 MB)

Guide to Maps, Reports, and Tables - alphabetical (/sites/default/files/2022-09/WSS_alphabetical_interpretations_v2.pdf) (315.14 KB)

Guide to Maps, Reports, and Tables - by category (/sites/default/files/2022-09/WSS__interpretations_by_category.pdf) (350.85 KB)

Version 3.3 Brochure (/sites/default/files/2022-08/WSS-brochure_1.pdf) (1.53 MB)

Print-At-Home Version 3.3 Brochure (/sites/default/files/2022-08/WSS-brochure-print-at-home.pdf) (1.56 MB)

Version 3.0 Brochure in Spanish (/sites/default/files/2022-08/WSS-brochure-spanish.pdf) (2.18 MB)

Factsheet (/sites/default/files/2022-08/WSS-factsheet.pdf) (1.22 MB)

National Commodity Crop Productivity Index 3.0 (NCCPI 3.0) User Guide (/sites/default/files/2023-01/NCCPI-User-Guide.pdf) (17.73 MB)

More Details

ANNUAL REFRESH OF SOIL SURVEY DATA

Information on the annual refresh of soils data.

LEARN MORE (/CONSERVATION-BASICS/NATURAL-RESOURCE-CONCERNS/SOILS/ANNUAL-REFRESH-OF-SOIL-SURVEY-DATA)

STATUS MAP OF AVAILABLE SOIL SURVEYS

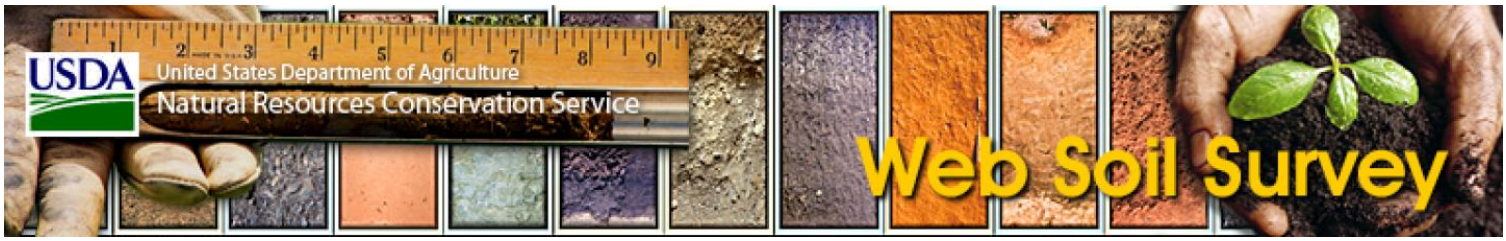
Availability of SSURGO data.

STATUS MAP (HTTPS://WEBSOILSURVEY.NRCS.USDA.GOV/DATAAVAILABILITY/SOILDATAAVAILABILITYMAP.PDF)

METRICS

Usage for popular Soils apps.

LINK TO METRICS (HTTPS://NEW.CLOUDVAULT.USDA.GOV/INDEX.PHP/S/KEIRFRGIDEF8KCK)



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Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the interactive fault map.

Ventura fault (Class A) No. 91

Last Review Date: 2002-02-19

Compiled in cooperation with the California Geological Survey

citation for this record: **Perry, S., and Bryant, W.A., compilers, 2002, Fault number 91, Ventura fault, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 05/15/2023 02:48 PM.**

Synopsis	Ventura fault is a north-dipping reverse-oblique slip fault that is expressed at the surface as a monocline with secondary normal faulting (Sarna-Wojcicki and others, 1976 #1316; Smith, 1976 #6030; Smith, 1978 #6031). Prentice and Powell (1991 #6025) reported evidence of steeply north-dipping faults between 4.5 and 9 m below the surface in borings; otherwise trench investigations done in compliance with California's Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 1997 #4856) have only exposed secondary normal faults related to monoclinal flexure. There is disagreement as to the seismogenic potential of the fault: Yeats (1982 #6032; 1982 #6033) suggests that the fault is a bending moment fault with no potential for large, damaging earthquakes; Sarna-Wojcicki and others (1976 #1316) and Sarna-Wojcicki and Yeats (1982 #6028) concluded that the Ventura and Pitas Point [180] faults do have the potential for producing damaging earthquakes. Clark and others (1984 #2876) reported late Pleistocene to Holocene dip-slip rate of 0.8-2.4 mm/yr, based on south-facing scarp observed by Sarna-Wojcicki and others (1976 #1316) across Harmon alluvial fan. Various studies (e.g., Sarna-Wojcicki and others, 1976 #1316; Yerkes and others, 1987 #6035; Yerkes and Lee, 1987 #6037; Dahlen, 1989 #6020) have presumed that the onshore Ventura fault is an extension of the offshore Pitas Point fault [180], because of their similar strike and inferred end points west of Ventura (Sarna-

	Wojcicki and others, 1976 #1316). In this compilation, the Ventura fault name is used for the onshore north-dipping reverse-oblique fault. The offshore Pitas Point fault [180] will be considered separately.
Name comments	Fault first suggested by Putnam (1942 #6026), who noted that terraces in the Ventura area were disrupted by several vertical and south-dipping high angle reverse faults. Ogle and Hacker (1969 #6023) show a north-dipping reverse fault along the south margin of the Ventura Avenue anticline. First named Ventura Foothills fault by Quick (1973 #6027) and Nichols (1974 #6022). Sarna-Wojcicki and others (1976 #1316), who provide the most detailed mapping of the fault, named the fault the Ventura fault and associated this onshore fault with the offshore Pitas Point fault [180]. Ziony and others (1985 #5931) refer to this fault zone as the Pitas Point-Ventura fault. The name Pitas Point fault [180] has also been assigned to the Ventura fault. **Fault ID:** Refers to number 336 (Ventura fault) of Jennings (1994 #2878) and number 55 (Pitas Point-Ventura fault) of Ziony and others (1985 #5931).
County(s) and State(s)	VENTURA COUNTY, CALIFORNIA
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Location of fault from Qt_flt_ver_3-0_Final_WGS84_polyline.shp (Bryant, W.A., written communication to K.Haller, August 15, 2017) attributed to 1:24,000-scale map by Smith (1976 #6030) augmented by 1:750000-scale map by Jennings (1994 #2878).
Geologic setting	The Ventura fault is a north-dipping reverse-oblique slip fault located in the western Transverse Ranges geomorphic province. The fault extends from the mouth of the Ventura River eastward to near the town of Saticoy. Some workers consider that the Ventura fault extends westward offshore and connects with the Pitas Point fault [180] (e.g., Sarna-Wojcicki and others, 1976 #1316; Yerkes and others, 1987 #6035). Total displacement along the Ventura fault is not well documented. Ogle and Hacker (1969 #6023) reported an apparent vertical separation of 245 m of the Pleistocene Las Posas Formation.
Length (km)	13 km.

Average strike	N89°W
Sense of movement	Reverse, Left lateral *Comments:* Ogle and Hacker (1969 #6023) reported a 245 m vertical separation of the base of the Pleistocene Los Posas Formation based on oil well data, although they associated this displacement with the Pitas Point fault [180]. Sarna-Wojcicki and others (1976 #1316) and Yerkes and others (1987 #6035) reported that fault is primarily reverse with a component of sinistral strike-slip displacement, based on geomorphic expression of the fault and selected focal plane solutions. Yerkes and others (1987 #6035) estimated 3:1 vertical to horizontal displacement components.
Dip	55°-65° N. *Comments:* Dip reported by Yerkes and others (1987 #6035).
Paleoseismology studies	There have been 28 site-specific investigations using trenching in compliance with the Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 1997 #4856). These studies principally have attempted to locate Holocene active traces of the Ventura fault. Specific paleoseismic investigations have not been attempted.
Geomorphic expression	The 10-km-long fault is delineated by a south-facing scarp on late Pleistocene and Holocene alluvium.
Age of faulted surficial deposits	Fault offsets early to mid-Pleistocene San Pedro Formation (Sarna-Wojcicki and others, 1976 #1316), 80-ka marine terrace deposits (Yerkes and others, 1987 #6035). Sarna-Wojcicki and others (1976 #1316) mapped Holocene Harmon Canyon alluvial fan as offset.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Timing of the most recent paleoevent is poorly constrained. Sarna-Wojcicki and others (1976 #1316) reported that Harmon Canyon alluvial fan is offset by the Ventura fault. Amino acid racemization ages of rodent bones recovered from 4 m depth below the fan surface range from 5,700 yr BP to 6,300

	yr BP (Sarna-Wojcicki and others, 1976 #1316). Clark and others (1984 #2876) estimated age range of 5.7 ka to 15 ka for alluvial fan surface, based on data from Sarna-Wojcicki and others (1976 #1316).
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* 0.4 mm/yr vertical component reported by Yerkes and others (1987 #6035); value is uplift rate in last 80 ka, based on interpretation of deformation in emergent marine terraces. Clark and others (1984 #2876) and Petersen and Wesnousky (1994 #6024) reported a dip-slip rate of 0.8-2.4 mm/yr, based on the maximum scarp height of 12-13.9 m (assuming fault dips 60? to 90?) reported for the fault (Sarna-Wojcicki and others, 1976 #1316) and an assumed age of 5.7-15 ka, the age range of the Harmon alluvial fan. However, Sarna-Wojcicki and others (1976 #1316) reported age of for the surface of the Harmon alluvial fan is 5.7-6.3 ka, based on amino acid racemization of rodent bones found about 4 m below the fan surface. Slip rate assigned by Petersen and others (1996 #4860) for probabilistic seismic hazard assessment for the State of California was 1.0 mm/yr (with minimum and maximum assigned slip rates of 0.5 mm/yr and 1.5 mm/yr, respectively).
Date and Compiler(s)	2002 Sue Perry, Southern California Earthquake Center/U.S. Geological Survey William A. Bryant, California Geological Survey
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Prepared in cooperation with the U.S. Geological Survey,
Southern California Areal Mapping Project

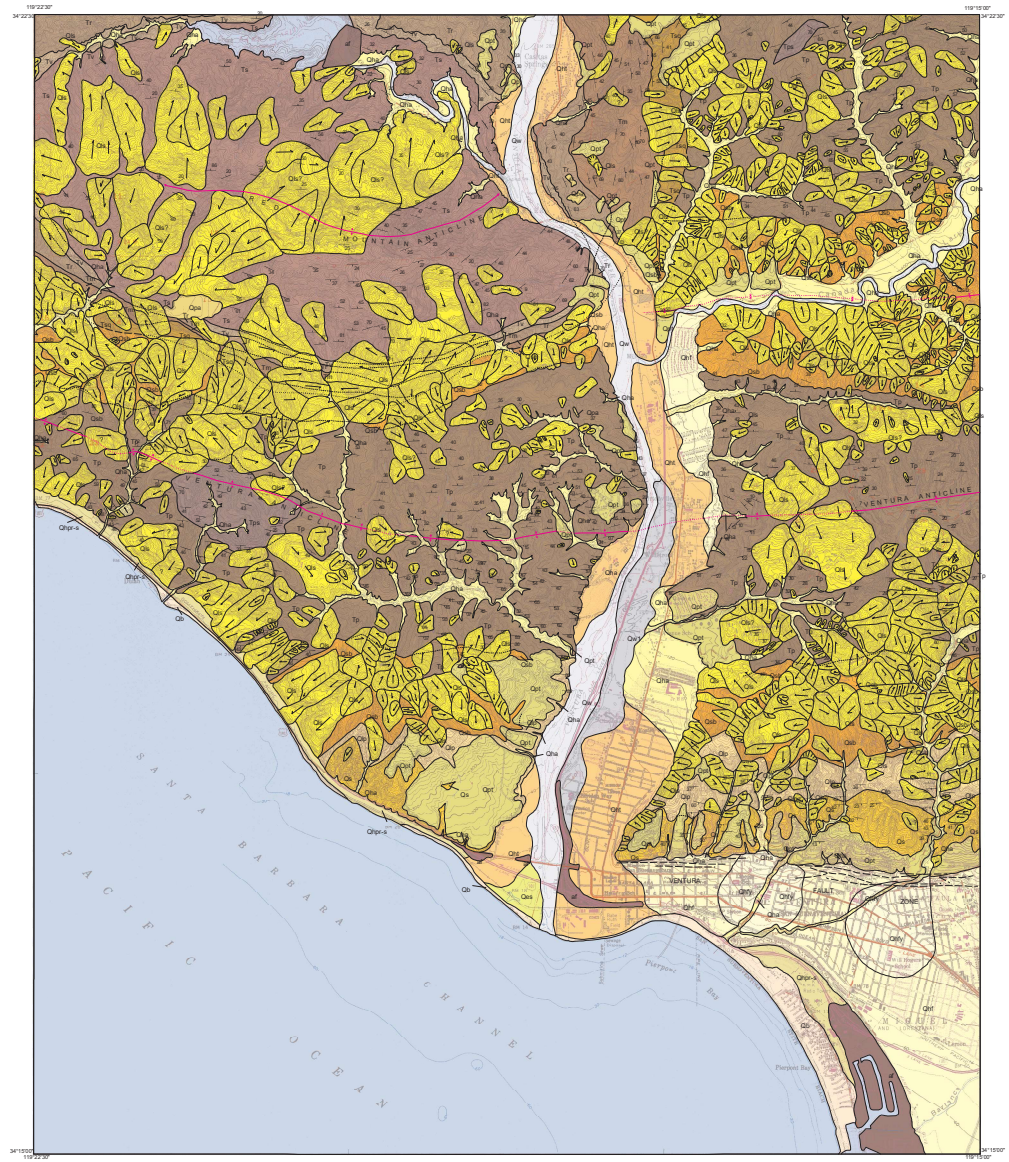
GEOLOGIC MAP OF THE VENTURA 7.5' QUADRANGLE VENTURA COUNTY, CALIFORNIA: A DIGITAL DATABASE

VERSION 1.0

By
Siang S. Tan[1], Terry A. Jones[1] and Kevin B. Clahan[2]

Digital Database by:
Kelly Corrlea[3]
2003

1. California Geological Survey, Los Angeles, CA
2. California Geological Survey, San Francisco, CA
3. U.S. Geological Survey, Riverside, CA



Topographic base from the U.S. Geological Survey. Polyconic Projection.

UTM GRID AND 1997 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

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This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program, Statemap Award no.02HQAG0018

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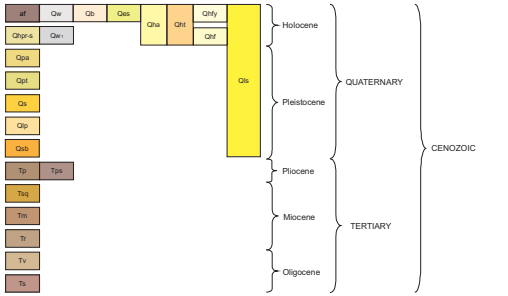

MAP SYMBOLS

- Contact between map units; generally approximately located or inferred; dotted where concealed.
- Fault; approximately located or inferred, quarried where location is uncertain; dotted where concealed.
- Landslide; arrow indicates principal direction of movement, quarried where existence is questionable (some geologic features are drawn within questionable landslides); hachured where headscarp is mappable.
- Strike and dip of bedding.
- Axis of anticline; dotted where concealed; arrow indicates direction of plunge.
- Axis of syncline; dotted where concealed.

EXPLANATION OF MAP UNITS

- af — Artifical fill material; may be engineered and/or non-engineered.
- Qw — Active wash deposits within major river channels; composed of unconsolidated sand, gravel and silt.
- Qb — Active beach deposits; consist mainly of loose sand, fine to coarse-grained.
- Qes — Active coastal estuarine deposits; composed of saturated silty clay with some fine sand.
- Qhfy — Latest Holocene alluvial fan deposits, deposited by streams emanating from mountain canyons onto alluvial valley floors; deposits originate as debris flows, hyperconcentrated mudflows, or braided stream flows; composed of moderately to poorly sorted, and moderately to poorly bedded sandy clay with some gravel.
- Qw1 — Historically active wash deposits adjacent to active channel; composed of unconsolidated sand, silt and gravel.
- Qha — Undivided Holocene alluvial and colluvial deposits on the floors of valleys, includes active stream deposits in hill slope areas; composed of unconsolidated sandy clay with some gravel.
- Qht — Holocene stream terrace deposits, deposited in point bar and overbank settings; composed of unconsolidated clayey sand and sandy clay with gravel.
- Qhf — Holocene alluvial fan deposits; deposited by streams emanating from mountain canyons onto alluvial valley floors; deposits originate as debris flows, hyperconcentrated mudflows, or braided stream flows; composed of moderately to poorly sorted, and moderately to poorly bedded, sandy clay with some gravel.
- Qls — Holocene to Pleistocene landslide deposits, include numerous active landslides; composed of weathered broken up rocks; extremely susceptible to renewed landsliding.
- Qhpr-s — Holocene paralic deposits of the Sea Cliff marine terrace 1800 to 5800 years old (Lajoie, and others, 1982); composed of semi-consolidated sandy clay with some gravel.
- Qpt — Undivided Pleistocene stream terrace deposits, consists of consolidated clay sand, gravel, cobble and some boulder size material.
- Qpa — Pleistocene undivided alluvial deposits, consist of consolidated silt, sand, clay, and gravel.
- Qs — Pleistocene Saugus Formation; weakly consolidated alluvial deposits composed of sandstone and siliceous shale gravel and cobbles in sandy matrix; highly susceptible to landsliding.
- Qlp — Pleistocene Las Posas Sandstone; weakly indurated sand, with some gravelly sand units; highly susceptible to landsliding.
- Qsb — Pleistocene Santa Barbara claystone; locally contains Monterey Formation shale fragments; highly susceptible to landsliding.
- Tp — Pliocene undivided Pico Formation, composed of claystone, siltstone, sandstone, locally pebbly; generally susceptible to landsliding.
- Tps — Pliocene Pico Formation portion containing sandstone; generally resistant to landsliding.
- Tsq — Pliocene-Miocene Sisquoc Shale; silty shale and claystone; generally susceptible to landsliding
- Tm — Miocene Monterey Formation; consists of siliceous and diatomaceous shale and some sandstone and limestone; generally susceptible to landsliding.
- Tr — Miocene Rincon Shale; composed of shale and siltstone; generally susceptible to landsliding.
- Tv — Early Miocene Vaqueros Sandstone; consists of sandstone, locally calcareous
- Ts — Oligocene Sespe Formation, composed of sandstone; locally pebbly, with some siltstone and claystone.

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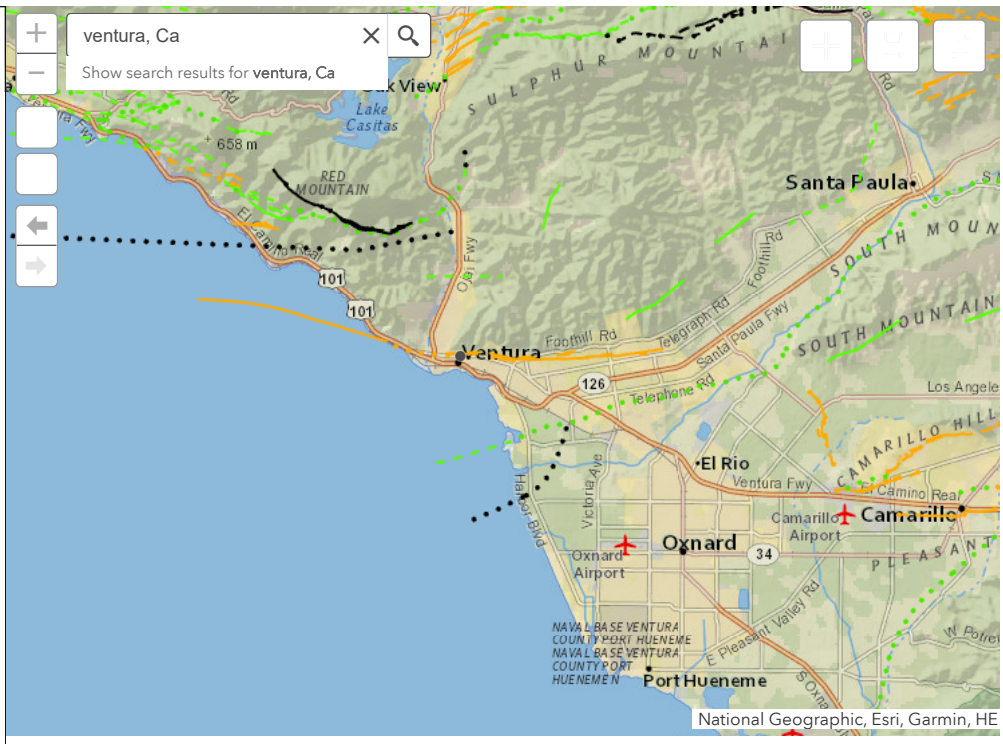
Legend

Qfaults

National Database

- Historic (< 150 years), well constrained location
- Historic (< 150 years), moderately constrained location
- Historic (< 150 years), inferred location
- Latest Quaternary (<15,000 years), well constrained location
- Latest Quaternary (<15,000 years), moderately constrained location
- Latest Quaternary (<15,000 years), inferred location
- Late Quaternary (< 130,000 years), well constrained location
- Late Quaternary (< 130,000 years), moderately contrained location
- Late Quaternary (< 130,000 years), inferred location
- Middle and late Quaternary (< 750,000 years), well constrained location
- Middle and late Quaternary (< 750,000 years), moderately constrained location
- Middle and late Quaternary (< 750,000 years), inferred location
- Undifferentiated Quaternary (< 1.6 million



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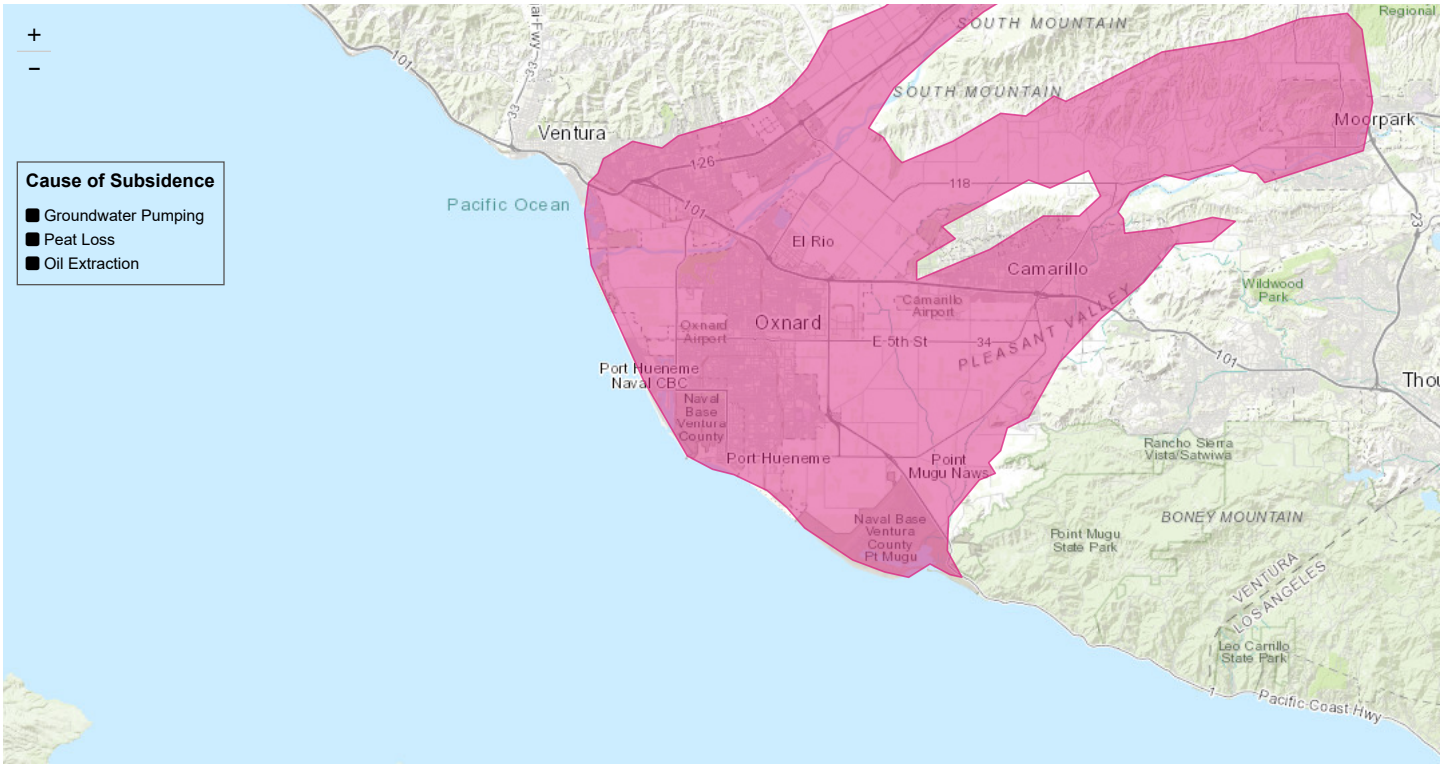
Land Subsidence in California (https://www.usgs.gov/centers/ca-water-ls/)

Areas of Land Subsidence in California

In California, large areas of land subsidence were first documented by USGS scientists in the first half of the 20th century. Most of this subsidence was a result of excessive groundwater pumping. Completion of California's State and Federal water projects that bring water from California's wet north to its dry south allowed some groundwater aquifers to recover, and subsidence decreased in these areas. However, subsidence continues today, sometimes at nearly historically high rates of more than 1 foot/year (ft/yr) (/projects/central-valley/land-subsidence-san-joaquin-valley.html). The map below illustrates areas of recorded subsidence—historical and current—across California.



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Groundwater Sustainability Indicators

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Groundwater-Storage Reductions (/sustainable-groundwater-management/groundwater-storage-california.html)

Seawater Intrusion (/sustainable-groundwater-management/seawater-intrusion-california.html)

Water-Quality Degradation (/sustainable-groundwater-management/water-quality-california.html)

Land Subsidence (/sustainable-groundwater-management/land-subsidence-california.html)

Interconnected Surface-Water Depletions (/sustainable-groundwater-management/interconnected-surface-water-depletion.html)

Subsidence Studies

San Joaquin Valley (/projects/central-valley/land-subsidence-san-joaquin-valley.html)

Coachella Valley (coachella-valley-subsidence.html)

Mojave Desert (/mojave/subsidence.html)

Sacramento-San Joaquin Delta (bay-delta-subsidence.html)

Santa Clara Valley (santa-clara-valley-subsidence.html)

Data Downloads

Subsidence: Interferometric Synthetic Aperture Radar (InSAR) (central-valley_insar-timeseries.xlsx)

Subsidence: Continuous GPS (CGPS) (http://www.unavco.org/instrumentation/networks/status/pbo)

Compaction: Extensometers (central-valley_extensometer-data.xlsx)

Benchmark Sites (http://www.restoresjr.net/monitoring-data/subsidence-monitoring/)

Groundwater Levels (http://nwis.waterdata.usgs.gov/ca/nwis/gwlevels)

Popular Publications

Glossary of selected terms useful in studies of the mechanics of aquifer systems and land subsidence due to fluid withdrawal (http://pubs.usgs.gov/wsp/2025/report.pdf)
USGS Water Supply Paper 2025

Groundwater Availability of the Central Valley Aquifer, California (https://pubs.er.usgs.gov/publication/pp1766)
USGS Professional Paper 1766

Guidebook to studies of land subsidence due to ground-water withdrawal (http://wwwrcamnl.wr.usgs.gov/rgws/Unesco/)
Prepared for the International Hydrological Programme, Working Group 8.4

Land Subsidence along the Delta-Mendota Canal in the northern part of the San Joaquin Valley, California, 2003-10 (http://pubs.usgs.gov/sir/2013/5142/)
USGS Scientific Investigations Report 2013-5142

Land Subsidence from Groundwater Use in California (land-subsidence-groundwater-use-california.pdf)
Report of Findings, 2014

Land subsidence in the San Joaquin Valley, California, USA, 2007-2014 (http://www.proc-iahs.net/372/23/2015/piahs-372-23-2015.html)
Proceedings of the International Association of Hydrological Sciences

Land Subsidence in the United States (http://pubs.usgs.gov/circ/circ1182/)
USGS Circular 1182

Land Subsidence in the United States (http://water.usgs.gov/ogw/pubs/fs00165/SubsidenceFS.v7.PDF)
USGS Fact Sheet-165-00

Measuring Land Subsidence from Space (http://pubs.usgs.gov/fs/fs-051-00/pdf/fs-051-00.pdf)
USGS Fact Sheet-051-00

- GitHub (https://github.com/usgs)
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