4

Required Elements

Designing Healthy, Equitable, Resilient, and Economically Vibrant Places

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"A city (or county) is not an accident but the result of coherent visions and aims."

—Leon Krier, ***The Architecture of Community***

Quick Links to Individual Elements

Land Use

Circulation

Housing

Conservation

Open Space

Noise

Safety

Environmental Justice

Air Quality

Introduction

All statutory references are to the California Government Code unless otherwise noted.

While a general plan will contain the community vision for future growth, California law also requires each plan to address the mandated elements listed in Government Code section 65302. The mandatory elements for all jurisdictions are land use, circulation, housing, conservation, open space, noise, and safety. Cities and counties in the San Joaquin Air Pollution Control District must also address air quality in their general plans. Cities and counties that have identified disadvantaged communities must also address environmental justice in their general plans, including air quality. The purpose of the following sections is to outline the content of each element as required by statute.

Relationships Among Elements and Issues

This chapter presents each of the mandatory elements separately. There is no requirement that a general plan be organized into separate elements, however, and planners should consider local context in general plan preparation. A jurisdiction may organize its

general plan in any format, including consolidated elements, so long as all of the relevant statutory issues are addressed (Gov. Code § 65301; Kings County Farm Bureau v. City of Hanford (1990) 221 Cal.App.3d 692). The elements and issues should form an integrated, internally consistent plan, and inconsistencies cannot be remedied by a statement giving one element precedence over the others (Gov. Code § 65300.5; Sierra Club v. Board of Supervisors of Kern County (1981) 126 Cal.App.3d 698). A concise general plan can avoid repetitive discussions of topics by consolidating the statutory requirements into a few functional elements. When revising a single element, local agencies should examine and, if necessary, revise the other elements, including optional elements, to avoid internal inconsistencies. The statutory elements call for interrelated content. For example, consideration given in the conservation element to the vegetation that supports an endangered wildlife species also involves analyzing topography, weather, fire hazards, availability of water, and density of development—issues which arise in other elements as well. The table on the following page illustrates the potential relationships among the mandatory elements and the issues addressed in a general plan. Not every general plan will address these issues to the same extent or in the same manner. Cities and counties should design their general plan format to suit the topographic, geologic, climatologic, political, socioeconomic, cultural, and historical diversity of their community. Each section in this GPG document will also highlight the relationships between the elements.

Topics, Elements	Land Use	Circulation	Housing	Conservation	Open Space	Noise	Safety	Environmental Justice
Agriculture	IN STATUTE	-	IN STATUTE	RELATED	IN STATUTE	-	RELATED	RELATED
Air Quality	RELATED	RELATED	RELATED	-	RELATED	-	RELATED	IN STATUTE
Airports	RELATED	IN STATUTE	RELATED	-	RELATED	IN STATUTE	RELATED	RELATED
Bicycle and Pedestrian Routes	RELATED	IN STATUTE	RELATED	-	-	-	RELATED	RELATED
Climate Change (Adaptation)	RELATED	RELATED	RELATED	RELATED	RELATED	-	RELATED	RELATED
Climate Change (GHG Emissions)	RELATED	RELATED	RELATED	RELATED	RELATED	-	RELATED	RELATED
Density	IN STATUTE	RELATED	IN STATUTE	-	-	-	RELATED	RELATED
Education	IN STATUTE	RELATED	RELATED	-	-	-	RELATED	RELATED
Social Equity	RELATED	RELATED	RELATED	RELATED	RELATED	RELATED	RELATED	RELATED
Environmental Justice	RELATED	RELATED	IN STATUTE	-	-	-	RELATED	IN STATUTE
Fire	RELATED	-	IN STATUTE	-	IN STATUTE	-	IN STATUTE	RELATED
Fisheries	RELATED	-	-	IN STATUTE	IN STATUTE	RELATED	RELATED	RELATED
Flooding	IN STATUTE	RELATED	IN STATUTE	IN STATUTE	-	-	IN STATUTE	RELATED
Food Access	RELATED	RELATED	RELATED	-	-	-	RELATED	IN STATUTE
Forests/Timber	IN STATUTE	RELATED	-	IN STATUTE	IN STATUTE	-	RELATED	RELATED
Health	RELATED	RELATED	RELATED	RELATED	RELATED	RELATED	RELATED	IN STATUTE
Housing	IN STATUTE	RELATED	IN STATUTE	RELATED	RELATED	RELATED	RELATED	IN STATUTE
Industrial Uses	IN STATUTE	RELATED	RELATED	-	-	IN STATUTE	RELATED	IN STATUTE
Land Reclamation	-	-	-	IN STATUTE	-	-	RELATED	RELATED
Land Use	IN STATUTE	IN STATUTE	IN STATUTE	IN STATUTE	RELATED	IN STATUTE	IN STATUTE	RELATED

■ Identified in statute ■ Closely related to statutory requirements

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Topics, Elements	Land Use	Circulation	Housing	Conservation	Open Space	Noise	Safety	Environmental Justice
Military Compatibility	IN STATUTE	RELATED	RELATED	RELATED	RELATED	RELATED	RELATED	RELATED
Minerals	RELATED	RELATED	-	IN STATUTE	IN STATUTE	-	RELATED	RELATED
Noise Contours	RELATED	IN STATUTE	RELATED	-	-	IN STATUTE	-	RELATED
Public Buildings	IN STATUTE	RELATED	RELATED	RELATED	RELATED	RELATED	IN STATUTE	RELATED
Railways and Yards	RELATED	IN STATUTE	RELATED	-	-	IN STATUTE	RELATED	RELATED
Recreation	IN STATUTE	RELATED	-	RELATED	IN STATUTE	-	RELATED	IN STATUTE
Scenic Resources	IN STATUTE	RELATED	RELATED	RELATED	IN STATUTE	RELATED	-	RELATED
School Siting	IN STATUTE	RELATED	RELATED	-	RELATED	RELATED	IN STATUTE	RELATED
Seismic Hazards	RELATED	RELATED	RELATED	RELATED	IN STATUTE	-	IN STATUTE	RELATED
Soil Conservation	RELATED	RELATED	RELATED	IN STATUTE	IN STATUTE	-	-	RELATED
Soil Instability	RELATED	RELATED	RELATED	-	-	-	IN STATUTE	RELATED
Transportation Routes	RELATED	IN STATUTE	IN STATUTE	RELATED	IN STATUTE	IN STATUTE	IN STATUTE	RELATED
Transportation Terminals	RELATED	IN STATUTE		IN STATUTE	-	RELATED	RELATED	RELATED
Utilities/ Easements	RELATED	IN STATUTE	RELATED	RELATED	IN STATUTE	RELATED	RELATED	RELATED
Waste Facilities	IN STATUTE	RELATED	IN STATUTE	-	-	RELATED	RELATED	RELATED
Water Quality	RELATED	-	-	IN STATUTE	IN STATUTE	-	RELATED	RELATED
Water Supply	RELATED	-	IN STATUTE	IN STATUTE	IN STATUTE	-	IN STATUTE	RELATED
Watersheds	RELATED	-	RELATED	IN STATUTE	IN STATUTE	-	RELATED	-
Waterways/Water Bodies	RELATED	-	RELATED	IN STATUTE	IN STATUTE	RELATED	RELATED	-
Wildlife	RELATED	RELATED	RELATED	IN STATUTE	IN STATUTE	-	-	-

■ Identified in statute ■ Closely related to statutory requirements

Regardless of which format a general plan takes, the content must form an integrated, internally consistent plan (*Sierra Club v. Board of Supervisors of Kern County* (1981) 126 Cal.App.3d 698).

Mandatory Element Format

The Government Code requires OPR to "develop and adopt guidelines for the preparation of and the content of the mandatory elements required in city and county general plans" (Gov. Code § 65040.2). According to the Government Code, the guidelines shall be "advisory to each city and county in order to provide assistance in preparing and maintaining their respective general plans" (Gov. Code § 65040.2(c)).

These Guidelines present the statutory elements in the order that they appear in Government Code section 65302. This order should not be construed as a ranking of importance or the order in which a jurisdiction should prepare elements. Elements can be prepared in any order or combined, as discussed in.

For a glossary of terms and a description of the parts of a general plan, see Appendix E.

4

Land Use Element

Introduction

The most fundamental decisions in planning begin with land use: what to put where. Land use planning envisions the future of a city or county and interacts with all other elements of planning. At its best, the land use element will reflect the community's vision; promote thoughtful, equitable, and accessible distribution of different land uses, including residential, commercial, industrial, agricultural, and open space; and align well with other general plan elements. Planners can also use the land use element as a tool to improve public health, reduce infrastructure costs, enhance local economies, and address long-term environmental issues such as climate change and water resources.

The land use element can also help resolve conflicts and identify trade-offs in land use decisions. For example, increasing density may result in a higher population, but it can also help enhance water supply reliability, reduce long-term costs of infrastructure maintenance, improve water use efficiency, land conservation, housing and transit options, and equity. Designating "least-conflict" areas for solar development may increase energy independence and generate local economic benefits while also preserving valuable agricultural lands. Pursuing urban infill projects may require higher intensity development directed at a limited number of parcels varying in suitability, but infill may also allow for more accessible transit and walkability thus reducing vehicle miles traveled and subsequent greenhouse gas emissions. Identifying and resolving such issues in the land use element can result in development patterns that are predictable, coherent, and reflect community values.

Gov. Code § 65302 (a) A land use element that designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, greenways as defined in Section 816.52 of the Civil Code and other categories of public and private uses of land. The location and designation of the extent of the uses of the land for public and private uses shall consider the identification of land and natural resources pursuant to paragraph (3) of subdivision (d). The land use element shall include a statement of the standards of population density and building intensity recommended for the various districts and other territory covered by the plan. The land use element shall identify and annually review those areas covered by the plan that are subject to flooding identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources. The land use element shall also do both of the following:

(1) Designate in a land use category that provides for timber production those parcels of real property zoned for timberland production pursuant to the California Timberland Productivity Act of 1982 (Chapter 6.7 (commencing with Section 51100) of Part 1 of Division 1 of Title 5).

(2) Consider the impact of new growth on military readiness activities carried out on military bases, installations, and operating and training areas, when proposing zoning ordinances or designating land uses covered by the general plan for land, or other territory adjacent to military facilities, or underlying designated military aviation routes and airspace.

(A) In determining the impact of new growth on military readiness activities, information provided by military facilities shall be considered. Cities and counties shall address military impacts based on information from the military and other sources.

(B) The following definitions govern this paragraph:

(i) "Military readiness activities" mean all of the following:

(I) Training, support, and operations that prepare the men and women of the military for combat.

(II) Operation, maintenance, and security of any military installation.

(III) Testing of military equipment, vehicles, weapons, and sensors for proper operation or suitability for combat use.

(ii) "Military installation" means a base, camp, post, station, yard, center, homeport facility for any ship, or other activity under the jurisdiction of the United States Department of Defense as defined in paragraph (1) of subsection (g) of Section 2687 of Title 10 of the United States Code.

In this way, the land use element functions as a guide to planners, the general public, and decision makers. Its objectives, policies, and programs relate directly to the other elements. In practice, the land use element is often the most visible and frequently used element in a general plan.

CORRELATIONS AMONG ELEMENTS

	Circulation	Housing	Conservation	Open Space	Noise	Safety	EJ
Land Use	IN STATUTE	IN STATUTE	IN STATUTE	RELATED	IN STATUTE	IN STATUTE	RELATED

■ Identified in statute ■ Closely related to statutory requirements

Completeness Checklist

Local agency staff can use the following checklist to help ensure that the land use element addresses all required issues. Please note that use of this checklist is purely advisory, and only contains issues that are legally required in Government Code section 65302(a). Conservation elements may address additional issues at the discretion of the local government. Because general plan formats may vary, this checklist suggests identifying where the particular government code provision is satisfied.

California Government Code Section	Brief Description of Requirement
§ 65302(a)	General distribution, location, and extent of:
§ 65302(a)	Housing Density and intensity Potential for flooding impacts.
§ 65302(a)	Business Density and intensity Potential for flood?
§ 65302(a)	Industry Density and intensity Potential for flood?
§ 65302(a)	Open space, including agriculture, natural resources, recreation, and scenic resources Potential for flood?
§ 65302(a)	Education Density and intensity Potential for flood?
§ 65302(a)	Public facilities Density and intensity Potential for flood?
§ 65302(a)	Solid and liquid waste disposal Density and intensity Potential for flood?
§ 65302(a)(1)	Timberland Production Intensity Potential for flood?
§ 65302(a)	Other Density and intensity Potential for flood?
§ 65302(a)	Greenways, as defined in Civil Code Section 816.52
§ 65302(a)	Identify areas subject to flood plain mapping Annual review
§ 65302(a)(2)	Impact on military land use compatibility and readiness
§ 65302(b)(1)	Correlation with the circulation element

4

Required Contents

Government Code section 65302(a) describes the required content of a land use element. Specifically, the land use element must designate the proposed general distribution, general location, and extent of land uses for

- Housing, business, and industry
- Open space, including agricultural land, watersheds, natural resources, and recreation
- Recreation facilities and opportunities
- Educational facilities
- Public buildings and grounds
- Future solid and liquid waste facilities
- Greenways
- Timberland Preserve Zone lands
- Areas subject to flooding, identified by either flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources or mapped flood areas adopted by the local community on Flood Insurance Rate Maps
- Military land use compatibility and impacts to military readiness
- Other categories of public and private uses of land, such as marine protected areas

The land use element should contain a sufficient number of land use categories to conveniently classify the various uses identified by the plan. Land use categories should be descriptive enough to distinguish between allowable levels of intensity and allowable uses. The element should include categories reflecting existing land uses as well as projected development. Additionally, the land use element must include "a statement of the standards of population density and building intensity recommended for the various districts and other territory covered by the plan" (*Camp v. County of Mendocino Board of Supervisors* (1981) 123 Cal. App.3d 334). There need not be an equal number of land use designations and zoning classifications. In many cases, there may be more than one zone that would be consistent with each land use designation.

The land use element must accommodate specific land uses identified in the conservation element pursuant to Government Code section 65302(g)(d)(3). The land use plan must identify waterways used in flood management and could also identify groundwater recharge areas.

The land use element must also consider the impact of new development on military readiness activities carried out on military bases, installations, and in operating and training areas. Planners must take such impacts into account when proposing zoning ordinances or designating land uses covered by the general plan for land that is either adjacent to military facilities or underlying designated military aviation routes and airspace (Gov. Code § 65302(a)(2)). For a GIS map of military aviation routes and airspace by

local government boundary, see the California Military Land Use Compatibility Analyst. For more information on community and military compatibility planning, see the supplement to the general plan guidelines.

The land use element must also be consistent with airport land use compatibility plans where applicable (Gov. Code § 65302.3). For more information on airport land use compatibility and requirements, see the California Airport Land Use Planning Handbook.

The land use element must reflect the specific contents from other elements. For example, the land use element must account for "rivers, creeks, streams, flood corridors, riparian habitats, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management," as identified in the conservation element (Gov. Code § 65302(d)(3)). The law also requires the land use element to correlate with the circulation element (Gov. Code § 65302(b)); and to use the noise element (Gov. Code § 65302(f)) as a guide for establishing a pattern of land use that minimizes the exposure of community residents to excessive noise. For more detailed discussions of those requirements, see the circulation, conservation, and noise elements.

As explained later in this chapter, in some circumstances the land use element must also identify disadvantaged communities and plan for infrastructure in those communities.

Density and Intensity

California's population continues to grow, and the general plan presents a platform to prepare for future needs. Jurisdictions must plan to accommodate the share of the regional housing need that is allocated to them by their Council of Governments (Gov. Code § 65584 (b)). In doing so, planners should consider several factors in their forecasts and build-out scenarios, including population growth and trends, community and regional demographics, the local mix of jobs and housing, economic trends, and infrastructure needs. The Demographic Research Unit within the California Department of Finance (DOF) prepares annual population estimates for the state and for individual counties and cities. This unit also produces information on housing units, vacancies, average household size, components of population change, and special populations. More broadly, the Department of Finance forecasts both population and public school enrollment for the state and for each county for 50 years into the future. DOF data are used to comply with various state codes, including the Regional Housing Needs Assessment (RHNA) process, and for research and planning purposes by federal, state, and local agencies, the academic community, and the private sector.

"Population density" refers to the "numbers of people in a given area and not to dwelling units per acre, unless the basis for correlation between the measure of dwelling units per acre and numbers of people is set forth explicitly in the plan" (*Twain Harte Homeowners Association v. County of Tuolumne* (1982) 138 Cal.App.3d 664). Quantifiable standards of population density must be provided for each of the land use categories contained in the plan. Population density standards need not be restricted solely to land use designations with residential development potential. As the court stated in Twain Harte, "it would not be unreasonable to interpret the term 'population density' as relating not only to residential density, but also to uses of nonresidential land categories and as requiring an analysis of use patterns for all categories . . . it appears sensible to allow local governments to determine whether the statement of population standards is to be tied to residency or, more ambitiously, to the daily usage [sic] estimates for each land classification." Although applied differently from one jurisdiction to another, residential population density can best be expressed as the relationship between two factors: the number of dwellings per acre and the number of residents per dwelling.

Camp v. Mendocino County Board of Supervisors (1981) 123 Cal.App.3d 334 also held that, in addition to assigning different uses to different areas, an adequate general plan must also contain standards for building intensity.

Considerations for defining building intensity can include, but are not limited to:

- Intensity should be defined for each of the various land use categories in the plan.
- General use captions such as "neighborhood commercial" and "service industrial" may be insufficient measures of intensity by themselves.
- Building intensity is not synonymous with population density.

Intensity will be dependent upon the local plan's context and may be based upon a combination of quantifiable variables:

- Many jurisdictions prescribe minimum and maximum numbers of dwelling units per acre as a useful residential standard.
- Floor Area Ratio (FAR), which represents the ratio of the area of a building's floor to that of its total site, is a common measure of commercial and industrial intensity.
- A dual standard of maximum lot coverage and maximum building height may be suitable for agricultural and open-space areas, as well as recreational areas with development limits.
- Lot size has been widely used for agricultural and open-space designations, but it may be an inadequate standard for building intensity.

Coordinating land use and transportation can revitalize underused spaces

Image by Urban Advantage, Community Design + Architecture

Intensity standards can also include provisions for flexibility, such as density bonuses, cluster zoning, and planned unit developments. Standards for permitted uses and building types qualitatively determine the uses that will be allowable in each land use designation.

Many communities have chosen to incorporate form-based codes into their plans, regulating building and infrastructure forms in addition to—or in place of—uses. Form-based codes focus on the community's vision for the physical characteristics of a community, in addition to the statutory requirements presented in law. Government Code section 65302.4 permits form-based codes in general plans, stating that "[t]he text and diagrams in the land

use element that address the location and extent of land uses, and the zoning ordinances that implement these provisions, may also express community intentions regarding urban form and design. These expressions may differentiate neighborhoods, districts, and corridors, provide for a mixture of land uses and housing types within each, and provide specific measures for regulating relationships between buildings, and between buildings and outdoor public areas, including streets." This tool achieves certainty over the physical outcome of land use and development decisions while enhancing flexibility to create more infill or infrastructure as needed. Cities in California that have used form-based codes, such as Ventura, Benicia, and Petaluma, provide examples of this practice.

As defined by the National Center, development capacity analysis, sometimes called 'build-out analysis' represents "an estimate of the total amount of development that may be built in an area under a certain set of assumptions, including applicable land use laws and policies (e.g., zoning), environmental constraints, etc." Calculating the acreage within each land use category and multiplying that number by the applicable density and intensity factor estimate theoretical development capacity. Realistic development capacity involves analysis of growth forecasts and other factors, including inhibitions to development. The referenced report by the National Center for Smart Growth Research and Education, Maryland Department of Planning, and Lincoln Institute of Land Policy recommends a five-step process for capacity analysis based on best practices from Oregon, Maryland, and Washington:

i. "Identify vacant land and those lands that cannot be developed due to environmental constraints.

ii. Subtract land needed for urban public services.

iii. Add land that can be redeveloped or developed at greater intensity through infill.

iv. Identify land with public services.

v. Estimate development capacity."

An analysis should include a discussion of the realistic capacity of lands by zoning district, as related to housing and other development. Specifically, the element should demonstrate the ability to achieve the densities assumed in the land inventory either through a discussion of past development trends by zoning district or through city regulations, policies or programs requiring the assumed densities. Assumed densities should not include density bonuses. In communities with limited vacant land, the land inventory should identify and analyze sites with redevelopment potential for new and more intensive residential development. In such cases, the land inventory should describe the acreage, zoning and development standards, existing uses and ripeness for redevelopment, realistic development capacity, the general character and size of sites judged suitable for residential development, market trends, and any policies or incentives to facilitate their development. The inventory should estimate the realistic development capacity based on an analysis of these factors. Such sites may be made available by implementing programs applicable to redevelopment, including recycling, infill, re-designation, and rezoning of nonresidential sites for appropriate residential use.

4

Statutory Requirements

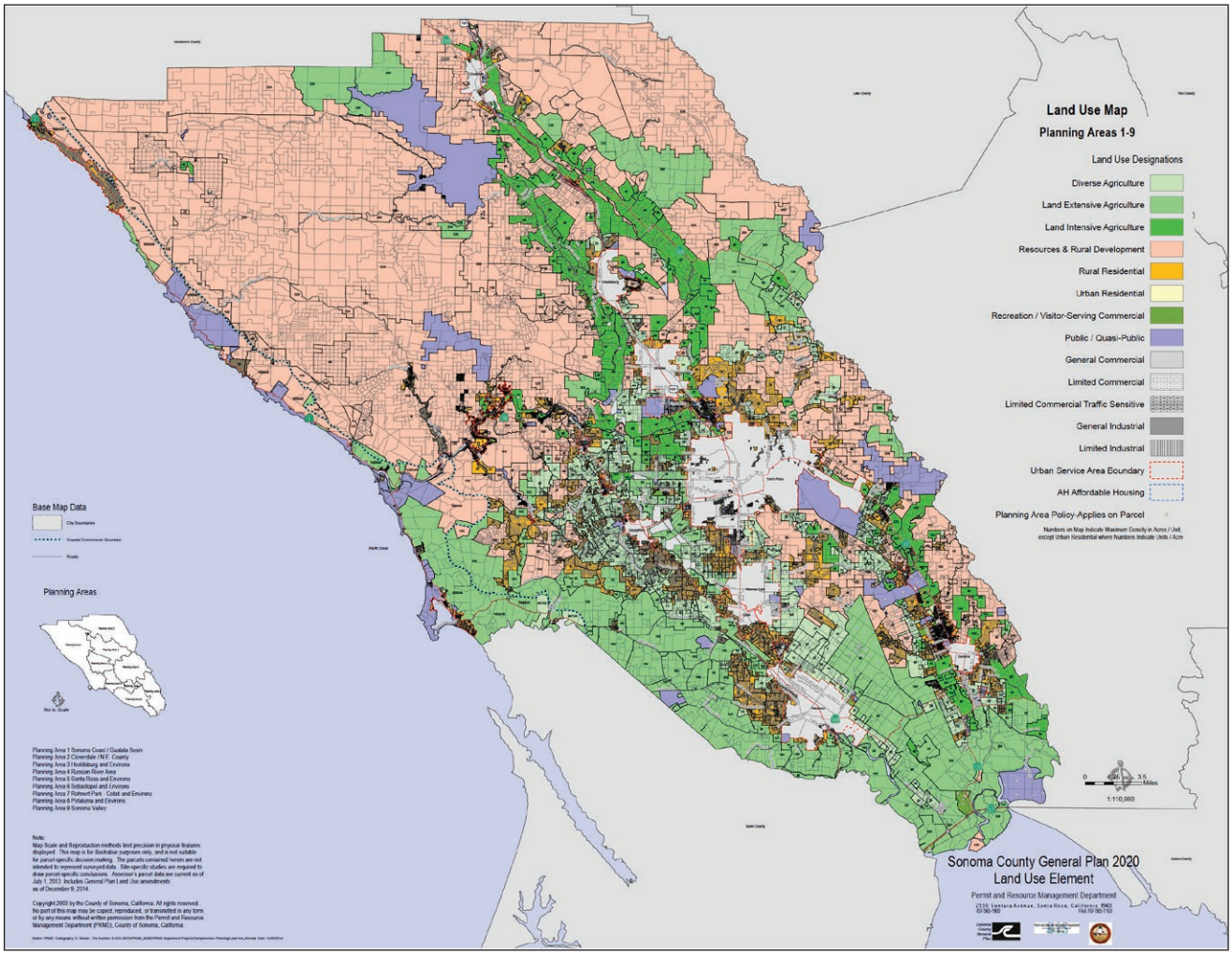
This section offers a general guide to the contents of the land use element. Note that while the focus is on the minimum requirements for an adequate land use element, an effective general plan will also focus on the issues of greatest relevance to the community.

Diagram

Requirement Description:

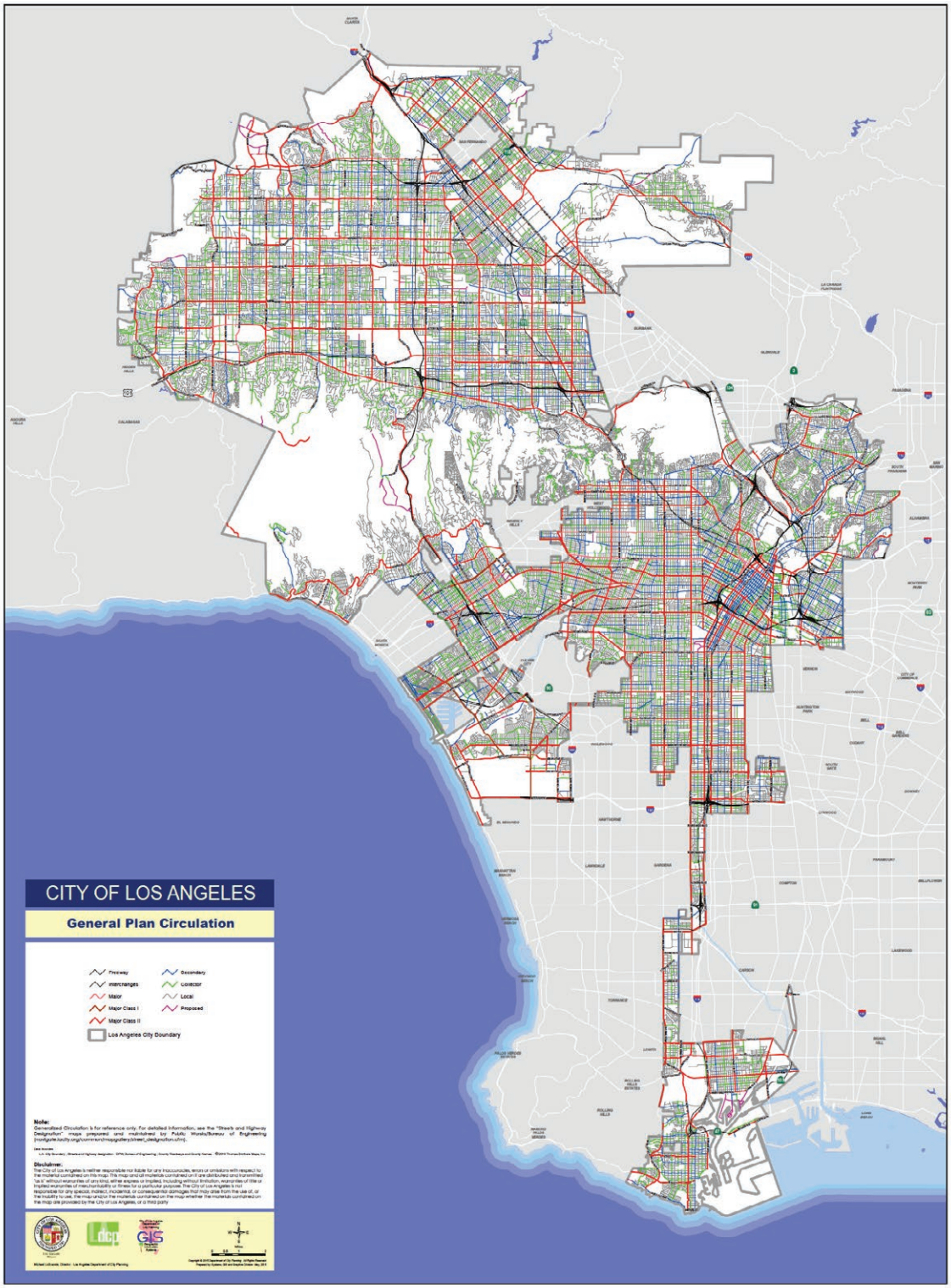
The land use element must designate the proposed general distribution, location, and extent of land uses, and shall include a diagram or diagrams (Gov. Code §§ 65302-65302(a)). For examples of such diagrams, see figures 6-8.

Figure 8: Land Use Map for Sonoma County



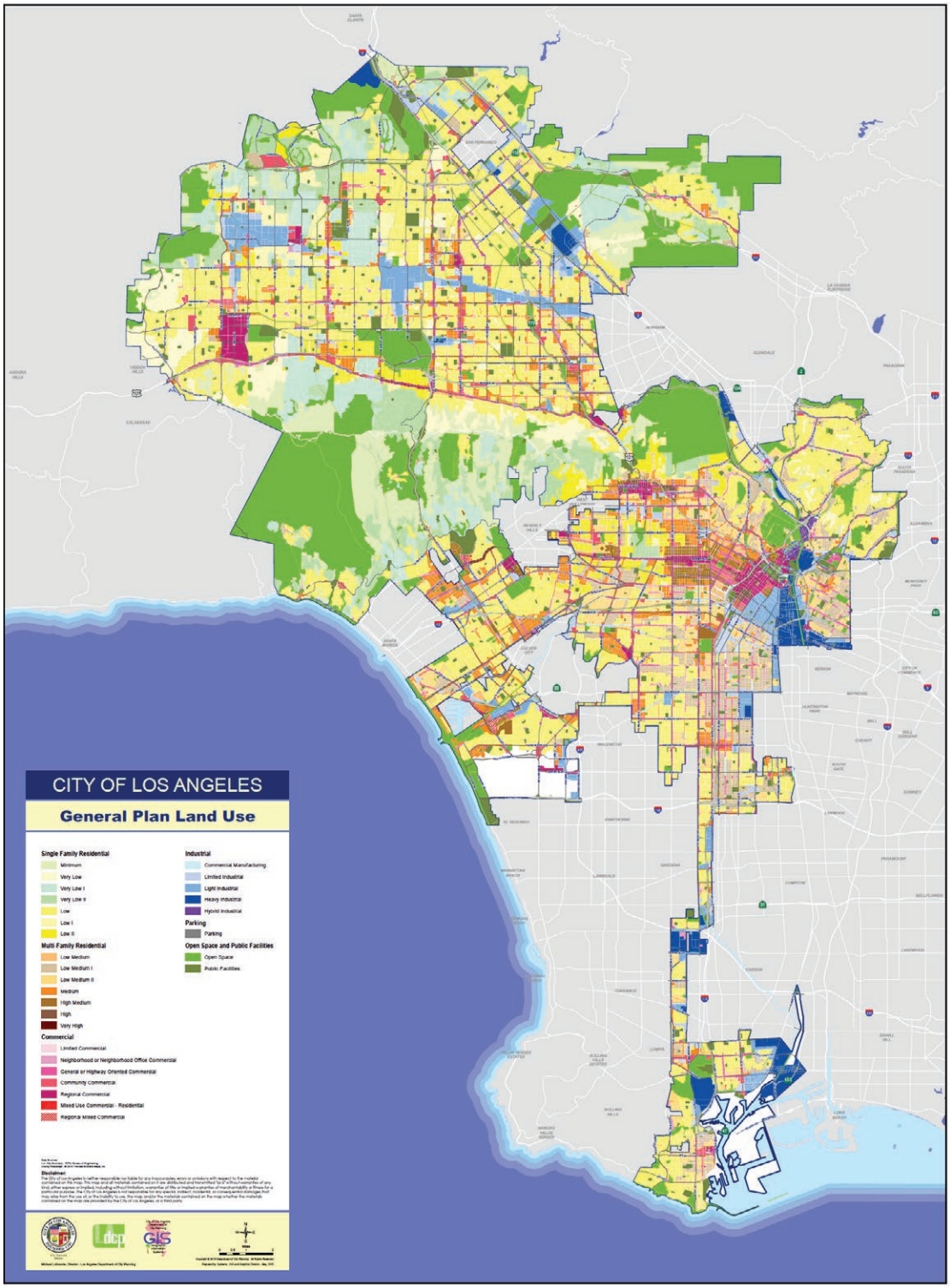
Source: http://www.sonoma-county.org/prmd/gp2020/fig-lu1.pdf

Figure 9: City of Los Angeles Circulation Map



Source: http://planning.lacity.org/mapgallery/Image/Citywide/GenCirculation.pdf

Figure 10: City of Los Angeles Land Use Map



Source: planning.lacity.org

Many types of development policies lend themselves well to graphic treatment, such as the distribution of land uses, urban design, infrastructure, and geologic and other natural hazards. A diagram must be consistent with the general plan text and should have the same long-term planning perspective as the rest of the general plan. The text and diagrams in the land use element that address the location and extent of land uses, and the zoning ordinances that implement these provisions, may also express community intentions regarding urban form and design. Such diagrams and text may differentiate neighborhoods, districts, and corridors; provide for a mixture of land uses and housing types; and provide specific measures for regulating relationships between buildings as well as between buildings and outdoor public areas (Gov. Code § 65302.4). Jurisdictions may adopt traditional land use typologies, such as mixed use or residential, that are based on urban form and design—for example, Sacramento has created categories for "transit centers" and "new growth areas"—or they may use a combination of typologies. Caltrans' Smart Mobility Framework suggests seven place type categories with sub-categories to fit local context and relates community design to circulation and access through efficiency factors. Some communities have adopted similar place types, modified for local context.

The Attorney General has observed that "...when the Legislature has used the term 'map,' it has required preciseness, exact location, and detailed boundaries but no such precision is required of a general plan diagram." As a general rule, a diagram or diagrams, along with the general plan's text, should be detailed enough so that all users of the plan can reach the same conclusion on the appropriate use of any parcel of land at any particular phase in the physical development of a city or a county. Decision makers should also be able to use a general plan and its diagram(s) to make day-to-day land use and infrastructure decisions that are consistent with the future physical development scheme of a city or a county. Given the long-term nature of a general plan, however, its diagram(s) and text should be general enough to allow a degree of flexibility in decision-making as times change. For example, a general plan may recognize the need for and desirability of a community park in a proposed residential area without immediately designating its precise location. Accordingly, the plan should have a generalized diagram along with policies stating that selection of the park site and appropriate zoning will take place when subdivision of the area is approved.

Many communities use a map as the general plan diagram. The land use element should focus on the future growth and physical development of the community in accordance with the land use map while ensuring the provision of adequate infrastructure and services to existing communities. Maps are useful for designating land use categories, as well as building densities, FAR, and other development goals. The maps in figures 6-8 demonstrate some of these varying uses. Observing proposed land uses side by side on a map will help decision makers and the public understand the relationships between them. It may also be helpful to include other elements, such as circulation and infrastructure, in the land use map when possible. Including known assets such as roads, transit routes, job centers, and service centers can help inform decisions about future land uses and needs. For example, the City of San Diego created numerous maps in which community features such as wastewater facilities and bikeways are overlaid onto more traditional depictions of land use and the street system, while the City of Emeryville used mapping to designate density and intensity in each land use category. The GPG Mapping Tool can help communities layer data to identify areas of need and opportunity as well as potential locations for specific types of land use.

Categories used in the land use element should align with the goals of the general plan. For example, a jurisdiction wanting to promote infill development and compact growth may consider setting minimum density standards along with traditional maximums.

In some instances, land use policies provide the basis for requiring exactions and development fees of new projects (for example, parks and recreational facilities under the Quimby Act of 1975 (Gov. Code § 66477). The distribution of land use categories that are reflected in the plan diagram must conform to the plan's policies. Law does not require existing development to fully adhere to all of the development policies set forth by the plan; however, new and future development must be in uniform compliance.

The land use element requirements provide an opportunity to determine the future of a community. By ensuring thoughtful, equitable, and accessible distribution of different densities, intensities, and land uses and by aligning with other general plan elements, the land use element can address long term environmental issues such as climate change, enhance local economies, reduce infrastructure costs, facilitate healthy lifestyles, improve air quality, increase transportation choices, create community resilience, also address emerging developments in technology, such as connected and autonomous vehicles, and resulting changes in land use, and promote quality housing for all residents of the community.

Housing, Business, and Industry

Requirement Description:

A land use element must designate the general distribution, location and allowable intensity of use for housing, business, and industry. To do so, a jurisdiction should

- Examine population data, including regional and local population and growth forecasts.
- Identify demographic trends (age, income, persons per household, vehicle ownership rates, etc.).
- Inventory existing residential, commercial, and industrial land use in the planning area.
- Identify key community assets (i.e., a thriving downtown, waterfronts, or open spaces, particularly those identified in the open space and conservation elements) that should be enhanced or preserved.
- Identify geographic, fiscal, and institutional limitations that may affect the location and type of future growth, such as infrastructure capacity (water and energy service, sewage treatment, storm drainage adequacy, fiber optics, etc.) and environmental concerns (flooding, fire hazard, noise, etc.).
- Consider functional and physical differentiation of land uses – neighborhoods, districts, corridors, employment centers, etc.
- Analyze existing urban form – blocks, connectivity, building footprints, relationship to street frontages, parking allocations, etc.
- Analyze properties subject to land use development—vacant, underdeveloped, transit-oriented, etc.—and include a discussion of the methodology used to identify such properties.
- Determine project needs for specific land use considerations, including watershed and groundwater recharge; residential, commercial, and industrial development based upon estimates of future population; anticipated changes in environmental conditions such as those resulting from climate change; and economic conditions.

Additionally, the land use element should consider the appropriate methodology for identifying land use designations aligned with general plan goals. For example, it may designate residential and commercial growth in a series of connected areas or along existing

transit routes so as to encourage compact development and promote access for various populations, or it may require buffer zones surrounding industrial land and hazardous materials sites.

The general plan tends to be more about long-range planning and looking forward. However, considering current conditions and past planning decisions is important to ensure that the land use element does not perpetuate or exacerbate existing problems. Data and tools such as the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment has developed Cal EnviroScreen as a screening methodology that identifies California communities that are disproportionately burdened by pollution. In the context of planning for future growth, such data may inform future decisions about whether certain locations are appropriate for additional commercial and industrial facilities. It is good planning for all jurisdictions to address this. Certain jurisdictions subjected to SB 1000 will now be required to address environmental justice issues. (See EJ section and Chapter 5 for more information on equity and environmental justice).

Land use decisions can have other significant impacts on health. Increases in density, development intensity, and a mix of land uses can promote physical activity and the use of active transportation and transit. The use of flexible and context sensitive urban design strategies can promote walkable and bikeable environments, which has been shown to be beneficial for health.

SAMPLE OF OPR RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of analysis	Recommended Data
Identify locations in need of particular community assets.	Population density (US Census).
Identify potential gaps in services.	Types of businesses geographically.
Support mixed-use communities and vibrant places supportive of recreation, retail, and housing.	Diversity of functional zoning.

Open Space, Including Agricultural Land, Natural Resources, and Recreation

Requirement Description:

A land use element must provide for the general location and distribution of land uses for "open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty" (Gov. Code § 65302(a)). Determining policies and locations for open space in the land use element may help create a foundation to build detailed policies in the conservation and open space element, or connect to themes such as economic development, climate change, equity, or healthy communities for general plans not organized by elements.

The land use diagram should designate and correspond to the inventory of existing open space and identify public land for future open space, as detailed in the open space element. This may include designation of parks, greenways, forests, community gardens, public beaches, fishing piers, access points to marine protected areas, and other open space categories identified by the community. Promoting equitable access to parks, open space, and recreational assets, will afford all communities the opportunity to be physically active.

Statewide policies favor preservation of open space.

(a) "That the preservation of open-space land ... is necessary not only for the maintenance of the economy of the state, but also for the assurance of the continued availability of land for the production of food and fiber, for the enjoyment of scenic beauty, for recreation and for the use of natural resources.

(b) That discouraging premature and unnecessary conversion of open-space land to urban uses is a matter of public interest and will be of benefit to urban dwellers because it will discourage noncontiguous development patterns which unnecessarily increase the costs of community services to community residents" (Gov. Code § 65561).

For cities and counties with agricultural lands, consideration of those lands specifically in a broader land use context may help identify better policies to achieve their general plan goals. In addition to their value as an economic driver, agricultural lands can help cities and counties preserve open space lands' aesthetic qualities, maintain physical separation between urban areas, and preserve biological resources. However, some of the most valuable agricultural lands are located closest to growing cities and are thus at highest risk for conversion. Without appropriate land use planning and policies that encourage conservation, many of these spaces may be permanently lost. Tax incentives for converting vacant space into urban agricultural zones provide potential tools for cities with smaller plots of useable land.

The land use element policies and maps must be consistent with the conservation and open space element, both of which contain more specific requirements.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Identify proportion of the population, especially vulnerable or disadvantaged communities, within X miles of recreational open space and with ready access to it (e.g. transit).	Census tract data with geo-mapping overlay of recreational open space overlaid with mass transit routes.
Identify areas important to water supply or water quality to ensure protection.	Water supply source areas, infiltration areas, areas above groundwater supplies, wetlands, natural filtration basins, and priority recharge zones.

Educational Facilities

Requirement Description:

The land use element must plan for the use of land for "education" (Gov. Code § 65302(a)). Educational facilities may include district-run facilities, but also charter schools, private schools, parochial schools, preschools, closed and surplus school properties, career colleges, higher education satellite campuses, home school centers, independent study centers, adult education and regional occupational programs. Local governments and school districts have separate but related statutory requirements and authority, as explained in the list below, and coordination is mutually beneficial. Land use may affect school functions—for example, by facilitating safe routes to schools. Similarly, the placement of schools within a community may influence circulation patterns and housing decisions. School siting should consider regional growth characteristics as well as changes in demographics and density as state

and local laws change to prioritize more resource efficient development patterns, including agricultural farmland preservation. Additionally, school districts and communities should consider climate related risks, such as flooding, fire, and other hazards, when planning new facilities. Ensuring that school districts participate in the planning process through outreach, engagement, and coordination where possible can benefit the community, reduce potential future issues, and facilitate alignment between city, county, and district goals.

California Code of Regulations, Title 5, §14001. Minimum Standards:
Educational facilities planned by school districts shall be:

(a) Evolved from a statement of educational program requirements which reflects the school district's educational goals and objectives.

(b) Master-planned to provide for maximum site enrollment.

(c) Located on a site which meets California Department of Education standards as specified in Section 14010.

(d) Designed for the environmental comfort and work efficiency of the occupants.

(e) Designed to require a practical minimum of maintenance.

(f) Designed to meet federal, state, and local statuary requirements for structure, fire, and public safety.

(g) Designed and engineered with flexibility to accommodate future needs

School districts are required to comply with city/county zoning ordinances if the city/county has an adopted general plan and the ordinances make provisions for the location of public schools. Nevertheless, a school district governing board that has complied with notification requirements may, by a two-thirds vote, "render a city or county zoning ordinance inapplicable to a proposed use of property by the school district" for classroom facilities (Gov. Code § 53094) pursuant to Attorney General Opinion No. 99-401, "even though such use would not be in conformity with the general plan" (82 Ops.Cal.Atty.Gen. 135). There are certain exceptions to the ability of a school district to render zoning inapplicable (Gov. Code § 53094), such as property within a farmland security zone or property covered by regional plans, such as those adopted by the Coastal Commission or Tahoe Regional Planning agency. School districts must also comply with city and county ordinances regulating improvements in drainage, roads, and on-site grading plans (Gov. Code § 53097). Additionally, charter schools may have separate rules and requirements, including exemption from certain laws governing school districts (Ed. Code § 47610). Early coordination between school districts and planners can help improve outcomes for all. The National Safe Routes to School Partnership outlines numerous best practices for school siting, as well as case studies on communities around the nation. Although cities and counties control land use approvals, and school siting is controlled by local school districts, consultation between those entities is required at several points in the planning process. Before adopting a general plan, a local government must solicit input from affected school districts (Gov. Code § 65352(a)(2)). The Local Agency Formation Commission (LAFCO) should also be consulted early in the process of school site consideration.

- Before completing any long-range plans that contemplate school site acquisition, a school district must notify local government planning agencies and must participate in a meeting if requested (Gov. Code § 65352.2(b)).
- Before the acquisition of property for facilities, school districts must consult with the planning agency of local governments (Gov. Code § 65402(c)).
- Before obtaining the title to land for a proposed school site or adjacent to a present school site, the governing board of each school district shall give written notice to the planning commission with jurisdiction. The planning commission shall then investigate the proposed site (Pub. Resources Code § 21151.2).
- "The governing board of any school district shall meet with appropriate local government recreation and park authorities to review all possible methods of coordinating planning, design, and construction of new school facilities and school sites or major additions" (Ed. Code § 35275).
- Prior to acquiring a school site that is designated in a local general plan for agricultural uses, a school district must consult with the local government (Ed. Code § 17215.5(a)). If the proposed school site is within an agricultural preserve, additional notification to the California Department of Conservation is required (Gov. Code § 51291(b)).
- Additional notification to the local airport land use commission may also be required (Pub. Utilities Code § 21676).

Consultation between local governments and school districts at these various points in the planning process may resolve conflicts before they arise, creating a more efficient process. Useful consultation topics may include

- District school facilities' master plans and the acreage necessary to build a school, as well as other location factors.
- The ability of potential school sites to be accessed by parents and students on foot, or by public transit.
- The potential impacts that agricultural operations, industry, waste facilities, or other polluting land uses may have on schools.
- The potential for joint use of parks or co-location with other facilities, given the tendency for schools to function as hubs for the community during school and non-school hours

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Proximity of schools to housing and transportation.	School locations, including private and charter schools, residential areas, transit maps, bike and pedestrian routes.
Potential joint use programs between schools and communities.	Community assets and needs, school facilities and hours.
Density of fast food outlets within ½ mile of schools (most relevant for high schools with open campuses).	City/county permit records.
Proximity of schools to safe active transportation options to/from home/school.	Circulation element (sidewalks, bike paths; school catchment areas), motor vehicle related pedestrian and bicycle crash rates.
Health impacts of location.	Youth obesity prevalence.

Public Buildings and Grounds

Requirement Description:

The land use element must plan for the use of land for "public buildings and grounds" (Gov. Code § 65302(a)). Such "public buildings and grounds" may include community centers, libraries, and clinics. New or enhanced public facilities can catalyze other planned development as well as redevelopment of existing areas. Additionally, thoughtful distribution of public buildings can help ensure equitable access to public resources and services throughout the community. Consideration should be given to housing and transportation access surrounding proposed public buildings, as well as preservation of access to existing buildings and grounds. Depicting planned future public facilities in the general plan diagram or using symbols to identify possible future use may help align these uses with other community assets and needs.

An inventory of public buildings and grounds will help assess the distribution of public facilities across the community and identify underserved areas. The land use element should also assess the need for additional facilities based upon existing need for enhanced services and projected increases in land use intensity and population. An inventory of public and private historical landmarks (Pub. Resources Code § 5024) and existing public surplus land should also be included.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Equitable distribution of public facilities. Increased opportunity for community access to public facilities.	Community asset maps.
Access to public facilities.	Transit maps and timetables; population and demographics.
Density of fast food outlets within ½ mile of schools (most relevant for high schools with open campuses).	City/county permit records.
Opportunities for shared use of public buildings by communities, e.g., meeting spaces, auditoriums, etc.	Inventory of publicly owned facilities, including size, location, resources, and access.

Solid and Liquid Disposal Facilities

Requirement Description:

The land use element must plan for the use of land for "solid and liquid waste disposal facilities" (Gov. Code § 65302(a)). Plans should include an inventory of existing solid and liquid waste disposal, recycling, anaerobic digestion, remanufacturing and composting facilities to aid compliance with the Countywide Integrated Waste Management Plan and other associated laws as noted below. Waste reduction and recycling is an essential element of a sustainable community. In addition to conserving resources and protecting the environment, reducing waste and remanufacturing products using recycled materials benefits local communities by reducing greenhouse gas emissions, creating jobs, addressing food insecurity, and has many other benefits. Based upon projected land uses and population growth as well as potential opportunities to reduce waste streams, the land use element should consider the infrastructure that is needed to recover edible food waste and facilitate its delivery to food banks and other appropriate entities. The element should also consider the potential need for additional recycling, anaerobic digestion, composting and remanufacturing facilities. For example, recycling organic materials through composting, mulching, and anaerobic digestion – pursuant to SB 1383,

the Short Lived Climate Pollutants Act of 2016, the Solid Waste: Diversion Act of 2011, the Solid Waste: Organic Waste Act of 2014 (SWOWA), the AB 32 Scoping Plan, and local requirements – can produce renewable energy and fuel and reduce GHG emissions. As jurisdictions establish organic material recycling programs, the general plan should consider the infrastructure that is needed to support increased diversion of organics from landfills, including the location of new facilities, the possibility of upgrading existing facilities to accommodate organic material specifically, (i.e., co-locating composting and digestion facilities at existing facilities such as transfer stations, material recovery facilities, and landfills), or the creation of new curbside collection requirements for food scraps with yard waste. The land use element should also include a transparent and proactive process to involve potentially impacted or disadvantaged communities in the early stages of facility planning and permitting processes. These issues may also be addressed in the county climate action plan. If relevant, cities and counties should consult with special districts and utilities providers to ensure the proposed land use plan is supported by adequate facilities.

In October of 2015, Governor Brown signed AB 876 (McCarty) to address longer-term planning for organics infrastructure by requiring counties and regional agencies to report the following information to CalRecycle commencing on August 1, 2017:

(1) An estimate of the amount of organic waste in cubic yards that will be disposed by the county or region over a 15-year period.

(2) An estimate of the additional organic waste recycling facility capacity in cubic yards that will be needed to process the amount of organic waste identified.

(3) Areas identified by the county or regional agency as locations for new or expanded organic waste recycling facilities capable of safely meeting the additional organic waste recycling facility capacity need identified.

Addressing the facilities that may need to be expanded or sited to process the organic materials in 15 years will require each county or regional agency to assess its unique situation, including existing facilities and their ability to process the material, and any new or expanded facilities that can be identified.

In addition, the general plan should consider the potential impacts of solid and liquid waste facilities, waste-to-energy plants, and similar facilities on surrounding land uses and access routes as identified in the circulation element. Generally, schools, hospitals, residences, and other potentially sensitive buildings should not be located where nearby facilities could have adverse health impacts. When designating new areas in the land use plan for waste facilities, the city or county should carefully consider whether surrounding areas are already burdened by existing sources of pollutants.

The publication, Model Goals, Policies, Zoning, and Development Standards for Composting and Remanufacturing Facilities, is intended to educate and inform local policy-makers and planners about land use planning approaches and zoning tools to encourage the economically beneficial use of recyclable materials generated in California. It identifies options and model language for general plan goals and policies, as well as zoning ordinance standards related to anaerobic digestion, composting, and remanufacturing facilities using recycled materials. These examples provide a starting point that can be modified to fit individual city or county circumstances.

Planning for Organic Waste Diversion

California has an ambitious goal of 75 percent recycling, composting, or source reduction of solid waste by 2020. Achieving that goal will require the recycling, composting, or source reduction of an additional 23.5 million tons of recyclables annually, a significant portion of which is organic material. To redirect that much organic material by 2020 will require major efforts on many fronts, including the expansion or siting of many facilities to accommodate higher recycling volumes, stronger markets for recycled materials, ideally within underserved regions of the state, that are sustainable and responsive to local needs and opportunities.

In September 2016, Governor Brown signed SB 1383 (Lara, Chapter 395, Statutes of 2016), establishing methane emissions reduction targets in a statewide effort to reduce emissions of short-lived climate pollutants (SLCP) in various sectors of California's economy. Actions to reduce short-lived climate pollutants are essential to address the many impacts of climate change on human health, especially in California's most at-risk communities, and on the environment. SB 1383 establishes targets to achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025. The law also establishes an additional target that not less than 20 percent of currently disposed edible food is recovered for human consumption by 2025. Additional information on the organic waste recycling requirements can be found at CalRecycle's SLCP Webpage.

SB 1383 builds upon California's leading commitments to reduce greenhouse gas emissions and air pollution statewide. Governor Brown identified reductions of short-lived climate pollutant emissions, including methane emissions, as one of five key climate change strategy pillars necessary to meet California's target to reduce greenhouse gas emissions 40 percent below 1990 levels by 2030 as established in SB 32 (Pavley, Chapter 249, Statutes of 2016). SB 1383 will further support California's efforts to achieve other policies, such as increased commercial recycling as mandated by the Solid Waste: Organic Waste Act of 2014, hereafter referred to as SWOWA, and greater recycling by the general public.

To achieve these goals and targets, local agencies are turning to innovative technologies like anaerobic digestion to convert waste into energy and to reduce greenhouse gas emissions that contribute to climate change. Local anaerobic digestion projects provide a number of benefits including landfill disposal cost savings, the ability to meet greenhouse gas reduction and state waste diversion goals, and increased community pride and recognition for their role as an environmental leader. Anaerobic digestion facilities have the option of producing electricity or natural gas with heat as a co-product. Electricity can be used to power the facility itself or can be exported to the electrical grid. Natural gas can be used to fuel natural gas vehicles, including solid waste and recycling trucks, delivery trucks, passenger vehicles, and buses. Either energy choice will generate a revenue stream which can help offset the costs of the facility.

The Sacramento BioDigester started in 2012 with the capacity to process 10,000 tons of food waste per year, and its capacity expanded to four times that amount in early 2015. The 40,000 ton input capacity includes food waste from area restaurants, food processors, hospitals, the international airport, elementary schools, and supermarkets. The 730,000 gallons of biofuel produced annually are used at an onsite fueling station to fuel all of the natural gas trucks of the local trash and recycling collection fleet (24 of 55 trucks) as well as a portion of the city's and county's waste fleets, security cars, California State University, six Sacramento commuter buses, and two local

catering companies. The BioDigester also has an exclusive contract to provide natural gas to Sacramento School District's 6-12 buses and is the backup provider for Elk Grove's 6-12 buses. The waste gas that is not clean enough to use for transportation fuel is used to produce one million kilowatts of electricity which powers both the facility and the fueling station. The digestate is used to produce eight million gallons of organic soils and fertilizers for Sacramento area farms.

Alameda County adopted its Community Climate Action Plan in February of 2014. It builds off the county's already exemplary waste management programs by establishing a target of diverting 90 percent of all waste from landfills by 2030 with an interim goal of 82.5 percent by 2020. To achieve this, the county has outlined measures and strategies that include mandatory household and commercial food waste recycling and a corresponding outreach and education program. The Alameda County Waste Management Authority Board, also known as StopWaste.Org, is a joint powers authority. Its members include the county, the fourteen cities in the county, and two special districts that provide solid waste and recycling services. Its education activities aim to encourage businesses to recycle and include technical assistance for waste prevention and recycling, targeted outreach and assistance to large businesses, online resources for smaller businesses, grants for businesses, and a high profile recognition program for businesses that recycle.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Safety and health concerns for vulnerable populations.	Locations of schools and hospitals as well as populations of children and elderly facilities or communities.
Vehicle miles traveled (VMT) effects of waste facility location.	Distances and frequency of truck travel between residential and commercial centers and facilities; local sustainable communities strategies (SCS).
15 years capacity needed for organics recycling.	Capacity needed and available/planned infrastructure.

Greenways

Requirement Description:

A land use element must designate the proposed general distribution, location, and extent of uses of land for greenways, defined by Civil Code 816.52(b) as "a pedestrian and bicycle, nonmotorized vehicle transportation, and recreational travel corridor that meets the following requirements:

(1) Includes landscaping that improves rivers and streams, provides flood protection benefits, and incorporates the significance and value of natural, historical, and cultural resources, as documented in the local agency's applicable planning document, including, but not limited to, a master plan, a general plan, or a specific plan.

(2) Is separated and protected from shared roadways, is adjacent to an urban waterway, and incorporates both ease of access to nearby communities and an array of amenities within an urbanized area and services for the users of the corridor and nearby communities.

(3) Is located on public lands or private lands, or a combination of public and private lands, where public access to those lands for greenway purposes has been legally authorized by, or legally obtained from, the fee owner of the land and, if applicable, the operator of any facility or improvement located on the land, through leases, easements, or other agreements entered into by the fee owner and the operator of any affected facility or improvement on the land.

(4) Reflects design standards regarding appropriate widths, clearances, setbacks from obstructions, and centerlines protecting directional travel, and other considerations, as appropriate, that are applicable for each affected local agency, as documented in the local agency's applicable planning document, including, but not limited to, a master plan, general plan, or specific plan, and that are consistent with plans and facilities for controlling the floodwater of rivers and their tributaries, as applicable.

(5) May incorporate appropriate lighting, public amenities within an urbanized area, art, and other features that are consistent with a local agency's planning document, including, but not limited to, a general plan, master plan, or specific plan."

Planning for greenways should coordinate closely with the circulation, conservation, and open space elements, and consider implications on community health, economic development, environmental justice, and social equity.

Identify and Annually Review Areas Subject to Flooding

Requirement Description:

In addition to the requirement to designate specific land uses, the land use element must "identify and annually review those areas covered by the plan that are subject to flooding identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources" (Gov. Code § 65302(a)).

When fully informed by applicable flood information and assessments of climate change impacts and management practices, careful land use planning can effectively reduce vulnerability to potential flood damage in cities and counties. Such careful planning can include non-structural flood protection measures, low impact development, and improved stormwater management practices. Federal, state, and local agencies may construct and operate flood protection facilities to reduce flood risks, but some amount of risk will remain for those residing in floodplains. Therefore, increasing awareness can help ensure Californians recognize the potential threat and are better prepared to respond to flood emergencies.

The Land Use: Water Supply Act of 2007 (AB 162, Wolk) requires additional consideration of flood risk in local land use planning throughout California and named the Department of Water Resources (DWR) as a source for floodplain information and technical data for local governments. The Sustainable Groundwater Management Act of 2014, hereinafter referred to as SGMA, considers the connections between groundwater management, land use, and flood management and allows local agencies to customize plans to their regional needs.

DWR published two reports—Implementing California Flood Legislation into Local Land Use Planning: A Handbook for Local Communities and Guidance on General Plan Amendments for Addressing Flood Risk—to provide assistance and recommendations for local government compliance with 2007 flood legislation. DWR also created a sustainable groundwater management toolbox to assist with SGMA.

Local jurisdictions must assess floodplain mapping, groundwater recharge, and stormwater management information and determine any needed changes in the general plan. If new data comes to light, then the existing general plan's background information, maps, goals, policies, and implementation measures may need updating. As flood risk may change over time, cities and counties should establish policies for land use that are consistent with evolving flood risks.

The land use element policies addressing flooding should also be consistent with additional flood control policies required in the conservation and safety elements, as well as any policies related to climate change, and should consider the potential for groundwater recharge benefits for water supply. When linked to consistent policies in other elements, addressing flooding through hazard area identification and land use management policies may help jurisdictions reduce redundancy in their general plans

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Incorporate stormwater capture and low impact development (LID) for water supply benefits and safety into site planning.	Levee flood protection zones; 100-year floodplain maps; 200-year floodplain maps (if available); 500-year floodplain maps; Awareness floodplain maps; Best available maps.
Identify populations with evacuation challenges.	US Census data on disabled persons, the elderly, and households with transportation barriers.
Identify opportunities for integration between habitats.	Choices in site planning – see DWR Land Use Surveys.

Identification of Timberland Production Zone Lands

Requirement Description:

The land use element must designate "parcels of real property zoned for timberland production pursuant to the Timberland Productivity Act of 1982 ..." (Gov. Code § 65302(a)(1)). Under the Z'berg-Warren-Keene-Collier Forest Taxation Reform Act of 1976, land zoned for timber production receives substantial tax benefits. Such timber production zones (TPZ), also known as timber preserve zones, are restricted to the production of timber or compatible use for ten years, followed by annual automatic renewal unless otherwise terminated (Gov. Code § 51114, 51115). These acres of TPZ represent the State's long-term, privately owned forestland base.

As population increases, encroaching development threatens timberland production zones. The state discourages the expansion of urban services into timberlands and "premature or unnecessary conversion of timberland to urban and other uses" (Gov. Code § 51102(a)). Ensuring the continual growing and harvesting of timber is important "to ensure the long-term productivity of the forest resource, the long-term economic viability of the forest products industry, and long-term stability of local resource-based economies" (Gov. Code § 51101(c)). The land use element regarding TPZ should support and remain consistent with policy objectives in the conservation and open space elements

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Impact of New Growth on Military Readiness Activities

Requirement Description:

A land use element must include consideration of impacts to the military's operations. Specifically, Government Code section 65302(a)(2) requires consideration of impacts of land use decisions on military. The law states that the land use element of the general plan shall "[c]onsider the impact of new growth on military readiness activities carried out on military bases, installations, and operating and training areas, when proposing zoning ordinances or designating land uses covered by the general plan for land, or other territory adjacent to military facilities, or underlying designated military aviation routes and airspace" (Gov. Code § 65302(a)(2)).

To encourage collaboration between the military and local jurisdictions and to prevent land use conflicts with military installations and training activities, California law created a notification process to inform the military of local land use proposals that might have an impact on military facilities and operations. The law requires that local governments 1) use development permit applications that identify proposed projects within 1,000 feet of a military installation, beneath a low-level flight path, or within special use airspace and 2) notify the military when a proposed project, or an updated or revised general plan, might have an impact on military facilities and operations (Gov. Code § 65944(d)). The California Military Land Use Compatibility Analyst (CMLUCA) can help identify where military operations are in relation to cities and counties. CMLUCA can also generate a report to notify the military when there is a project proposed under military airspace.

Military Compatibility Planning Resources

For more information on military compatibility issues, please see OPR's California Advisory Handbook for Community and Military Compatibility Planning and the Community and Military Compatibility Planning: Supplement to the General Plan Guidelines.

Military staff are available to work with local governments on military compatible land use planning. For more information, and a memo on Government Code section 65352(a)(6)(A) and Government Code section 65944(e) notification requirements, please see OPR's California Strategic Coordination and Engagement Program.

Local military activity or Department of Defense Service points of contact can provide specific information about military installations and training areas within your county or city. It is important to check with the military points of contact to discuss the particular military operations in your area and how a local government's vision for development can be compatible with those operations. In the case of areas with low-level flight paths, it is particularly important to coordinate with the branch points of contact. OPR maintains a list of military branch points of contact.

Each city and county should implement a process to identify, coordinate, and assist in resolving potential land use conflicts within nearby military training areas or under military special use airspace to ensure that new development is compatible with military operations and with mission training and testing requirements. New development should be reviewed and regulated to avoid impact to military operations areas (MOAs) and to maintain public safety. The General Plan Mapping Tool and the CMLUCA both can help map locations of military operations. The local jurisdiction should inform the military officials of any changes by school districts, charter schools or other state level agencies that may affect military readiness.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Map military sites in relation to general plan area.	CMLUCA

Identify Unincorporated Island or Fringe Communities (Cities) or Legacy Communities (Counties)

Requirement Description:

According to legislative findings in Senate Bill 244 (Wolk, 2011), hundreds of unincorporated communities in California lack access to basic community infrastructure like sidewalks, safe drinking water, and adequate waste processing. These communities range from remote settlements throughout the state to neighborhoods that have been surrounded by, but are not part of, California's fast-growing cities. This lack of investment threatens residents' health and safety and fosters economic, social, and education inequality. Moreover, when this lack of attention and resources becomes standard practice, it can create a matrix of barriers that is difficult to overcome.

The purpose of SB 244 is to begin to address the complex legal, financial, and political barriers that contribute to regional inequity and infrastructure deficits within disadvantaged unincorporated communities.

Including these communities in the long range planning of a city or county, as required by SB 244, will result in a more efficient delivery system of services and infrastructure, including sewer and water services, structural fire protection, and other needs. In turn, investment in these services and infrastructure will result in the enhancement and protection of public health and safety for these communities.

The land use element must identify fringe, island, and legacy communities that are disadvantaged unincorporated communities. The identification must include a description of the community and a map illustrating its location. General plan law defines a community as "an inhabited area within a city or county that is comprised of no less than 10 dwellings adjacent or in close proximity to one another" (Gov. Code § 65302.10(a)(1)). SB 244 defines a "disadvantaged community" as a community with an annual median household income that is less than 80 percent of the statewide annual median household income (Gov. Code § 65302.10(a)(2).)[1]

Building infill development can maximize urban space and conserve resources

Image by Urban Advantage, Contra Costa County, CA

1 It should be noted that this definition of "disadvantaged community" is slightly different than the definition that applies for purposes of the environmental justice element required by SB 1000 (Gov. Code § 65302(h)(4)(A)).

"[I]sland communities" are defined as any inhabited and unincorporated territories that are surrounded or substantially surrounded by one or more cities or by one or more cities and a county boundary or the Pacific Ocean (Gov. Code § 65302.10(a)(4)); and "fringe communities" are defined as any inhabited and unincorporated territories that are within a city's sphere of influence (Gov. Code § 65302.10(a)(3)).

"Legacy communities" are defined as any geographically isolated communities that are inhabited and have existed for at least 50 years (Gov. Code § 65302.10(a)(5)).

Certain terms within these definitions can be interpreted differently based on local context. For example, terms such as "substantially surrounded" or "close proximity" can differ greatly between rural and urban communities.

Cities and counties should not rely solely on lists of disadvantaged unincorporated communities compiled by their LAFCO. Instead planners must do their own independent identification of all communities that meet the definition given above. Cities and counties may consult other agencies, organizations and reports that have identified unincorporated communities for assistance.

Planning for Disadvantaged Unincorporated Communities (Gov. Code § 65302.10)

(b) On or before the due date for the next adoption of its housing element pursuant to Section 65588, each city or county shall review and update the land use element of its general plan ... [to] include all of the following:

(1) In the case of a city, an identification of each island or fringe community within the city's sphere of influence that is a disadvantaged unincorporated community. In the case of a county, an identification of each legacy community within the boundaries of the county that is a disadvantaged unincorporated community but not including any area within the sphere of influence of any city. This identification shall include a description of the community and a map designating its location.

(1) For each identified community, an analysis of water, wastewater, stormwater drainage, and structural fire protection needs or deficiencies.

(1) An analysis, based on then existing available data, of benefit assessment districts or other financing alternatives that could make the extension of services to identified communities financially feasible.

(c) On or before the due date for each subsequent revision of its housing element pursuant to Section 65588, each city and county shall review, and if necessary amend, its general plan to update the analysis required by this section.

As part of the analysis of disadvantaged unincorporated communities, the land use element must analyze the water, water supply, wastewater, stormwater drainage, and structural fire protection needs or deficiencies for each community. The analysis should consider both the horizon year and the impacts of a changing climate. This analysis should also consider adequacy of groundwater resources, and be consistent with utilities planning in the circulation element and the fire and flood protection policies in the safety element. LAFCo municipal service reviews can be helpful in supporting this analysis.

The analysis must also review the use of benefit assessment districts or other financing alternatives that could make the extension of services to identified communities financially feasible. Each time the housing element is updated, the analysis for these communities must be reviewed, and if necessary, updated.

For more information, please see OPR's SB 244 Technical Advisory.

Cities and counties should use this chart to ask these questions while undergoing disadvantaged communities analysis:

Type of Infrastructure	What is serving the community now?	What is the need for additional infrastructure?	How can finance mechanisms meet the need?	Which other programs and policies could address the infrastructure deficiency?	What is the community's input?
Required (§65302.10)					
Water					
Wastewater					
Stormwater Drainage					
Structural Fire Protection					
Potential Additional Services					
Police Protection					
Sidewalks					
Lighting					
Libraries, Schools, Community Centers, etc.					
Alleys and other unsafe roadways					
Public transit/ transportation					
Preschools and childcare providers					

The land use element should be updated to include disadvantaged unincorporated communities analysis (Gov. Code § 65302.10). Since all elements of a general plan must be internally consistent, the safety element, the circulation element, and other elements as necessary should be reviewed to ensure consistency (Gov. Code § 65300.5).

The disadvantaged unincorporated analysis should consider where there may be opportunities to provide more efficient, high quality service through consolidation, extension of services, and other regional solutions to address inadequacy of services and infrastructure. In addition, the analysis should consider whether the reorganization will unify or divide any other public agencies such as school districts, transit districts, and flood management agencies.

Correlation with Circulation Element

Senate Bill 375, the Sustainable Communities and Climate Protection Act of 2008 (Steinberg), hereinafter referred to as SB 375, supports the state's climate action goals to reduce GHG emissions through coordinated transportation and land use planning and to create sustainable communities. This concept is discussed further in the circulation element section.

4

The Land Use Element and Regional Sustainable Communities Strategies

> *California's land is an exhaustible resource, not just a commodity, and is essential to the economy, environment and general well-being of the people of California. It is the policy of the state ... to protect California's land resource, to insure its preservation and use in ways which are economically and socially desirable in an attempt to improve the quality of life in California.* (Gov. Code § 65030).

Most land use approvals occur at the local government level. Nevertheless, local land use elements must reflect their statewide and regional contexts. For example, Government Code section 65030.1 states:

> [D]ecisions involving the future growth of the state, most of which are made and will continue to be made at the local level, should be guided by an effective planning process, including the local general plan, and should proceed within the framework of officially approved statewide goals and policies directed to land use, population growth and distribution, development, open space, resource preservation and utilization, air and water quality, and other related physical, social and economic development factors."

When adopting a general plan, local governments must consult with other entities that may be affected by the plan, such as neighboring cities, counties and special districts, school districts, local agency formation commissions, area-wide planning agencies, federal agencies, the military, water providers, and California Native American tribes (Gov. Code § 65352).

Several regional activities may directly bear on local land use planning. One significant example is the sustainable communities strategy contained within regional transportation plans. While the Government Code states that a sustainable communities strategy does not regulate the use of land (Gov. Code § 65080(b)(2)(K)), local governments should consider and, if appropriate, incorporate applicable policies into local land use elements for several reasons.

First, sustainable communities strategies should already reflect the basic outlines of local plans. Second, some transportation funding is tied to consistency with the regional transportation plan. Third, consistency with the sustainable communities strategy may help streamline benefits under the California Environmental Quality Act of 1970 (CEQA). Fourth, CEQA analysis for the general plan requires analysis of any inconsistency with the regional transportation plan.

A sustainable communities strategy might be relevant to a local land use element in several ways. A sustainable communities strategy should identify locations within the region where land use and transportation investments can be maximized. Therefore, a local government planning agency should consider whether the land use element places development in transportation-efficient locations as identified in the sustainable communities strategy. Other relevant policies include density and intensity maximums and minimums, as well as policies related to active transportation and protection of public health. Incorporating such policies into a local land use element and diagram may assist the local government in avoiding conflicts with neighboring jurisdictions and perhaps more importantly, in maximizing the benefits of transportation funding and regulatory streamlining.

Transit Oriented Development (TOD)

Cities and counties should promote more livable communities by expanding opportunities for transit-oriented development (TOD) so that residents minimize traffic and pollution impacts from traveling for work, shopping, school, and recreation. TOD is defined as moderate to high-density development located within an easy walk of a major transit stop, generally with a mix of residential, employment, and shopping opportunities. TOD encourages walking and transit use without excluding the automobile. According to the California Department of Transportation, "TOD can be new construction or redevelopment of one or more buildings whose design and orientation facilitate transit use." A well-designed, vibrant TOD community can provide many benefits for local residents and businesses, as well as for the surrounding region. Compact development near transit stops can increase transit ridership and decrease rates of vehicle miles traveled (VMT) thereby yielding a good return on transit system investments. TOD can also provide mobility choices, increase public safety, increase disposable household income by reducing transportation costs, reduce air pollution and energy consumption rates, help conserve resources and open space, assist in economic development, and increase the housing supply. TOD is a strategy that may help a community achieve its general plan goals related to circulation, housing, environmental quality, and economic development. Additionally, by improving access to jobs and housing and revitalizing existing neighborhoods, TOD can be a tool for promoting environmental justice. A variety of factors need to be considered during the development and implementation of TOD. These factors include transit system design; community partnerships; understanding of local real estate markets; coordination among local, regional, and state organizations; and providing the right mix of planning and financial incentives and resources. A successful TOD will reinforce the community and the transit system. Transit operators, property owners, and residents should be involved in the development of TOD proposals. Planners should consult data to identify and assess potential locations for TOD during preparation of the land use, circulation, and housing elements of the general plan. An inventory of potential development (and redevelopment) sites within a quarter to a half mile of existing and proposed transit stops may reveal potential locations for TOD. Additional data may be used to verify the optimum location and mix of uses to further refine the viability of TOD at specific transit hubs. These data may include origin and destination studies, transit ridership protections, and information related to the appropriate jobs-to-housing ratio and level of retail services. The appropriate density and intensity will support a high level of transit service. Local governments can promote TOD through general plan policies that encourage supportive densities and designs and a mix of land uses. TOD-supportive policies provide for higher land use densities, reduced parking requirements, decreased automobile traffic levels of service, and increased transit levels of service. TOD policies should facilitate a pedestrian-oriented environment with features such as traffic calming strategies, traditional street grid patterns with smaller blocks, and architecture that orients buildings to sidewalks, plazas, and parks rather than to parking.

Land use policies should align with other elements to provide opportunities for innovation and co-benefits

Image by Urban Advantage, JBG Companies; Duany Plater-Zyberk & Company

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate. A full list of recommended policies and examples can be found here

Sample Policy	Example of Application	Relationship to Other Elements
Provide for and encourage the development of a broad range of uses in the [city/county]'s commercial centers and corridors that reduce the need to travel to adjoining communities and capture a greater share of local spending.	La Habra	Circulation, economic development, climate change
[City, county shall] require that new neighborhoods be designed to locate all housing within ½ mile of a central gathering place that incorporates public spaces, shopping areas, access to transit, and/or community-supportive facilities and services.	Sacramento	Circulation, open space, equitable and resilient communities, healthy communities, economic development
[City, county shall] prioritize the provision of necessary major street infrastructure and utility capacities for properly zoned land, consistent with the general plan so that such land can be developed in a timely manner to supports economic development.	Fresno	Circulation, economic development
[City, county shall] review the general plan's residential and commercial capacities every five years and modify, as necessary, to reflect development that has occurred, its impacts, evolving market and economic conditions, and consistency with community values.	Pasadena	Open space, conservation, healthy communities, climate change

4

Circulation Element

Introduction

The circulation element is not simply a transportation plan, but rather a strategy addressing infrastructure needs for the circulation of people, goods, energy, water, sewage, storm drainage, and communications. By statute, the circulation element must correlate directly with the land use element, but also has direct relationships with other elements. The provisions of a circulation element affect a community's physical, social, and economic environment, as well as its health. The passage of SB 1000 in 2016 requires local governments to address environmental justice considerations related to circulation--such as access to transportation systems, air quality related to transportation, delivery routes and transit options for nutritional food access, and promotion of physical activity—upon the next revision of two or more elements in their general plan after January 1, 2018.

Government Code Section 65302 (b)

(1) A circulation element consisting of the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, any military airports and ports, and other local public utilities and facilities, all correlated with the land use element of the plan.

(2) (A) Commencing January 1, 2011, upon any substantive revision of the circulation element, the legislative body shall modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan.

(B) For purposes of this paragraph, "users of streets, roads, and highways" mean bicyclists, children, persons with disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation, and seniors.

Transportation systems are essential to any city or county and its economy, and can be designed to enhance opportunity and improve equity. However, the implementation and maintenance of infrastructure and resources is costly, impacts the environment, and affects human health. Transportation planning in California is rapidly changing, driven by a number of key factors:

- An increasing focus on access to destinations (connectivity) rather than just mobility, and transportation solutions involving proximity that better accomplish livability and environmental goals
- Constrained local government budgets
- A mismatch of anticipated revenue and future maintenance obligations under current policies
- An increasing focus on greenhouse gas emissions reduction and an ongoing focus on air quality

- An increasing recognition that we cannot "build our way out of congestion," in part because new capacity encourages more driving, but that congestion can be addressed with roadway pricing measures
- An increasing recognition of the transportation network's effect on land use, and in turn the effect of more disperse land use on the environment and human health
- Demographic and social trends creating increased demand for infill and walkable neighborhoods
- Emerging transportation solutions such as carshare, rideshare, and bikeshare services, which can reduce automobile dependence
- Enhanced technology and information such as Nextbus and Intelligent Transportation Systems (ITS) making navigation of multiple transportation systems more simple and convenient and in some cases influencing transportation choices.
- Introduction of emerging technologies such as partially or fully autonomous vehicles with potential to sharply increase VMT and alter land use scenarios

Further, recent legislation has driven change in the way local governments approach transportation and the types of solutions available:

- The Complete Streets Act
- Global Warming Solutions Act (AB 32)
- SB 32
- The Sustainable Communities and Climate Protection Act (SB 375) and the completion of Sustainable Communities Strategies
- CEQA Streamlining for infill projects (SB 226)
- Shift in CEQA transportation metric away from LOS to VMT (SB 743)

Many California communities are substantially revising their circulation elements to respond to and take advantage of this new legislation.

CORRELATIONS AMONG ELEMENTS

	Land Use	Housing	Conservation	Open Space	Noise	Safety	EJ
Circulation	IN STATUTE	RELATED	RELATED	RELATED	IN STATUTE	RELATED	RELATED

■ Identified in statute ■ Closely related to statutory requirements

Completeness Checklist

Local agency staff can use the following checklist to help ensure that the draft circulation element addresses all required issues. Please note that use of this checklist is purely advisory, and only contains issues that are legally required in Government Code section 65302(b). Circulation elements may address additional issues at the discretion of the local government. Because general plan formats may vary, this checklist suggests identifying where the particular government code provision is satisfied

Statutory Citation	Brief Description of Requirement
Gov. Code, § 65302(b)(1)	Existing and proposed major thoroughfares
Gov. Code, § 65302(b)(1)	Existing and proposed transportation routes
Gov. Code, § 65302(b)(2)	• Public transportation
Gov. Code, § 65302(b)(2)	• Bicycle
Gov. Code, § 65302(b)(2)	• Pedestrian
Gov. Code, § 65302(b)(2)	• Automobile
Gov. Code, § 65302(b)(2)	• Commercial goods
Gov. Code, § 65302(b)(1)	Existing and proposed terminals
Gov. Code, § 65302(b)(1)	Military airports and ports
Gov. Code, § 65302(b)(1)	Other local public utilities and facilities
Gov. Code, § 65302(b)(2)	Needs of children, persons with disabilities, and seniors?
Gov. Code, § 65302(b)(1); Fed. of Hillside & Canyon Assns. v. City of Los Angeles (2004) 126 Cal. App. 4th 1180, 1196	Identified funding for infrastructure identified in circulation element?
Gov. Code, § 65302(b)(1)	Circulation element is correlated with the land use element?

Required Contents

The circulation element must, consistent with Government Code Section 65302 (b), include the location and extent of existing and proposed

- Major thoroughfares
- Transportation routes
- Terminals
- Military airports and ports
- Public utilities and facilities

Statutory Requirements

The Government Code requires that any revision of circulation elements after Jan 1, 2011 must plan for a "balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan." Users are defined in statute as "bicyclists, children, persons with

disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation, and seniors." For more information on integrating complete streets concepts to help address these requirements, see OPR's "Complete Streets and the Circulation Element."

The circulation element must identify funding for capital, operations, and maintenance of planned additions to the network, additions that would be triggered by policies in the element, and the existing network.

Relationship with Regional Planning

California courts have recognized that general plans must reflect the regional context. Circulation elements must, therefore, account for both regional transportation plans and, in some cases, congestion management plans.

Regional Transportation Plans

Metropolitan planning organizations and regional transportation planning agencies prepare regional transportation plans in cooperation with Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Caltrans, the Air Resources Board, the Department of Housing and Community Development and other stakeholders, including system users. The purpose of the regional transportation plan is to establish regional goals, identify present and future transportation needs, deficiencies and constraints, analyze potential solutions, estimate available funding, and propose investments. In most regions in California, the regional transportation plan includes a sustainable communities strategy that aligns transportation investments with a land use pattern designed to reduce regional greenhouse gas emissions. In order to be eligible for federal and state funding, transportation projects must be consistent with the adopted regional transportation plan, including an applicable sustainable communities strategy.

Regional transportation plans are required to reflect certain population growth and distribution assumptions contained in local general plans. As a practical matter, circulation elements should also reflect the adopted regional transportation plan to ensure access to transportation funds. If adopting a circulation element that is not consistent with the regional transportation plan, that inconsistency and its impact on regional greenhouse gas reductions also should be discussed in the environmental analysis under the California Environmental Quality Act. (See, e.g., CEQA Guidelines § 15125(d).)

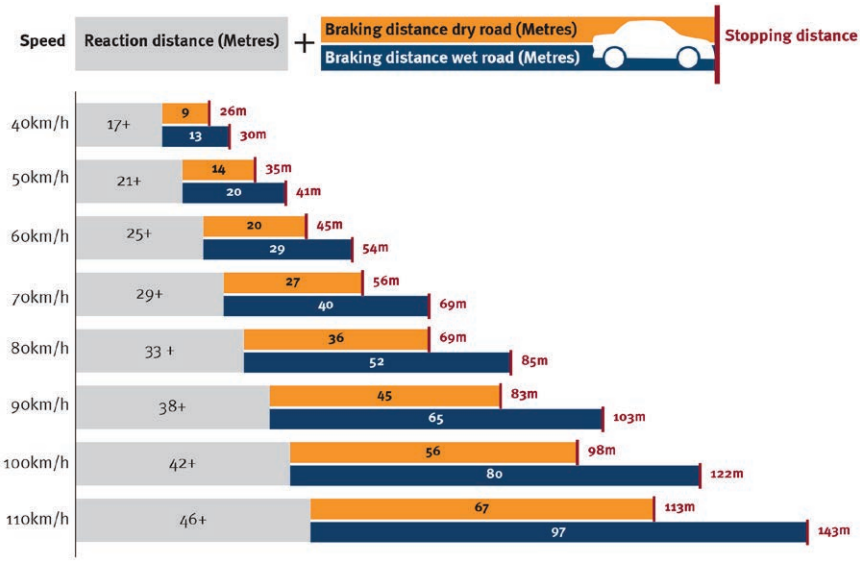
Correlation with the Land Use Element

Requirement Description:

Creating connected, accessible, and complete systems of circulation networks and ensuring access to opportunities within a community and region requires coordination between land use and circulation planning. Due in part to the connection between transportation funding and greenhouse gas reduction established in SB 375, vehicle miles traveled (VMT) is an increasingly important metric of impact in the circulation element. Because the circulation element is required to correlate with the land use element, it should account for the features of the particular community. For example, the circulation element can demonstrate

connectivity between residential uses, services and employment centers. Lack of transportation options from identified disadvantaged communities to essential destinations, such as grocery stores, may be improved through circulation (e.g. working with transit provider to increase transit frequency) or land use (e.g. new commercial development). Mapping transportation options as part of the general plan process may help identify gaps to address. The land use and circulation elements are useful places to plan for equitable access for all community members. Pedestrian and bicycle routes in the circulation element should connect residential areas identified in the land use element with jobs centers, parks, schools, and other destination centers. Truck routes should be directed away from noise- and emissions-sensitive residents and designated instead to serve areas designed for commercial and industrial uses in the land use element. The design speed of a roadway should equal its target speed (in other words, a street should be designed to accommodate intended auto speeds, not faster speeds).

Figure 4: How long a stop takes based on speed (driving an average family car)



Source: https://www.qld.gov.au/transport/safety/road-safety/driving-safely/stopping-distances

Regional Transportation Plans, SB 375, and Sustainable Community Strategies

The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) supports the State's climate action goals to reduce greenhouse gas (GHG) emissions through coordinated transportation and land use planning with the goal of more sustainable communities.

Under the Sustainable Communities Act, ARB sets regional targets for GHG emissions reductions from passenger vehicle use. In 2010, ARB established these targets for 2020 and 2035 for each region covered by one of the State's metropolitan planning organizations (MPO). ARB will periodically review and update the targets, as needed.

Each of California's MPOs must prepare a "sustainable communities strategy" (SCS) as an integral part of its regional transportation plan (RTP). The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. Once adopted by the MPO, the RTP/SCS guides the transportation policies and investments for the region.

Special attention should be paid to ensure that all transportation facilities are designed to be safe, accessible, and connected for all users. Simply putting a sidewalk or a bike lane on one street, for example, without a complete system that connects residents and destinations, may not address the needs of a community. Using context sensitive, flexible designs can help increase access for all users while improving overall conditions or addressing common issues such as storm-water runoff, air quality, and bicyclist and pedestrian safety. For additional information on the design of complete streets, see NACTO Street Design Guidelines and Caltrans Complete Street Guidelines.

As noted above, the circulation element and the land use element must correlate. One of the most recent appellate court cases addressing the correlation requirement explained:

> [T]he internal consistency and correlation requirements do not require a city or county to limit population growth or provide traffic management measures to ensure that its transportation infrastructure can accommodate future population growth. The Planning and Zoning Law (Gov. Code, § 65000 et seq.) does not require a city or county to avoid adverse impacts on transportation. Rather, the city has broad discretion to weigh and balance competing interests in formulating development policies.... *(Federation of Hillside & Canyon Assns. v. City of Los Angeles* (2004) 126 Cal. App. 4th 1180, 1196.)

In characterizing the correlation requirement, the same court explained that "the circulation element of a general plan must provide meaningful proposals to address changes reflected in the land use element, and the land use element must provide meaningful proposals to reflect changes reflected in the circulation element" (Ibid). A proposal is "meaningful" if the element identifies reasonably reliable funding sources (Id. at 1196-1197). An element that identifies proposals with no reasonable expectation of implementation (i.e., funding) is not meaningful, and therefore would not satisfy the statutory correlation requirement (Id.; see also *Concerned Citizens of Calaveras County v. Board of Supervisors* (1985) 166 Cal. App. 3d 90, 103).

Proposals should address not just capital costs, but also costs associated with operations and maintenance. Because the circulation element addresses both transportation and local public utilities, the statutory correlation requirement applies to utilities infrastructure as well.

Appropriate fiscal analyses should be prepared to support the conclusion that the circulation element is capable of supporting the land uses planned in the land use element. Certain transportation funds are tied to consistency with regional sustainable communities strategies, so consistency with regional plans should be part of this analysis.

Tools are available to allow comparison of total infrastructure costs and benefits across several build-out scenarios. These tools enable communities to make decisions regarding land use patterns with long-term infrastructure costs and benefits in mind. More information on these tools and how to use them is available here.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Examine potential policies for local implementation of SCS	Modal split rates, transportation emissions data, transit access maps
Identify gaps in network connectivity	Transit maps, bicycle and pedestrian infrastructure maps, major destinations, and residential centers

Major Thoroughfares

Requirement Description:

Consideration must be given in the general plan to the development and improvement of major thoroughfares, including future acquisitions and dedications, based on proposed land use patterns and projected demand. Cities and counties should consider the location and design of major thoroughfares in new developments, as well as street patterns (curvilinear, grid, modified grid, etc.), multi-modal use and safety, coordination with other infrastructure such as utilities, and relationships between destinations and transportation systems. Relationships between intended users of streets, including freight trucks, transit, automobiles, bicyclists, and pedestrians, should be considered. Design standards for local streets (including, but not limited to, width, block size, speed, and accommodation of parking and bicycle and pedestrian traffic) may also be included in the circulation element. Information on safety elements of design is available in Appendix B. Providing charging stations and alternative fuel stations can facilitate use of zero emissions vehicles, reducing air pollutants and greenhouse gas emissions.

Transportation Routes

Requirement Description:

The transportation system consists of means to transmit vehicles and people (e.g. roads, sidewalks), docks to station vehicles at their destination (e.g. parking lots, ports), and the vehicles themselves (e.g. busses, bicycles, cars). In developing a general plan, a jurisdiction should consider its overall objectives, and develop policies for each of these three components that support those objectives.

Local governments should coordinate transportation routes with larger regional route plans, such as regional or state freight plans, regional transportation plans, and regional transit corridors. Consideration of multiple modes as part of a transportation system, combined with data on projected needs and uses, and local land use data, may help prioritize routes based on community needs. For example, a county may designate a freight corridor to run parallel to existing regional transit lines, utilizing the same infrastructure where possible, and directing both away from sensitive land uses such as schools.

Roads

Requirement Description:

The underlying goal of transportation is to provide connectivity (also called "accessibility" or "access to destinations)." Connectivity is provided by mobility (increased speed) and proximity (reduced distance). The transportation system has traditionally been evaluated primarily through a mobility lens, measuring speed (e.g. via delay metrics like Level of Service). In addition, the primary focus of mobility has been on Automobile Level of Service (LOS), a localized (intersection or roadway segment) measure of auto-mobility. The Complete Streets Act of 2008, as well as recent changes in CEQA and congestion management law, highlight a need for circulation elements to have a broader focus that includes other modes.

Upon review of existing policies, many local governments may find that existing automobile LOS standards are not sustainable or even desirable. For example, a high automobile LOS may be too expensive to maintain, may be unsafe for non-auto users, and may force different uses to be spread so far apart that travel becomes inconvenient.

Ideally, going forward, the circulation element of the general plan will include a discussion of the transportation system designed using metrics that capture connectivity (the fundamental purpose of transportation) rather than mobility (just one facet of connectivity). Examples of such measures include number of jobs accessible within 30 minutes, number of retail destinations reachable in a ten-minute walk, and number of hospitals accessible by a 45-minute transit ride. Even where metrics like Level of Service are still used, local governments should consider the following ways to account for limitations:

- Use Level of Service during the planning process to size roadways, but not as a measure of individual project impacts.
- Level of Service should be balanced with other metrics when used, rather than triggering decisions by itself. Other metrics are needed to measure the efficacy, comfort and safety of other transportation modes, and to measure the proximity benefits conferred by infill development. It is important to estimate the cost of achieving any Level of Service threshold, in order to determine whether that threshold is fiscally feasible, and to identify, where possible, funding for long-term maintenance costs associated with building to any Level of Service thresholds.
- Set Level of Service thresholds in consideration of the tradeoffs between mobility and other goals. Accommodating automobile traffic has direct tradeoffs with greenhouse gas emissions, other emissions that affect air quality, pedestrian collision risk, and active mode share and the resulting public health benefits. It also leads to sparser land development patterns, creating indirect tradeoffs with consumption of agricultural land and sensitive habitat, energy use, water use, and water runoff affecting water quality and flood risk. A general plan should consider these tradeoffs when recommending a Level of Service objective.

Planning for safe transportation systems has often used LOS to attempt to streamline automobile flow, accommodating driver error in an effort to reduce crash rates. This method of planning for safety may not most effectively increase safety or protect all users of the system. Rather, proactive roadway design, reduced speeds, and reduction of overall VMT may be more effective. For more information on analyzing transportation safety impacts, see Appendix B.

Transit

Requirement Description:

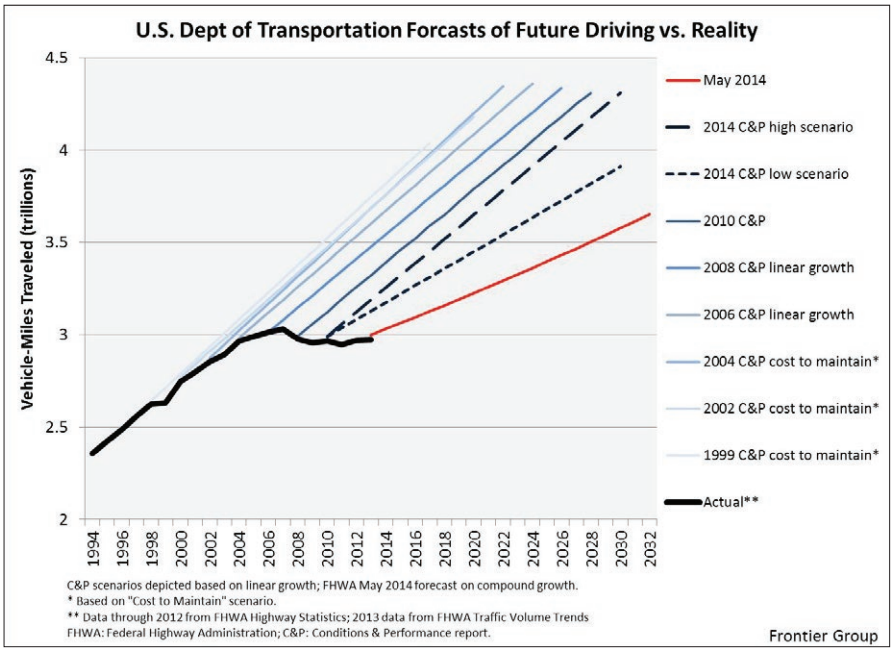
As more of the population chooses alternatives to driving, roadway capacity becomes filled, and California strives to reduce VMT and GHG emissions, transit availability becomes increasingly important. There are many important considerations for transit in general plans. Policies, such as increasing density around transit corridors and increased transit infrastructure, can promote and prioritize high quality transit, aligned with housing and economic development policies, which in turn increases efficiency of the overall transportation system. Promotion of equitable access to transit, through the analysis of available data to make decisions, can help ensure all community members have access to core destinations, such as employment centers, schools, and retail, and contribute to fulfillment of environmental justice requirements. Transit providers should be involved in general plan processes, ensuring their alignment with community priorities.

Well-planned transit infrastructure can improve access to opportunity by making job centers, housing, schools, and other major destinations accessible to a high numbers of residents. Providing infrastructure at transit stops for convenience and safety, such as proper lighting,

covered shelter, and safe crossings; implementing transit priority on streets and bridges, such as priority lanes, signals, and other types of infrastructure; and utilizing technology to communicate transit patterns in real time can help speed transit vehicles, shorten travel times, promote safety, and attract additional passengers.

Coordinating transit stops, stations, and routes with bicycle and pedestrian infrastructure can help create first and last mile connections, promoting reduced VMT for short trips and potentially increasing transit ridership for a greater range of residents.

Figure 5: People are choosing to drive less and less, at rates higher than expected



Source: Frontier Group http://www.uspirg.org/resources/usp/us-dept-transportation-forecasts-future-driving-vs-reality

Developers and employers can also incentivize transit ridership, and general plan policies can promote such programs through general visions and goals or through specific transit zones in the plan.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Assessment of potential needs for new transit routes	Maps highlighting residential centers, commercial centers, employment opportunities, schools, and recreation areas
Identifying potential targets areas for policies incentivizing transit use	Major employment centers, existing and planned transit routes, residential areas with demographic information

Active Transportation: Bicycle and Pedestrian Networks

Requirement Description:

The Active Transportation Program, enacted via Senate Bill 99 in 2013, funds pedestrian, bicycle, and Safe Routes to School programs (SRTS). This program ensures that at least 25% of investments benefit disadvantaged communities. Increasing safe, connected bicycle and pedestrian networks in a city or county improves health, economic mobility, GHG emissions, and increases accessibility for numerous populations. Ensuring that infrastructure is safe for residents from ages 8 to 80, if possible, captures the needs of recreational riders, ADA users, bicycle and pedestrian commuters, and all people in between. The Complete Streets Act (2008) requires cities and counties to plan for the development of multimodal transportation networks in the circulation element

of their general plan. Caltrans and NACTO offer guidelines on complete streets implementation. The Sustainable Communities and Climate Protection Act of 2008 (SB 375), promotes regional coordination of transportation and land use planning, including support of active transportation. Prioritizing more forms of active transport policies in general plans will strengthen potential for regional transportation plans to meet GHG reduction targets established pursuant to SB 375.

Safe Routes to Schools (SRTS)

Less than 15% of children living within a 2 mile radius of a school walk or bike to school, and over half are driven in vehicles. Recognizing the implications of these statistics for childhood health, worsening air quality, and congestion around schools, the Safe Routes to School program established in one jurisdiction in 1997 quickly became a model to promote safe, accessible routes to schools nationwide. With federal funding through the Transportation Alternatives Program, state funding, and programming across the US, SRTS promotes infrastructure, design, policy, and education to promote active transportation for children and parents. Many jurisdictions have incorporated SRTS into their circulation and land use elements, and the national partnership offers numerous resources and examples to help communities implement safe routes to school.

Bicycle and pedestrian networks should be complete systems for transportation, including coordination with land use plans, housing, and transit systems. Bicycle and pedestrian networks should connect residents to employment centers, community centers, schools, commercial districts, and transit stops. Active transportation can be used to fill the gap in transit systems- the first and last mile between transit stops and destinations. Promoting infill and TODs may create additional opportunities for active transportation by decreasing the distance between origins and destinations.

Circulation elements should promote equitable distribution of active transportation networks that link residents to key destinations, and ensure equitable allocation of infrastructure investments and maintenance. Where feasible given right of way restrictions, cost, and other limitations, protected or buffered bikeway should be prioritized to reduce injuries and promote biking. Paths and facilities, both on and off road, should include user amenities such as shade trees, benches, and drinking fountains. Complete Streets policies should be integrated into bicycle and pedestrian policies as well. Some jurisdictions have separate bicycle and pedestrian plans, which should correspond and align with the general plan.

Terminals

Requirement Description:

Airports, seaports, bus and train stations, and other terminals play an important role in a region's transportation, social, and economic makeup. As such, the circulation element should include these facilities in its transportation discussion, and include operators in the general plan process. Often, terminals bring a specific set of land use issues that may need to be addressed as future growth occurs in existing infill areas. These issues include pollution, noise, traffic, and public safety. The location, type, and height of development in areas surrounding airports, should be considered in the context of the local Airport Land Use Plan. Airport Land Use Plans must coordinate with general plans' land use elements, but should be considered in relation to circulation and safety as well. Some actions to consider in the circulation element include:

- Assess the adequacy of navigable waterways and port and harbor facilities, including the need for expansion and improvements.
- Project future demand based on new or expanded economic activities and recreational trends
- Assess the adequacy of and safety hazards associated with existing aviation facilities and the need for expansion and improvements.
- Limit potential noise and safety hazards posed by port activities to surrounding land uses
- Mitigate aviation-related hazards posed to and by aircraft
- Make access to and from aviation facilities available by all modes of transportation

Military Airports and Ports

Requirement Description:

The Department of Defense (DOD) has a significant presence in the State of California, using 10% of the State's land. Consequently, military ports and airports impose demands on local circulation infrastructure that should be factored into the overall analysis of local circulation planning in a general plan. Furthermore, changes to circulation patterns and routes may affect military operations. For example, development along formerly rural roads can significantly increase urban traffic and limit the use of routes for military transport purposes. Such changes can impede military operations, especially for units that commute to conduct training operations. On the other hand, improvements to circulation routes, such as ports, can contribute to operations. Additional information on military specific development can be found in the California Advisory Handbook for Community and Military Compatibility Planning.

Public Utilities and Facilities

Requirement Description:

In addition to transportation routes, the circulation element must identify the location and necessity of public utilities and facilities. Relevant utilities include water, sewers, storm-water systems, telecommunications and broadband, electric vehicle charging stations, electricity, and natural gas lines. These facilities relate directly to the land uses planned in the land use element, consequently, the circulation element should consider not just "right sizing" such infrastructure to serve only that growth that is actually planned in the land use element, but also placing infrastructure in areas that maximize efficiency and minimize impacts to the community. California courts have noted that plans for infrastructure should follow determinations regarding desired growth that reflect resource constraints and other broader considerations. (See, e.g., *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 949-950.)

"Dig once" policies can help ensure efficiencies and reduce costs among circulation infrastructure. The underlying premise of a "dig once" policy is to coordinate conduit construction with unrelated civil works projects, such as digging up the roads and sewer construction, to create a usable infrastructure for future network deployment/provisioning. Dig once policies are flexible and may

come in many forms. The goal and emphasis should be on impacting the rights of way as few times as possible by inviting multiple parties to lay their infrastructure together. While not always feasible, coordinating between circulation infrastructure agencies may help reduce costs and impacts on the local community. In identifying existing infrastructure and planning for future needs, local governments should work closely with any relevant service providers, including water districts, utilities and others.

Infrastructure needs of Disadvantaged Unincorporated Communities

In 2011, local governments were required to plan for infrastructure needs of disadvantaged unincorporated communities through Senate Bill 244. The bill requires the land use element to analyze needs for infrastructure in these communities. To ensure consistency, the circulation and land use elements' policies and programs should be coordinated. For additional information on planning for disadvantaged unincorporated communities, see the Land Use Element chapter of the GPG and Senate Bill 244: Land Use, General Plans, and Disadvantaged Communities Technical Advisory.

Broadband

Both state and federal governments are implementing various funding programs that serve the goal of expanding broadband access to unserved and underserved areas. Within California, the California Public Utilities Commission (CPUC) manages the California Advanced Services Fund (CASF), which invests hundreds of millions of dollars annually in broadband deployment. The state also created the California Emerging Technology Fund (CETF), which was designed to be a public-purpose venture capital fund.

Dig once policies can substantially reduce costs for providing broadband service to communities. A new provider can run fiber through leased conduit space at a fraction of the costs, incentivizing more private actors to deploy or reducing costs to the city if self-provisioning broadband services. For example, if conduit construction was promoted along ongoing civil work projects, fiber deployment costs drop by $30,000- $100,000 per mile. On average, 60 to 90 percent of network deployment costs come from civil works as opposed to equipment and maintenance.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Understanding transportation choices and multi-modal needs	Percentage of pedestrians and bicyclists commuting to work and other trips (National Household Travel Survey, California Household Travel Survey, American Community Survey)
Identifying necessary safety improvements	Number or % of injuries and fatalities (Transportation Injury Mapping System)
Analysis of existing and needed active transportation networks	Transit stops and centers, existing and planned bicycle routes, pedestrian facilities, destination centers

4

Other Considerations

Transportation and Climate Change

Transportation is a significant source of greenhouse gases. In California, transportation is the largest source of emissions: according to the California Air Resources Board, about 37% of the state's GHG emissions come just from vehicle tailpipe emissions,[i] as compared to 28% nationally.[ii] Considering life-cycle emissions (extraction, fuel refining, fuel transport, roadway construction, etc.) in addition to tail pipe emissions, transportation is the source of over half of California GHG emissions. An update to the circulation element presents an opportunity to integrate measures for reducing vehicle travel that are critical to meeting our State's GHG reduction goals.

Strategies to reduce transportation-related GHG emissions fall into three general categories: vehicle efficiency, switching to low-carbon fuels, and reduction of vehicle miles traveled. General plans' most important policy levers focus on VMT reduction, by setting out low-VMT land use patterns and specifying transportation network characteristics and travel demand management strategies. Further, general plans can help jurisdictions become "ZEV-ready", e.g. by specifying provision of alternative fuel fueling and charging stations.

Parking

Many general plans set forth the goal of providing their communities with "adequate parking." Historically, this has meant directing new land use projects to exceed the full demand for free parking. This has resulted in a substantial subsidy to automobile users of roughly $20-40 Billion per year in California.[iii] Free parking is a community choice, but should be recognized as one that entails costs and leads to additional vehicle travel, which in turn can impact community goals for livability, mode shift, environmental protection, emissions reduction, and fiscal benefits.

The circulation element of a general plan provides a jurisdiction the opportunity to evaluate various tradeoffs, including the costs and benefits of parking, in conjunction with other planning goals. Tradeoffs a jurisdiction might consider include:

- Parking demand may change over time due to numerous factors including adjacent land uses, densifying urban development, transit and active transportation infrastructure, and emerging vehicle technologies such as automated vehicles
- Ready parking availability can induce increased vehicle miles traveled (VMT), leading to increased traffic and greenhouse gas emissions.
- Parking requires land that might be occupied by other land use, which may provide greater benefit (including fiscal benefit).
- Parking areas paved with standard asphalt can exacerbate impacts on water quality and runoff control.
- Free parking subsidizes drivers at the expense of transit users, pedestrians, and cyclists.

Many jurisdictions are already confronting parking tradeoffs and addressing these issues by managing parking demand and parking supply.

Managing Demand for Parking

- Support alternative transportation. Travelers by non-auto modes do not require automobile parking. Quality bicycle, pedestrian, and transit access facilities and services (See e.g. City of Berkeley), and development proximate to those facilities, reduce motor vehicle mode share and therefore parking demand. Adequate, convenient, and secure bicycle parking, including around transit stations, facilitates cycling and increases cycling mode share.
- Convert parking to parklets, which increase public space and can improve neighborhood vibrancy.
- When providing on-street parking, design it in a manner that calms traffic and enhances bicycle and pedestrian safety and comfort. This may include reverse angle parking and parking-protected bicycle lanes.
- Attach a cost to parking. Construction and maintenance of parking is costly. Jurisdictions may wish to consider the benefits of optimizing parking prices to reflect the equilibrium between supply and demand, to help improve traffic flow, or to reduce VMT and GHGs. (See e.g. City of San Diego; City of Sacramento) Further, fees collected can be reinvested in a number of ways, including neighborhood benefits districts, that can increase neighborhood vibrancy.

Increased bicycle and pedestrian infrastructure, including shade, pathways, and safety features, help promote activity

Image by Urban Advantage, Cunningham Quill | Architects

Managing Supply of Parking

- Remove minimum parking requirements. Parking restrictions, such as residential parking permit programs, can be implemented to prevent spillover parking. Parking provision can be left to the market, pricing can be deployed, or parking maxima can be provided.
- Set parking maxima. Especially in TOD or mixed-use development areas, establishing maximum parking requirements instead of minimum requirements will mean that space is available for other uses (See e.g. Sacramento County; City of San Jose).
- Manage the use of existing spaces rather than provide additional parking. Prioritize spaces based on location (e.g. proximity to employment centers) and intended use (e.g. short- or long-term). Implement shared parking or establish parking benefit districts. (See e.g. Sacramento County) Optimizing use of existing parking will help make efficient use of land within the jurisdiction's boundaries.

Traffic Control Around Schools

High volumes of pedestrian traffic, vulnerable users, and other factors create increased need for safety around schools. Considerations in roadway design should take in to account the specific needs of the population, including bicycle and pedestrian access, transit and drop off needs, and safety around crosswalks, intersections, and roundabouts. The Safe Routes to Schools National Partnership, with support from CalTrans' Safe Routes to School program, provides guidance and resources for improving traffic control around schools, including signage, pavement markings, signals, and other infrastructure. For additional guidance on traffic control specifically around schools, see the CalTrans Manual on Uniform Traffic Control Devices, including Section 3c on roundabout markings and Part 7 for traffic control around schools.

Addressing Tradeoffs and Maximizing Co-benefits in Circulation

The transportation network should be designed to accommodate multiple competing interests, as well as to maximize co-benefits. Potential areas for co-benefits, such as safer streets through slower traffic, greater economic activity through improved walkability, and increased positive health outcomes through improved active transportation, should be considered in making decisions around transportation.

The circulation element should address the tradeoffs between various interests rather than listing desirable but mutually exclusive outcomes. The following are some of tradeoffs that a circulation element might address. Some of these tradeoffs will involve agencies distinct from the city or county, such as some transit systems, highlighting the importance of coordination between stakeholders involved in circulation planning and implementation.

- Roadway motor vehicle throughput and speed v. impacts on community along roadway
- Roadway motor vehicle throughput and speed v. capacity for other modes

Aligning circulation and land use improves access and creates economic opportunities

Image by Urban Advantage, Clarion

- Roadway design speed and risk to pedestrians and cyclists
- Breadth of coverage of transit system v. cost
- Provision of bicycle facilities v. provision of additional motor vehicle capacity
- Transit priority measures (e.g. signal priority and queue jump lanes) v. automobile capacity
- Accommodation of potential emergency vehicle turning movements v. design for pedestrian safety
- Accommodation of freight vehicles v. pedestrian safety
- Automobile throughput and speed v. traffic calming measures such as narrower travel lanes, roundabouts, raised medians, speed tables, small curb radii, etc.)

Goods Movement

Freight movement is essential for any community to thrive, by allowing the exchange of needed goods and stimulating local and regional economies. Depending upon geography and community characteristics, local governments should plan for goods movement in multiple modes, including air, rail, ship, and truck. A general plan should address transportation improvements that facilitate the timely movement of goods, meet the needs of local business and industry, and support the efficient transfer of goods between truck, rail, and other transportation modes. These interests of goods movement must be balanced with the trade-offs that may include negative impacts to safety, air quality, and noise described in the previous paragraph. Increasing general purpose roadway capacity on a congested roadway may not facilitate freight vehicle travel, due to induced travel effects (mostly passenger vehicles); freight-only facilities may better accomplish this objective.

While freight moves throughout the state in multiple ways, trucks specifically:

- Emit diesel particulate matter (DPM), which is a localized pollutant that is particularly hazardous to human health
- Generate high noise levels
- Pose special collision hazards because of their size, especially to vulnerable road users, and especially during turning movements, where rear wheels can follow a shortcut-track and collide with pedestrians and cyclists

For these reasons, truck routes should be designed to minimize risk to areas containing concentrations of sensitive receptors and vulnerable road users. Also, goods movement facilities (distribution centers, rail yards, and ports) should be placed in locations that do not bring high levels of truck traffic near residential areas or schools whenever possible. Engaging school boards, goods distributors, and community members to coordinate the land use element with the circulation element, freight mobility plans, and other relevant efforts may help assess tradeoffs and needs in locating facilities.

Land use and circulation elements may also be coordinated for freight movement in congested or high traffic corridors, such as by designating specific freight zones, lanes, or management practices, to improve efficiency overall. Policies specific to the needs of a community, depending on factors such as density, proximity to goods movement facilities, and average daily traffic (vehicle and non-vehicle) may help ease safety and congestion issues associated with urban freight movement.

Congestion Management Plans

Each county that includes an urbanized area must establish a congestion management agency to prepare and adopt a congestion management plan (Gov. Code §65089). The congestion management plan establishes programs for mitigating the traffic impacts of new development, including deficiency programs where congestion is extreme, and monitoring the performance of system roads. The congestion management plan is expected to link land use, transportation, and air quality concerns. At a minimum it must include all state highways and all principal arterial roads. Performance of the congestion management plan is measured through the land use approval process.

As noted above, many jurisdictions have traditionally focused their circulation elements on automobile transportation, planning to certain "level of service" standards. It is important to note, however, that congestion management law does not require general plans to designate level of service standards for every roadway and intersection, only for the "system of highways and roadways designated by the agency," with special considerations for infill opportunity zones. In fact, there are many reasons that a circulation element should not do so, as noted in this section. Moreover, congestion management plans address far more than just automobile transportation. They must also include an evaluation of the performance of multiple modes of travel and provide a program for travel demand management. Notably, projects identified in a congestion management plan must be consistent with the regional transportation plan, and its sustainable communities strategy, in order to be funded (Gov. Code § 65082). In updating a circulation element, therefore, a local government must put the congestion management plan in a context that includes reductions in vehicle miles traveled, and provides for multiple users of the transportation system, including transit, bicycles and pedestrian transportation.

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate. A full list of recommended policies can be found here.

Sample Policy	Example of Application	Relationship to Other Elements
[City, county] shall design intersections and public right-of-ways to include adequate and safe access for all users including pedestrians, bicyclists, and motorists of all ages and abilities.	San Pablo	Land use, safety, equitable and resilient communities, economic development
[City, county] shall balance commercial goods movement with the health and quality of life priorities of the community by routing heavy truck traffic away from residential zones and promoting safety at rail crossings.	San Pablo	Land use, safety, air quality, equitable and resilient communities, healthy communities
[City, county] shall limit parking within the public right of way based upon considerations of safety, street width, visibility and access to properties	San Pablo	Land use, healthy communities, safety
[City, county] shall establish travel demand management programs to reduce peak-hour traffic congestion and help reduce regional vehicle miles traveled	San Pablo, Pasadena	Air quality, healthy communities, equitable and resilient communities, economic development, climate change
Incorporate Americans with Disabilities Act (ADA) requirements throughout the [city, county], but especially in high-volume pedestrian areas.	City of El Monte	Healthy communities, economic development, equitable and resilient communities
[City, county] shall create indoor air quality guidelines for residential and commercial units located along higher density corridors and areas where increased intensity of use may result in higher levels of vehicular traffic on adjacent streets. Identify recommendations for mitigation, including design standards and public transportation	City of Richnond	Land use, air quality, equitable and resilient communities
[City, county] shall provide safe routes to school for children and families walking, bicycling, and taking public transportation to schools in the community	City of Santa Cruz	Land use, healthy communities

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Housing Element

Introduction

Providing adequate housing for all residents is a priority for cities and counties throughout California. The housing element implements the declaration of State law that "the availability of housing is a matter of vital statewide importance and the attainment of decent housing and a suitable living environment for all Californians is a priority of the highest order" (Gov. § Code 65580). Provisions in the housing element are more specific and directive than other elements, and contain detailed guidance and reviews. The law also provides the Department of Housing and Community Development (HCD) with unique authority over the housing element.

Housing element updates must be consistent with other general plan elements, including the land use element and diagrams. Integrating considerations of general plan goals and policies through the housing element and each update may improve efficiency by ensuring consistency. Additionally, incorporating a holistic view of the document will allow the housing element to compliment other elements in addressing challenges such as climate change mitigation and adaptation, and working towards local goals, such as promoting infill development, Transit Oriented Developments, and healthy, safe, and equitable communities.

Periodic updates assure that local governments "will prepare and implement housing elements...toward the attainment of the state housing goal" (Gov. Code §65581). The law requires that HCD review and certify the housing element and that local jurisdictions submit annual progress reports to HCD. The housing element must be revised and submitted periodically on a four, five, or eight year cycle, depending on various factors (Gov. Code §65588). See the HCD's website for a schedule of statutory deadlines. Specific questions about update cycles and related housing element requirements should be directed to HCD and the HCD website. These Guidelines provide a general overview of the housing element, with links to more detailed information. Because of the more precise requirements applicable to the housing element, users should consult the detailed requirements for each section (following the links provided), including specificity and timelines.

CORRELATIONS AMONG ELEMENTS

	Land Use	Circulation	Conservation	Open Space	Noise	Safety	EJ
Housing	IN STATUTE	RELATED	RELATED	RELATED	RELATED	RELATED	IN STATUTE

■ Identified in statute ■ Closely related to statutory requirements

Completeness Checklist

Local agency staff can use the following checklist to help ensure that the housing element addresses all required issues. Please note that use of this checklist is advisory, and only contains issues that are legally required in Government Code section 65583. Housing elements may include additional content at the discretion of the local jurisdiction. For example, the housing element is well suited to address requirements related to environmental justice and disadvantaged unincorporated communities. Because general plan formats may vary, this checklist suggests identifying where the particular government code provision is satisfied.

Statutory Citation	Brief Description of Requirement
Gov. Code §65583(c)(8)	Public Participation: description of diligent effort to include all economic segments of the community
Gov. Code §65588	Review and Revise: • Progress in implementation • Effectiveness of the element • Appropriateness of goals- objectives, policies and programs
Gov. Code §65583(a)(1 and 2)	Housing Needs Assessment: Quantification and analysis of existing and projected housing needs Populations and employment trends, including documentation of projections Housing and Household characteristics, including; • Level of payment compared with ability to pay (overpaying households) • Housing stock conditions • Overcrowded households Existing and projected needs for all income levels, including: • Regional Housing Need Allocation (RHNA) • Existing housing need for extremely low income households • Projected housing need for extremely low income households based on RHNA or Census
Gov. Code §65583(a)(7)	Persons with Special Needs: Identification and analysis of any special housing needs including: • Elderly • Persons with disabilities, including developmental disabilities • Large Households • Farmworkers (seasonal and permanent) • Female headed households • Homeless (annual and seasonal) • Other
Gov. Code §65583(a)(9)	At-risk Units: Inventory of at-risk units (10 years from the housing element due date) • Estimate of replacement versus preservation costs • Identification of qualified entities • Identification of potential funding
Gov. Code §65583(a)(5 and 6)	Potential Governmental Constraints: Include an analysis of actual and potential governmental constraints for each of the following: • Land use controls • Building codes and their enforcement • Site improvement requirements • Fees and other exactions • Local processing and permit procedures • Housing for persons with disabilities • Transitional housing and supportive housing as a residential use of property and subject only to those restrictions that apply to other residential dwelli ngs of the same type in the same zone
Gov. Code §65583(a)(5 and 6)	Potential Non-governmental Constraints Include an analysis of actual and potential non-governmental constraints for each of the following: • Availability of financing • Price of land • Cost of construction

Statutory Citation	Brief Description of Requirement
Gov. Code §65583 (a) (3) and 65583.2	Sites Inventory and Analysis: • Listing of properties by parcel number or other unique reference showing for each parcel • General description of environmental constraints to the development of housing • General description of infrastructure (planned/available) including water, sewer and other dry utilities, including availability and access to distribution facilities • For Non-vacant sites, specify the additional development potential for each site within the planning period and provide an explanation of the methodology to determine development potential • Demonstration of zoning to accommodate the housing need for lower income households • Map of sites included in the inventory • Number of units built between the start of the projection period and the deadline for adoption of the housing element (optional) • Number of units proposed using alternative provisions such as rehabilitation, conversion, preservation or accessory dwelling units (optional) • Analysis of whether inventory provides for a variety of housing types (Multifamily rental housing, Factory-built housing, Mobile homes, Housing for agricultural employees, Emergency Shelters, Transitional and supportive housing) • Carryover obligation (AB 1233), if applicable
Gov. Code §65583(b) and (c) (1 through 6)	Quantified Objectives and Housing Programs: Provide statement of quantified objectives; Maximum number of units, by income group, including extremely low-income of: • New construction; • Rehabilitation; and • Conservation.
Gov. Code §65583(c)	Include programs with: • Schedule of specific actions; and • Timeline for implementation with a beneficial impact in the planning period; and Identification of agencies and officials responsible for implementing each program.
Gov. Code §65583(c)(1)	Program(s) providing adequate sites: • Programs to rezone and any other programs needed to address a shortfall of sites to accommodate the regional housing need, if applicable, and any programs included pursuant to Section 65583.2(h) and (i) or carryover obligation pursuant to Section 65584.09. • Programs to rezone and any other programs needed to address a shortfall of capacity for housing for farmworkers that could not be accommodated on sites identified in the inventory, if applicable. • If applicable, programs to facilitate a variety of housing types, including multifamily rental, factory-built housing, mobile homes, housing for agricultural employees, supportive housing, single room occupancy, emergency shelters and transitional and supportive housing.
Gov. Code §65583(c)(2)	Programs to assist in the development of housing for extremely low, very low, low and moderate income households.
Gov. Code §65583(c)(3)	Programs to address governmental constraints and where appropriate and legally possible, to remove constraints to the maintenance, improvement and development of housing.
Gov. Code §65583(c)(3)	Program to remove constraints on housing for persons with disabilities and provide reasonable accommodation for housing for persons with disabilities.
Gov. Code §65583(c)(4)	Program(s) to conserve and improve the condition of the existing affordable housing stock.
Gov. Code §65583(c)(5)	Program(s) to promote housing opportunities for all persons.
Gov. Code §65583(c)(6)	Program(s) to preserve at-risk units.
	Other Requirements
Gov. Code §65583 (c) (7)	Description of general plan consistency.
Gov. Code §65585	Review by HCD and legislative body.
Gov. Code §65588	Analysis of construction, demolition and conversion of housing for lower income households in the Coastal Zone.
Gov. Code §65583 (a) (8)	Description of opportunities for energy conservation in residential development.
Gov. Code §65589.7	Water and Sewer Priority See the HCD Memo at http://www.hcd.ca.gov/hpd/memo_sb1087.pdf. *
Gov. Code §65589.5	Housing accountability act; analysis for rejection.

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Required Contents

State law requires the housing element to address particularly detailed statutory requirements. For more information on these requirements, see the HCD's website. A housing element must generally include the following parts, which are described in further detail below and through links:

- Review of previous element
- Housing needs assessment
- Inventory and analysis of adequate sites
- Analysis of potential governmental and non-governmental constraints
- Housing policies and programs
- Quantified objectives

Planning and Zoning Law also requires planning agency staff to: 1) collect and compile public comments regarding a proposed housing element; and 2) provide the comments to each member of the legislative body prior to adoption (Gov. Code § 65585(b)(2)). The scope of the housing element requires a strong relationship to other elements of the general plan, and linkages between sections should be taken in to consideration. The housing element should integrate community health, climate change, and other considerations affecting and affected by housing throughout each section. More information on additional considerations is presented at the end of this chapter.

Public Engagement:

Housing issues affect the entire community, and can be confusing and contentious. The public participation requirement of housing element law presents an opportunity to engage constituents in a dialogue – defining problems and creating solutions. Public participation should include community stakeholders, including residents, and examine how different housing strategies are identified, evaluated, developed, and implemented. An inadequate public participation process may lead to community conflict or anti-development initiatives. Public engagement strategies to address multiple communities are outlined in Chapter 3 of these Guidelines. The housing element must document how outreach and public engagement is carried out, from planning through implementation (Gov. Code § 65583(c)(7)). This documentation should include current and future plans to involve a cross-section of the community in the full process.

Review and Revise:

The review and revise requirement is an important feature of the housing element update. A review facilitates a comprehensive update and ensures that the housing element can be effectively implemented in the next planning period (Gov. Code § 65588). Review and revise requires analysis in three areas:

Progress in implementation: A description of the actual results or outcomes of the prior element's goals, objectives, policies, and programs. The results should be quantified where possible (e.g., number of units rehabilitated) and may be qualitative where necessary (e.g., mitigation of governmental constraints).

Effectiveness of the element: An evaluation of the effectiveness in achieving the objectives of each program, such as analyzing differences between what was projected or planned in the earlier element and what was achieved.

Appropriateness of goals, objectives, policies and programs: A description of what has been learned based on the analysis of progress and effectiveness of the previous element. A description of how the goals, objectives, policies, and programs in the updated element are being changed or adjusted to incorporate what has been learned from the results of the previous element.

Examples of review and revise analysis can be found here.

General Plan Consistency:

The goals, policies, and objectives and various accompanying analyses and text of the housing element must be reviewed in the context of the rest of the elements of the general plan such the land use, circulation, and open space elements (Gov. Code § 65300.5). The element must include a discussion of how internal consistency within the general plan has been achieved and how internal consistency will be maintained throughout the planning period (Gov. Code § 65583(c)(7)). If appropriate, other elements may need to be updated concurrently with the housing element.

Coastal Zone Requirements:

To assist a locality's determination of whether the affordable housing stock in the coastal zone is being protected and provided as required by Government Code Section 65590, the element must contain data on the new construction, demolition, conversion and replacement housing units for low- and moderate-income households within the coastal zone.

Based on this analysis, localities should consider appropriate programs to provide incentives and regulatory concessions in order to preserve housing for low- and moderate-income households within the coastal zone. See also the Coastal Act section of the GPG.

Aligning transportation and land use increases access and vibrancy for all residents

Image by Urban Advantage, Santa Clara Valley Transportation Authority

Internal Consistency in Updates:

Updates to other sections of the general plan often require a review of land use, with consideration to the potential impacts to existing housing stock and the housing element land inventory. For example, should the update of these elements demonstrate that certain parcels within the community would not be able to be developed or require significant mitigation; the sites inventory of the housing element should be updated to reflect these constraints. As a result, new parcels to accommodate the Regional Housing Needs Allocation (RHNA) may need to be identified.

Land Use Element:

Government Code section 65302.10(a) requires that each city and county review and update the land use element of its general plan, based on available data, including, but not limited to, the data and analysis developed pursuant to Government Code section 56430, of unincorporated island, fringe, or legacy communities inside or near its boundaries.

Safety and Conservation Elements: Government Code Section 65302 requires amendment of the safety and conservation elements of the general plan to include analysis and policies regarding flood hazard and management information. In addition, the safety element must be updated to analyze risk and include policies for the protection of the community from any unreasonable risks associated with the effects of wildland and urban fires.

Environmental Justice Element:

Government Code Section 65302(h) (1) requires cities and counties with identified disadvantaged communities to create an environmental justice element, or related goals, policies, and objectives integrated in other elements. The environmental justice element must include objectives and policies to promote safe and sanitary homes.

> Neighborhood-based Policies and Programs: Some jurisdictions will evaluate household and housing characteristics at a neighborhood level to target funding and other programs. For example a jurisdiction could evaluate housing conditions at a neighborhood level to target revitalization efforts or consider tenure and income to better utilize resources for conserving and improving affordable housing stock.

Analysis of Existing Housing Needs

Requirement Description:

An assessment of existing housing needs must include an analysis of population and employment trends and documentation of projections and a quantification of the locality's existing and projected housing needs for all income levels, including extremely low-income households (Gov. Code §65583(a)(1and 2)). The assessment must also include an analysis of household characteristics such as tenure (whether renting or owning) and overpayment; housing characteristics such as overcrowding; and housing stock conditions. The purpose of the assessment is to evaluate existing housing needs to formulate appropriate policies and programs. The assessment can be combined with other areas of the housing element such as evaluation of past programs and comments through public participation. An assessment of housing needs can utilize a variety of quantitative and qualitative information and should use current information when available. An assessment may also evaluate trends over time and consider information or maps at a

neighborhood level to better formulate appropriate policies and programs to address existing housing needs in the planning period. Items that must be included, as well as links to more information, are discussed below. The HCD website includes detailed information on housing elements as well as examples, tools, and resources for updating the element. As with all elements of the general plan, the required items provide a base, and jurisdictions can add other considerations as appropriate for their community.

Population and Employment:

In order to understand and prepare for the housing needs of a community, population trends and demographics, including employment trends and needs, must be assessed. The analysis should include current population and employment industry trends, using the most recent Census data available; comparisons in growth rates to countywide and regional rates; and analysis of population by age and other demographic characteristics. Employment analysis should examine shifts and anticipated shifts in employment and the potential impact on the housing market; identification of large employers, job types, and earnings; and analysis of potential methods for improving job-housing relationships.

Existing Housing Needs, Including Extremely Low-income Households:

The element must include a description of existing households by income level, including a specific quantification and analysis of extremely low-income (ELI) households, defined as households with income at 30% or below of area median. Analysis of existing housing needs should include an estimate of existing and projected households with ELI, as well as proposed actions to address identified needs (Gov. Code §65583(a), 65583(c)(2)).

The analysis should assess the resources available to address the housing need, such as the kind of housing available and suitable for ELI households (including Supportive Housing and Single-Room Occupancy [SROs] units) and whether existing zoning permits those housing types.

ELI households often need additional assistance outside of market mechanisms, and may require specific housing solutions such as deeper income targeting for subsidies; housing with supportive services; single-room occupancy (SRO's) and/or shared housing; and rent subsidies (vouchers).

Housing Data

Data for the housing needs assessment may be obtained from many sources. The US Census, American Community Survey (ACS), the Department of Finance and Employment Development Department are the most common data sources for population and employment trends. These data sources can also be used to quantify the number of those living in overcrowded housing conditions, as well as those overpaying for housing. Overpayment data may also be found by utilizing HUD's Comprehensive Housing Affordability Strategy (CHAS) data. Data for at-risk housing can be found via the California Housing Partnership Corporation (CHPC), and data on housing stock conditions may be found by using local sources like a windshield survey or local building department. Many of these data sources are available in one comprehensive site via the General Plan Mapping Tool. Jurisdictions should augment the tool with additional data available locally.

Housing and Household Characteristics

Housing and household characteristics must be assessed in line with population and employment to determine current and future needs for homes available to renters and owners (Gov. Code §65583(a)). A quantification and analysis of household characteristics addresses the number of households and trends and evaluates various factors such as tenure and the level of payment compared to their gross income or the ability to pay (overpayment).

An analysis of overpayment must identify and analyze the number of lower-income households, by tenure, paying more than 30 percent of their gross income for housing and the number of households who pay 50 percent or more of their gross income for housing (Gov. Code §65583(a)). Where possible, the analysis should also identify households most significantly impacted by cost burdens (large families, seniors, etc.). The analysis should also identify potential resources and programs to address the need.

A quantification and analysis of housing characteristics must address housing stock conditions and overcrowding to help determine housing need, potential health impacts, and possible reduction of affordable housing. The analysis can also address a variety of characteristics related to housing such as housing units by type (e.g., single family, multifamily, manufactured housing) and their conditions, housing units by age, vacancy rates, rent and sales prices, and the development patterns of the housing stock by various characteristics.

Analysis of Projected Housing Needs

Requirement Description:

The housing element process begins with HCD allocating a region's share of the statewide housing need to the appropriate Councils of Governments (COG) based on Department of Finance population projections and regional population forecasts used in preparing regional transportation plans (Gov. Code §65583(a)(1)). The COG develops a Regional Housing Need Plan (RHNP) allocating the region's share of statewide need to the cities and counties within the region. The RHNP is generally required to promote objectives that align with the state's priorities, including increasing the housing supply and the mix of housing types, tenure, and affordability in all cities and counties within the region in an equitable manner; promoting infill development and socioeconomic equity, the protection of environmental and agricultural resources, the encouragement of efficient development patterns; and promoting improved intraregional relationship between jobs and housing. The RHNP should align with the region's Sustainable Communities Strategy (SCS), utilizing infill development plans, development around transit and active transportation, and other policies to reduce GHG emissions and enhance sustainability.

Analysis of Special Housing Needs

Requirement Description:

Statutes require an analysis of specific categories of persons with special housing needs, including the elderly; persons with disabilities, including developmental disabilities; large families (households with 5 or more persons); farmworkers; families with female heads of households; and families and persons in need of emergency shelters. Each of these analyses must include detailed quantitative

and qualitative data, including estimates of the number of persons in each category, discussions of available and needed resources, identification of housing types and numbers, and analysis of specific needs for identified categories (Gov. Code §65583(a)(7)).

Additional considerations and categories should be identified by each community and analyzed as appropriate. These may include transitional housing, assisted living, homelessness, and any other special housing needs specific to the jurisdiction. Consideration of homelessness specifically may affect estimates of needed housing. The need for emergency shelter must be assessed based on annual and seasonal need, and may be reduced by the number of supportive housing units that are identified in an adopted 10-year plan to end chronic homelessness. To be credited toward the need, these supportive housing units must be either vacant or have funding identified for construction during the planning period.

For assistance with the analysis of housing needs, including a discussion of resources such as existing housing, services and needs, cities and counties should contact local service providers. These include continuum of care providers, local homeless shelter and service providers, food programs, operators of transitional housing programs, local drug and alcohol program service providers, county mental health and social service departments, local Salvation Army, Goodwill Industries, churches and schools. Additional information on local services and needs may also be available by contacting one of 15 countywide Designated Local Boards certified by the HCD's Emergency Housing and Assistance Program.

Sites Inventory and Analysis

Requirement Description:

Local governments must prepare an inventory of land suitable for residential development, including both vacant and non-vacant sites, and an analysis of the relationship of zoning and public facilities and services to these sites (Gov. Code § 65583(a)(3) and 65583.2). The inventory must address the following components:

Inventory of Land Suitable for Residential Development:

The land inventory must identify specific sites suitable for the development of housing within the planning period that are sufficient to accommodate the jurisdictions share of the regional housing need for all income levels (Gov. Code § 65583). Land suitable for residential development includes vacant sites zoned for residential use, vacant sites zoned for nonresidential use that allow residential development, residentially zoned sites capable of being developed at a higher density, and sites zoned for nonresidential use that can be redeveloped for, and as necessary, rezoned for, residential use. The inventory may also list sites by characteristics such as city owned, proximity to services and amenities, infill and equity opportunity areas, transit and other priority development areas and areas potentially eligible for CEQA streamlining. Access to resources, including water, should also be considered (Pub. Resources Code § 21094.5, 21155.1-21155.4; CEQA Guidelines § 15183.3).

Analysis of Sites and Zoning:

The site specific listing must be accompanied by analysis to demonstrate that the land is suitable for development in the planning period and sites and zoning are sufficient and appropriate to accommodate the jurisdiction's share of the regional housing need for all income levels. This analysis should include whether the impacts of a changing climate will affect the suitability of sites and

Targeting Opportunity Sites

One purpose of the site listing is to allow the housing element to function as a working land use document, showing the community and developers where the City intends to target its growth and accommodate households for all income levels. Some jurisdictions identify sites by various characteristics to focus evaluation, resources, incentives and other actions to promote their intended use. For example, some jurisdictions may denote sites within priority development areas, transit priority areas, downtown areas, city-owned sites, areas meeting proximity criteria for funding (e.g., distance to amenities, infill, etc.).

zoning by subjecting sites to risks such as fire, flooding, sea level rise, seismic activity, etc. More information on these risks can be found in the safety and climate change chapters. Including an analysis of sites identified by the previous housing element update, and the factors responsible for projected housing having been built or not built, may help jurisdictions plan with implementation in mind. The site inventory and analysis must be consistent with the land use element and accompanying diagram. Analysis of sites coordinated with other elements of the general plan, including land use, circulation, and open space, will help jurisdictions identify potential co-benefits toward their local goals. For example, identifying sites for higher density, mixed income, or low income housing near transit centers, active transportation routes, employment centers, services, or parks, may promote health and economic development, reduce GHG emissions and climate change impacts, and assist in affordability and quality of life.

Zoning for a Variety of Housing Types:

The analysis of sites must indicate whether the inventory can provide for a variety of housing types, including multifamily rental housing, factory-built housing, mobile homes, housing for agricultural employees, transitional and supportive housing, single-room occupancy units and emergency shelters. Providing development opportunities for a variety of housing types promotes diversity in housing price, style and size, and contributes to neighborhood stability by offering more affordable and move-up homes and accommodating a diverse income mix. Additionally, needs for housing types vary among jurisdictions, from high density needs in urban areas to smaller scale mid density rental housing, additional dwelling units, and other housing types in suburban and rural areas. Determining the analysis of a variety of housing types must account for a number of specific factors. This includes identification of zoning districts where each of the housing types are permitted, discussion of how development standards and processing requirements facilitate development of each of the housing types; and a description of capacity and its suitability to accommodate development or improvement opportunities

In addition, the statute provides flexibility to local governments in identifying sites to accommodate their share of the regional housing need (Gov. Code § 65583).

Adequate Alternative Sites:

Local governments can address up to 25 percent by income group of their adequate sites requirement, under prescribed conditions, including units that are substantially rehabilitated, converted from market-rate to affordable, or where the affordability of certain multifamily housing units are preserved.

Accessory Dwelling Units:

Local governments can address a portion of their adequate sites requirement through the provision of accessory dwelling units based on a number of factors including the number of accessory dwelling units developed in the prior planning period, community need and resources and/or incentives available that will encourage their development. Accessory dwelling units are a valuable housing type that can facilitate affordability for a variety of housing needs. For more information, see the HCD's website.

Jurisdictions may also use other alternatives to accommodate the regional housing need including units constructed since the beginning of the planning period, motel conversions, potential for manufactured housing on rural lots and sites with permanent housing on military bases undergoing closure or conversion.

Accessory Dwelling Unit Ordinance, Santa Cruz

In 2002, the City Council of Santa Cruz supported staff efforts to increase the pool of affordable housing by initiating a comprehensive strategy and implementation plan for promotion of accessory dwelling units which resulted in adoption of the Accessory Dwelling Unit Ordinance. The plan offered approximately a 1:1 match from city in lieu fees, lower interest mortgage loans, partial subsidy of wages for a construction training program for women, and credit for in-kind staff time funded through the competitive award of a state Sustainable Communities Grant from the California Pollution Control Financing Authority. The city produced manuals and design handbooks distributed at no cost. The two pronged benefit accruing to the city would increase rental housing opportunities and strengthen home owner's ability to retain ownership in an increasingly expensive housing market.

The ordinance reduced the uncertainty and risk of application denial, provided technical and design support, facilitated partial loan assistance at a pre-determined low interest tax rate (4.5% in 2002) and programmatic support through the city approval process. Permit fees were revised and reduced and waived for units deed restricted to low and extremely low income renters by depth of affordability. The city subsidized the wages of construction workers hired through the city's training program. The city has since determined how constraints might be further loosened.

Identification of Zoning for Emergency Shelters

Requirement Description:

Every jurisdiction must identify a zone or zones where emergency shelters are permitted without a conditional use or other discretionary permit (Gov. Code § 65583(a)(4)). The identified zone(s) must include sufficient capacity to accommodate the need for emergency shelter as identified in the housing element, EXCEPT that each jurisdiction must identify a zone(s) to accommodate at least one year-round shelter. Adequate sites can include sites with existing buildings that can be converted to accommodate need. Shelters may only be subject to development and management standards that apply to residential or commercial development in the same zone. However, local governments may apply written and objective standards that include maximum number of beds, off-street

parking based upon demonstrated need, size and location of on-site waiting and intake areas, provision of on-site management, proximity to other shelters, length of stay, lighting, and security during hours when the shelter is open.

For more information, see the HCD's technical assistance on zoning for emergency shelters.

Analysis of Governmental and Non-governmental Constraints

Requirement Description:

Governmental: The element must describe and analyze governmental constraints for impacts on housing such as costs, supply and approval timing and certainty (Gov. Code §65583(a)(5) and (6)). This analysis must include constraints in land use controls, codes and enforcement, on and off site improvement requirements, fees and exactions, processing and permit procedures, and housing for persons with disabilities. Other governmental constraints specific to localized areas should also be addressed as appropriate.

The analysis of potential governmental constraints must describe past or current efforts to remove them. Where the analyses identify that a constraint exists, program responses to address and mitigate or remove its effects should be included in the element.

Ordinances, policies, procedures, or measures imposed by the local government that specifically limit the amount or timing of residential development should be analyzed as a potential governmental constraint and mitigated where necessary. The analysis will vary depending on the nature of the measure. In general, the measure and its implementation procedures should be specifically described and analyzed as to the impact on the cost and supply of housing.

Non-governmental: The housing element must include an analysis of non-governmental constraints, including land prices, construction costs, and financing availability. Although nongovernmental constraints are primarily market-driven and generally outside direct government control, localities can significantly influence and offset the negative impact of nongovernmental constraints through responsive programs and policies.

Analysis of Energy Conservation Opportunities

Requirement Description:

The energy conservation section of the element must inventory and analyze the opportunities for energy conservation in residential development such as energy saving features, energy saving materials, and energy efficient systems and design for residential development (Gov. Code §65583(a)(8)). Planning to maximize energy efficiency and the incorporation of energy conservation and green building features can contribute to reduced housing costs for homeowners and renters, in addition to promoting sustainable community design. Such planning, development, and building standards can also significantly contribute to reducing greenhouse gases. Updated policies and programs can address a variety of factors related to energy conservation and even broader environmental goals such as climate change by highlighting the environmental significance and operational benefits of employing energy conservation in the siting, building and retrofitting of decent, safe and affordable housing.

Analysis of Assisted Housing At-risk of Converting to Market Rate Uses

Requirement Description:

The element must include a project inventory of assisted housing that could be converted to market rate rents because of expiration of affordability restrictions in mortgage and/or rental subsidy contracts (Government Code Section 65583(a)(9)). Thousands of publicly assisted housing units in California are eligible to change from low-income to market-rate housing during the next decade due to the termination of various government subsidy programs and/or restrictions on rental rates. These units, known as at-risk units, are a valuable source of affordable housing for families statewide and as a result, the housing element must include a detailed analysis and proactive policies and programs to preserve these at-risk units. The at-risk analysis must prepare an inventory of all units at-risk of conversion within 10 years of the beginning of the housing element planning period, assess the conversion risk, estimate and analyze the costs of replacement versus preservation for units at-risk in the current five-year planning period, identify entities qualified to preserve at-risk units, and specify financing and subsidy resources.

Quantified Objectives

Requirement Description:

Quantified objectives must establish the maximum number of housing units by income category that can be constructed, rehabilitated, and conserved over a five-year time period (Gov. Code §65583(b)).

Housing Programs

Requirement Description:

Local governments have the responsibility to adopt a program that implements the policies, goals and objectives of the housing element through their vested powers, particularly over land use and development controls, regulatory concessions and incentives, and the utilization of financial resources. SB 375 amended sections of housing law to include specific requirements, including timelines and consequences, referenced in these guidelines and described here.

Programs are the specific action steps the locality will take to implement its policies and achieve its goals and objectives. Programs must include a specific time frame for implementation to have a beneficial impact toward the goals and objectives during the planning period. Programs must also identify the agencies or officials responsible for implementation. Effective program descriptions also include immediate, short-term and long-term action steps, proposed measurable outcomes, objectives or performance measures, and specific funding sources, where appropriate (Gov. Code §65583(c)).

All housing elements must include programs to address the following six areas:

Adequate Sites: The sites inventory must demonstrate adequate site capacity with appropriate zoning to accommodate the regional housing need for all income groups. Where the analysis of a local government's sites inventory does not demonstrate sufficient suitable and appropriately zoned sites to accommodate the regional housing need by income level, the element must include a program to make sites available during the planning period with appropriate zoning and development standards including meeting specific statutory

Beneficial Impact: Programs must have a schedule of actions, each with a timeline, to have a beneficial impact on the goals and objectives of the housing element within the planning period. The purpose of the clarification is to ensure program effectiveness in addressing housing needs in the planning period to better assist in meeting the housing objectives, including the objectives of SB 375. Programs must include a definitive date or deadline, or benchmarks for implementation early enough in the planning period to realize "beneficial impacts" and successful program implementation within the planning period.

requirements such as permitting residential development without discretionary action and providing sites zoned for owner occupied and rental multifamily residential uses by right. In addition, sites shall be identified as needed to facilitate and encourage the development of a variety of types of housing for all income levels, including multifamily rental housing, factory-built housing, mobile homes, housing for agricultural employees, emergency shelters, and transitional and supportive housing. In coordination with other general plan elements, aligning siting of adequate sites with goals can help communities improve outcomes, such as promoting infill development to address affordability, climate change, and community health issues.

Infill development and circulation improvements can create lively communities for all

Image by Urban Advantage, Joint Venture: Silicon Valley Network

Assist in the development of adequate housing to meet the Needs of Extremely Low-, Low- and Moderate-income Households: Having assessed and identified the housing needs of extremely low-, very low-, low-, and moderate-income households, including special needs households, localities must employ a sufficient number of strategies to assist in developing adequate housing to meet those needs. To address this requirement, localities can utilize a variety of methods such as proactive outreach with the development community, assisting with funding and land acquisition, streamlining entitlement processes and providing concessions and incentives for development. Jurisdictions may also prioritize funding for certain income levels and special needs and focus efforts in priority growth areas.

Address and Remove Governmental Constraints: For each policy, procedure or requirement identified as a governmental constraint, the element must include programs to address and remove or mitigate the constraint.

Conserve and Improve the Condition of the Existing Affordable Housing Stock: The existing affordable housing stock is a valuable resource and the element must include programs to conserve and improve the existing affordable housing

stock. Improvement includes physical activities that improve the housing stock such as rehabilitation. Conservation includes both maintenance activity such as code enforcement in deteriorating buildings or in response to complaints and improvements to the housing stock such as weatherization programs which help reduce housing costs or other actions, policies or programs to conserve the affordability of housing such as a mobile home park preservation ordinance.

The housing element can be a tool to identify and address displacement issues by including policies and programs to replace lost affordable housing, conserve existing housing, encourage new opportunities, provide rental subsidies to existing families, and increase the competitiveness of affordable housing development through removal of governmental barriers, assisting with land assemblage, developing a land banking program, or requiring a set-aide for below market rate units.

Promote Housing Opportunities for All Persons: Since State and federal laws uniformly outlaw most kinds of housing discrimination, the local government's role is to identify program strategies that support and implement these laws and affirmatively further fair housing opportunities for all persons. Such strategies may include consultation with fair housing and counseling organizations in the community to document the incidence of housing discrimination, evaluation of the availability of services and identification of opportunities to promote housing and community development choices throughout the community. At minimum, a local equal housing opportunity program must provide a means for the resolution of local housing discrimination complaints and commitment to disseminate fair housing information and information about housing resources throughout the community.

Preservation of Units At-risk of Converting to Market Rate Uses: The nature of conversion risk varies significantly among projects depending on the type of subsidy and related affordability controls. When units are identified at-risk, the element must include actions to preserve the units such as monitoring, assisting with funding, outreach with developers, meeting noticing requirements and actions to assist tenants. Individual program responses should be tailored to the results of the analyses and specific local situations.

Innovation in Affordable Housing and Regional Housing Needs

Moylan Terrace, San Luis Obispo

The City of San Luis Obispo is the largest employment center in San Luis Obispo County, but many workers choose to live in more affordable surrounding communities. Moylan Terrace – an 80-unit for sale town home project – transforms an existing industrial/manufacturing area for smaller, affordable housing units close to downtown, in the Broad Street Corridor. Tandem parking, variable street setbacks and reduced parking and greater height allow for 24 du/ac. Form based coding encourages density and mixed use residential close to public transit, bike lanes and within walking distance of employment centers. Small by design with efficiencies 28-32% above California energy code requirements, the buildings house structurally independent units in an auto court layout have individual entry off of landscaped courtyards.

The land had been purchased a decade ago by the Housing Authority and held for affordable housing. The City provided a long term forgivable loan to cover impact fees, a direct transfer of in-lieu fees from a separate local development, and will again transfer profits upon sale forward to the next affordable housing project under construction in the city. The Inclusionary Housing Program screens applicants intending to insure occupancy over speculative ownership, with an equity gain back to the Housing Authority IHP if a unit does not go to another low income borrower upon resale.

Parc on Powell, Emeryville

Just north of Oakland and directly across the Bay Bridge from San Francisco, Emeryville grew 46% between 2000 and 2010, with double digit growth projected. The city adopted an Affordable Housing Set Aside program in 1990. Parc on Powell received 900 applications for 36 below market rate units. The site is in a transitional area between medium density residential development to the east and mixed use to the west, and is within a one mile radius of shopping including grocery stores, restaurants, two schools, a walking trail, Amtrak station and bus service, a post office and three public parks.

The 166 unit project includes studio, one-, two- and three-bedroom apartments, live/work units and flexible units with 22% units affordable to renter households below 120%. Density bonus, parking, height and setback concessions allowed a density of 71 units in a 45 du/acre zone. The project repurposed an historic building, and incorporates a municipal recycled water system, highly efficient irrigation and surface water management. Two four-level towers include commercial, live/work and flexible units on the ground floor, and the courtyard between the towers connects to an existing public park. City parking on site is decoupled from the unit cost to reduce on-site parking zoning requirements and reduce rents for households without cars.

Other Considerations

Displacement

The opportunity to promote infill and transit oriented development (TOD) can place significant displacement pressures on existing lower income residents; potentially exacerbating the challenge to address important planning objectives such as climate change. As population continues to grow in California, the pressure on housing grows as well. In these circumstances, programs and policies to address displacement issues may be appropriate, such as policies and programs to prioritize the preservation and creation of housing affordable to lower-income households in TOD and infill areas. Additionally, ensuring that various types of housing supply for multiple income levels continue to be built, while protecting existing residents from market forces has many challenges. HCD has compiled a set of best practices to prevent displacement. California's Statewide Housing Assessment examines the need for diverse housing options in the state, and presents both research and options for local governments. Partnerships and collaborations between private developers, public agencies, community groups, and other stakeholders have utilized creative tools to meet housing needs, such as reduced parking requirements, zoning and building codes that support smaller building footprint and design, set back reductions, height increases and density bonuses.

Climate Change

Location and types of housing affect resource conservation in numerous ways, so are worth considering in conjunction with climate change and resource impacts. Infill development can reduce demand on natural resources, and inclusion of additional conservation strategies can reduce the burden even further. Reducing water and energy use can benefit from policies incentivizing conservation, reuse, and recycling in housing developments.

Development patterns influence greenhouse gas (GHG) emissions. Siting housing near services, transportation options, and jobs increases the effectiveness of a multi-modal transportation system. Further, when affordable housing is not available near jobs, people may have to commute long distances, generating high rates of vehicle miles traveled (VMT) and GHG emissions.

Denser forms of development can increase the effectiveness of these relationships, while reducing travel time, travel costs, and the GHG emissions responsible for elevating the risks of climate change. Smaller footprint and parking requirements, mixed uses, innovative ownership strategies and higher densities typical of affordable housing development, are strategies that can contribute to more efficient development patterns.

Transit accessibility is important for housing, jobs, and the environment. Transit hubs record highest levels of ridership within a quarter to half-mile radius. Studies reveal that public transit ridership drops off dramatically after a distance of four miles from transit stations, particularly for those commuting to and from places of employment, as ridership generally depends on variables including quality, frequency of stops and travel time. Lower income households account for nearly one third of all transit riders, and three quarters rely solely on public transportation. Preserving and increasing housing choice for communities that utilize public transit most will continue to contribute to the reduction of carbon emissions.

The housing element is a critical tool in implementing policies and programs that lower GHG emissions and promoting sustainable development. SB 375. Through the housing element's site's inventory, jurisdictions must plan for where housing development will occur and adopt policies and programs to facilitate the development of housing. The jurisdiction can identify sites and adopt programs that direct growth in areas that promote efficient development patterns and transit use and alternative modes of transportation such as biking or walking. Programs to incentivize development such as mixed-use, affordable housing, and transit oriented development could include flexible development standards, fee reductions, expedited processing, and offer by-right permitting of projects that meet sustainability objectives. In addition, the housing element focuses on opportunities for rehabilitation and preservation of existing housing. This provides an important tool to target housing rehabilitation dollars to preserve older housing stock and achieve various objectives such as energy efficiency, health and transit options.

Finally, the impacts of climate change on housing affordability, insurability and viability should be considered.

Utilizing guidance included in the safety element, climate change chapter and the Integrated Climate Adaptation and Resiliency Program (ICARP) can help guide the process of addressing climate change.

Health

Housing affordability significantly impacts health. Affordable housing can provide increased stability, which allows families more resources for other goods and services, health care needs, and basic necessities such as healthy food. Housing location also affects access to parks, recreation, and grocery stores with healthy food, jobs, schools, and other community necessities. Positive health benefits, including decreasing stress-related illnesses associated with long drive times and increased physical activity result from locating housing thoughtfully. Housing opportunities for all income levels should be incorporated throughout cities and counties, rather than concentrated in existing low income neighborhoods. Distribution of affordable housing opportunities, through land use and zoning decisions as well as other tools, can ensure a jurisdiction's commitment to affirmatively furthering fair housing, maintaining equity, and improving health outcomes.

Neighborhoods designed to facilitate active transportation - walking, and biking - facilitate weight control and other health benefits. Walkability is influenced by neighborhood design and accessibility to transit, employment, schools, services and recreational opportunities and amenities. "Safe routes to school," for example, is an important benefit for parents and children. New housing development presents a significant opportunity to engage developers in enhancing the surrounding built environment to promote the health and well-being of residents. Construction and reconstruction efforts can coordinate with infrastructure upgrades, new transit and active transportation facilities, and open space facilities as part of the development project. Cities and counties should consider the needs of the existing community and projected new members and collaborate with developers and stakeholders throughout the process when possible.

Multifamily housing developments are often used as platforms for integrating healthcare, especially for the elderly. A number of housing developments in major metropolitan areas include health clinics and community spaces, and tenant services for special needs populations such as elderly and disabled. Supportive services have multiple benefits, for both tenants and property management. Integrated service delivery plays a critical role with populations at risk of homelessness or institutionalization.

The quality of housing available impacts the health of residents and community members. Factors such as indoor air quality, mold and moisture, pests, safe drinking water availability, lead, and second-hand smoke affect the safety and health of residents' homes. Housing policies can direct housing quality by mitigating or preventing health impacts. For more information on relationships between housing and health, see the air quality and healthy communities chapters. SB 1000 now requires jurisdictions with disadvantaged communities to address promotion of safe and sanitary housing particularly for that population. See EJ section for more details.

Economic Development

Stable housing (adequate, safe and affordable) is a foundation for family economic well-being and thriving communities. Families in stable housing have more income in their budget available for basic living necessities, such as food, utilities, transportation to and from work, school, day care, and healthcare. Planning housing connected to transit, employment centers, services, schools, and destinations reduces living costs and also reduces greenhouse gas emissions.

As a communitywide asset, adequate, stable housing can boost the surrounding economy, through increased local spending, employment, and revenues for local governments. Cost of shelter is the largest, non-negotiable expense for most families. When this cost is excessive, families fall behind on rent or mortgage payments, have little or no disposable income, and often go without food, utilities, or healthcare.

Employers and regional economies are at competitive disadvantages without a sufficient supply of affordable housing. A survey of 300 companies found that one in the three reported that the lack of affordable housing nearby impacts the ability to attract or retain qualified entry- and mid-level workers.

The housing element is a jurisdiction's primary tool to address issues of overcrowding, rehabilitation, and access to affordable housing opportunities. Through the housing element's public participation process, the jurisdiction has an opportunity to identify those housing issues in the community that are of most concern and include policies and programs to address those concerns.

The Location Affordability Index (LAI) gives estimates of the percentage of a family's income dedicated to the combined cost of housing and transportation in a given location. The goal of the LAI is to help individuals, planners, developers, and researchers get a more complete understanding of the costs of living in a given location by accounting for variations between households, neighborhoods, and regions, all of which impact affordability.

Education

Affordable housing is a key ingredient for the educational well-being of families, facilitating educational attainment. Stable and safe housing provides a learning environment. Studies indicate that stable home environments are critical to educational outcomes. Areas of socioeconomic distress may have additional needs for educational support.

The housing element can provide the linkage between housing and education through identifying key resources and policies to promote safe, decent, stable and affordable housing and educational attainment. For example, the sites inventory of a housing element can identify housing opportunities near schools, libraries, and educational services, promote policies to increase affordable housing opportunities, and encourage affordable housing developments to include essential educational programs. Coordination between housing and local school districts can help achieve mutual goals and benefits.

Infill

Housing that is affordable to a broad range of households and income groups is constrained in many communities. Infill development can be an attractive option for accommodating growth and providing a mix of housing choices in many communities – particularly as it can result in lower municipal costs for both capital improvements and long-term operations and maintenance as compared to "greenfield" development. Infill development provides an opportunity to revitalize economically-underutilized land, and also conserves resources and provides environmental and health benefits. Infill development also has the potential to reduce GHG emissions to the extent that it spurs more pedestrian activity, increases transit usage, and reduces the number and lengths of trips. Infrastructure and utilities must be able to support the infill envisioned through the general plan so it is important to coordinate planned infill priority areas with Capital Improvement Plans and other infrastructure investment planning.

The sites inventory requirement of the housing element is one opportunity for identifying opportunities for infill development.

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate A full list of recommended policies can be found here.

Sample Policy	Example of Application	Relationship to Other Elements
[City, county] shall encourage development of residential uses in strategic proximity to employment, recreational facilities, schools, neighborhood commercial areas, and transportation routes.	Long Beach	Circulation, land use, healthy communities, economic development, climate change
[City, county] shall revise County ordinances and fees to encourage development of secondary dwellings, and further promote secondary dwellings. For example, the County will consider revising road requirements and public facility fees for secondary dwellings or according to home size.	San Luis Obispo County	Equitable and resilient communities, economic development, healthy communities, circulation
[City, county] shall integrate and disperse special needs housing within the community and in close proximity to transit and public services.	Long Beach	Land use, circulation, equitable and resilient communities, economic development
[City, county] shall invest in infrastructure and public facilities to ensure that adequate water, sewer, roads, parks, and other needed services are in place to serve existing and future residential developments.	Kings County	Air quality, healthy communities, equitable and resilient communities, economic development, climate change
The [city, county] shall encourage the development of senior housing and assisted living facilities, especially near transit, recreational facilities, medical centers and hospitals, neighborhoods well served by pedestrian facilities, and access to healthy food.	City of Chino	Healthy communities, economic development, equitable and resilient communities

4

Conservation Element

Introduction

The conservation element describes the jurisdiction's natural resources: land, water, ecosystem services and living resources, and the benefits that these resources provide to the community. The conservation element establishes goals and policies for their retention, enhancement and development. The open space element and the land use element should work in coordination with the conservation element to guide conservation and development, balancing community needs with environmental preservation and the effects of climate change. All three of these mandatory elements must be consistent with the others.

Conservation of environmental and agricultural resources is one of the State's three planning priorities, and helps to achieve the State's climate goals. Land conservation policies may have many benefits. Agricultural land conservation can be a foundation for more permanently preserving lands at the edge of cities for their intrinsic open space values. As agricultural activities produce self-sustaining revenue, agricultural conservation can be amongst the most cost-effective means of protecting open space and promoting infill development. By maintaining a buffer zone between urban developments, agricultural lands can reduce sprawl and help to preserve the unique cultural character of separate communities. Prime agricultural lands also help to conserve key environmental values, including quality soil, air, and water. Finally, agricultural lands can provide a critical role in planning strategies to maintain connectivity of conserved lands, successfully preserving wildlife corridors and wetlands.

This section describes the required components of the conservation element, and provides links to suggested policies and tools to help communities in their updates and help to achieve the State's goals.

CORRELATIONS AMONG ELEMENTS

	Land Use	Circulation	Housing	Open Space	Noise	Safety	EJ
Conservation	IN STATUTE	RELATED	RELATED	IN STATUTE	-	IN STATUTE	-

■ Identified in statute ■ Closely related to statutory requirements

Government Code section 65302(d):

(d) (1) A conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. The conservation element shall consider the effect of development within the jurisdiction, as described in the land use element, on natural resources located on public lands, including military installations. That portion of the conservation element including waters shall be developed in coordination with any countywide water agency and with all district and city agencies, including flood management, water conservation, or groundwater agencies that have developed, served, controlled, managed, or conserved water of any type for any purpose in the county or city for which the plan is prepared. Coordination shall include the discussion and

evaluation of any water supply and demand information described in Section 65352.5, if that information has been submitted by the water agency to the city or county.

(2) The conservation element may also cover all of the following:

(A) The reclamation of land and waters.

(B) Prevention and control of the pollution of streams and other waters.

(C) Regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan.

(D) Prevention, control, and correction of the erosion of soils, beaches, and shores.

(E) Protection of watersheds.

(F) The location, quantity and quality of the rock, sand, and gravel resources.

(3) Upon the next revision of the housing element on or after January 1, 2009, the conservation element shall identify rivers, creeks, streams, flood corridors, riparian habitats, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management.

Completeness Checklist

Local agency staff can use the following checklist to help ensure that the draft conservation element addresses all required issues. Please note that use of this checklist is purely advisory, and only contains issues that are legally required and the optional issues listed in Government Code section 65302(d)(2). Conservation elements may address additional issues at the discretion of the local government. Because general plan formats may vary, this checklist suggests identifying where the particular government code provision is satisfied.

Statutory Citation	Brief Description of Requirement
Gov. Code, §§ 65302(d)(1), 65352.5	Water and its hydraulic force
Gov. Code, § 65302(d)(3)	Floodwater Accommodation
Gov. Code, § 65302(d)(1)	Forests
Gov. Code, § 65302(d)(1)	Soils
Gov. Code, § 65302(d)(1)	Rivers and other waters
Gov. Code, § 65302(d)(1)	Harbors
Gov. Code, § 65302(d)(1)	Fisheries

Statutory Citation	Brief Description of Requirement
Gov. Code, § 65302(d)(1)	Wildlife
Gov. Code, § 65302(d)(1)	Minerals
Gov. Code, § 65302(d)(1)	Other natural resources
Gov. Code, § 65302(d)(2)	Reclamation of land and waters (optional)
Gov. Code, § 65302(d)(2)	Pollution of streams and other waters (optional)
Gov. Code, § 65302(d)(2)	Land use in stream channels and other areas (optional)
Gov. Code, § 65302(d)(2)	Erosion (optional)
Gov. Code, § 65302(d)(2)	Protection of watersheds (optional)
Gov. Code, § 65302(d)(2)	Rock, sand, and gravel resources (optional)

Required Contents

The conservation element must address the "conservation, development, and utilization of natural resources including

- Water and its hydraulic force
- Forests
- Soils
- Rivers and other waters
- Harbors and fisheries
- Wildlife
- Minerals, and other natural resources

The Government Code further requires the conservation element to "consider the effect of development within the jurisdiction, as described in the land use element, on natural resources located on public lands, including military installations" (Gov. Code § 65302(d)(1)). Evaluation of a jurisdiction's natural resource systems based on sound science and ecological principles is an important first step in preparing the conservation element. One role of the conservation element is to establish policies that reconcile conflicting demands on those resources. In recent years, some jurisdictions have adopted policies related to mitigation banking, conservation easement programs, and the state and federal Endangered Species acts in their conservation elements. Other local jurisdictions have incorporated policies related to regional greenprints or Natural Community Conservation Planning (NCCP) programs. Both of these methods present a broad-based approach to the regional protection of plants and animals and their habitats while allowing for compatible and appropriate economic activity. The California Department of Fish and Wildlife, Department of Conservation, Natural Resources Agency, and Department of Water Resources are some of the many resources available for examining current and future conservation needs. In addition, resource data is available for jurisdictions through the General Plan Mapping tool. Jurisdictions should assess the current condition of their natural resource systems, the ecological processes and compatibilities upon which they depend and their sustainability based on anticipated uses. Analysis of the sustainability of resource uses should take into account changing burdens

on local ecosystems as a result of a changing climate or other environmental conditions, and should measure the values that these resources contribute to the community and state (see above sidebar on nature's services). In their evaluation of natural resources, local governments should identify priority areas to conserve that offer the most effective and efficient protection of the natural resource systems, and focus policies on those resources or areas. Greenprints, or sustainability plans seeking to balance conservation with growth, are one example of incorporating "green infrastructure" into general plans (see more in text box).

Local governments can dramatically impact the type and amount of water used and conserved within their jurisdictions through land use decisions. For example, requiring more compact development types can significantly reduce per capita water use. Limiting new impervious cover in key recharge areas can protect groundwater supplies. Low impact development strategies such as green roofs, bioretention, and soil amendments, can redirect storm water from sewer lines to recharge areas, and thereby enhance water supplies. The California Water Plan provides strategies, resources, and tools for water management and conservation throughout the State.

The following sections include descriptions of each of the requirements with links to model policies and useful information. Some of the requirements will not be locally relevant for all communities. For example, a land-locked county with no river ports would likely not need to address harbors in its conservation element. It is up to the jurisdiction to choose how to arrange their treatment of the various required issues, which may overlap with one another when addressed in the conservation element's goals and policies.

Planning with conservation in mind can create thriving spaces in the community

Image by Urban Advantage, Community Design + Architecture

Water and Its Hydraulic Force

Requirement Description:

The discussion of water in the conservation element must be prepared in coordination with "any countywide water agency and with all district and city agencies, including flood management, water conservation, or groundwater agencies that have developed, served, controlled, managed, or conserved water of any type for any purpose in the county or city for which the plan is prepared," and must include any information on water supply and demand (Gov. Code § 65302(d)(1)).

Specific information must be shared with groundwater agencies. The Sustainable Groundwater Management Act (SGMA) allows local jurisdictions to customize groundwater plans based on their specific needs. Discussion of water should analyze water needs for domestic, agricultural, ecological and industrial uses, and provide for the conservation of water supplies and protection of aquatic ecosystems as a beneficial use. Land use choices affect water demand long into the future. When evaluating the feasibility of possible land use patterns, cities and counties should work with water agencies to consider projected available water resources under a changing climate, and water conservation measures to ensure a sustainable water supply, rather than simply deferring to water

Natural Resources as Nature's Benefits; Greenprints and Conservation

A conservation element can include a quantification and explanation of the benefits that the community obtains from their surrounding ecosystems. Communities' well-being depends on the benefits that nature provides for free, every day and everywhere. For example, we depend on ecosystems such as forests and wetlands, for clean water, fertile soils, food, fuel, storm protection, minerals and flood control.

These benefits, often called "nature's benefits," are commonly categorized into four broad categories. Provisioning benefits include the production of food and water, while regulating benefits include the control of climate and disease. Supporting benefits include nutrient cycles and crop pollination. Lastly, cultural benefits include spiritual and recreational opportunities. To help inform planning decisions, these benefits can be assigned economic values, values that measure other non-monetary benefits to the community, and values that demonstrate the benefits gained when various natural resources mutually reinforce each other. These benefits and services can be expressed in a "Greenprint," such as those developed under the federal sustainable communities initiative, which can help local governments to analyze and plan for these cross-cutting and community-supporting benefits in their general plan updates and apply innovative and successful strategies for implementation. For more information on ecosystem services see

http://www.fs.fed.us/ecosystemservices/

http://www.nature.org/science-in-action/ecosystem-services.xml

agencies to meet any projected demand. Jurisdictions may want to form joint committees to synchronize planning timelines between water and land use, coordinate with local integrated regional water management plans (IRWM), consider using watersheds as their planning area, or explicitly acknowledge their relationship to an existing watershed. Smaller urban development footprints (i.e. concentrated development) protect and enhance the watershed, improving water supply, flood management, and water quality. The California Water Plan currently projects diminishing reliability in water supplies of 3-5% in the next twenty years. Existing water sources may also become less reliable due to climate change and development. The conservation element is inextricably connected to the land use and open space elements.

The decision in *County of Amador v. El Dorado County Water Agency* helps to further clarify the relationship between availability of water and development: "in determining whether and where to permit development, a county must necessarily

consider the availability of consumptive water supplies. If additional water supplies are available, growth and development are feasible. Conversely, if that water is not available, growth is necessarily limited." The Government Code and Water Code additionally require water supply districts to prepare water supply verifications and assessments for some large-scale projects, including subdivisions of over 500 dwelling units (Gov. Code § 66473.7)). When amending its general plan, a jurisdiction shall coordinate with any public water agency pursuant to Government Code section 65352.5 to analyze available water supply information and identify adequate water for anticipated growth. Additionally, Urban Water Management Plans, where required, rely on build-out data from general plans, highlighting the importance of consistency and communication between agencies. For specific projects, the water supply verification comes at the final approval stage of project development, and a subdivision cannot be approved if adequate water supplies do not exist at this stage. (Gov. Code § 66473.7(b)(1)).

National Flood Insurance Rate Program maps, dam failure inundation maps, information available from the California Department of Water Resources, U.S. Army Corps of Engineers, the Federal Emergency Management Agency and historical data on flooding all provide useful information for identifying flood-prone areas for floodwater management purposes. Aspects of floodwater management must also be addressed in the land use and safety elements, and local governments may want to consider combining these discussions in their general plans (Gov. Code §§ 65302(a), 65302(g)(2)). The Government Code also provides further requirements on development in flood hazard zones as defined in Government Code section 65007(d) in the Sacramento-San Joaquin Valley (Gov. Code §§ 65302.9, 65860.1, 65865.5, 65962, 66474.5).

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Assessment of existing and projected demands on water supply sources	Inventory of quality and boundaries of watershed, aquifer recharge areas, groundwater basins, and other water resources
Risk assessment for flooding	Flood maps
Examination of ability to align policies, zoning, and goals regarding housing built	Number of housing units allocated through SCS
Assessment of potential housing developments	Documented interest by developers and landowners

Forests

Requirement Description:

The conservation element must provide for the management, enhancement, protection, and potential modification of the current agroforestry practices for wildlife protection, watershed protection, recreation, and aesthetic purposes. Possible topics to address include protection of oak woodlands and urban forests, analysis of possible future development within resource areas, the need for suitable and predicted-to-be suitable habitat management for the mitigation of climate change, precipitation retention for watershed management and attenuation of flood waters, aesthetics, cultural use, commercial value of forests, and protection of timber resources subject to timberland production zoning (Gov. Code § 51104(e-g); 51110-51119.5)

California's forests are valuable assets and their conservation provides many benefits to the natural and built environments. As trees grow and develop, their value to the forest ecosystem and climate change mitigation increases. Older trees sequester significantly more carbon than young trees and are necessary for nutrient cycles for nitrogen and phosphorous. These nutrients are limited,

and without proper maintenance, could eventually deplete the soil. Trees and source wood left on site significantly contribute to the abundance of biodiversity and the prevention of habitat loss and displacement. Trees in forest and urban areas act as micro and macro climate buffers by moderating temperatures and moisture.

Conservation of forests should be balanced with the proper action to prevent risk from wildfires (see the safety element for more information). As climate change persists and temperatures rise, wildfires will continue to grow in size, frequency, and total area burned. Throughout its history, California experienced frequent fires by lightning and burning regimes, critical in developing the composition, structure, and pattern of vegetation throughout the state's landscapes.

In order to prevent destructive wildfires and restore and maintain resilient landscapes, policies should be developed that are appropriate for local conditions to mitigate potential losses due to wildfire. Policies for mitigating potential losses should also consider approaches to maintain healthy forests, including prescribed burns, fuel breaks, wildfire protection zones, and forest thinning and grazing. Fuel treatment manipulates and removes fuel to reduce fire intensity with methods such as lopping, chipping, crushing, piling, and burning. Fuel treatment is critical to enhance protection of forests as well as develop resilience. As a guiding resource, OPR's Fire Hazard Planning Technical Advisory includes a detailed discussion about how to incorporate and comply with the fire hazard requirements in a general plan.

Forest conservation practices also present the opportunity to conserve species in their native habitat. Collaboration with local tribes, resource conservation districts, non-government conservation organizations, and other government entities may help determine the best tools for ecosystem restoration, wildfire prevention, and wildlife habitat enhancement.

The management and protection of forests should take into account anticipated changes in coming decades in temperature, the viability or presence of particular wildlife populations in response to warming trends, and the impact on forestry resources of increased extreme weather events and more intense forest fire seasons. For reference, visit http://www.fs.fed.us/maps/.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Analysis of conservation needs	Type, location, amount, and ownership of forests by category
Reduce risk of wildfire and post-fire mitigation needs	Fire hazard zone maps

Soils

Requirement Description:

Soils provide the fundamental resources necessary for the production of food, fiber and other agricultural products. Healthy soil resources, rich in soil organic matter, are essential to crop production, watershed functioning, carbon sequestration, and the support of vegetation. Highly productive soil resources that support agricultural production and ecosystem services are a finite resource; thus requiring long-term conservation. Soil management and conservation practices, such as cover cropping, crop rotation, mulching, and nutrient management, may help support healthy soils and conservation goals.

The Official Soil Series Descriptions (OSDs) and the Storie Index provide useful tools for assessing and inventorying farmland soils, as does the Farmland Mapping & Monitoring Program of the state Department of Conservation. Consultation with the city or county's local Resource Conservation District may also be helpful in assessing soil resources and developing policies focused on the management of agricultural soils; consistent with the Resource Conservation District's broader agricultural strategy. The conservation element should identify soils necessary for agricultural production and include policies that promote the conservation of these resources. Preservation of prime agricultural land, and identification of water availability for that land, can be a foundation for improving and maintaining soil while more permanently preserving lands, improving the economy, and preserving biological resources, and should be coordinated with the land use element. Local governments should identify areas included in agricultural preserves under the Williamson Act (Gov. Code § 51200). Additionally, conservation easements on agricultural lands, working with willing landowners and land trusts, can also serve to protect soil resources and constitute feasible mitigation to lessen impacts on agricultural resources, including highly productive soils. The soils section may also identify areas subject to slides and erosion and include policies focusing on erosion prevention, one of the optional issues listed in Government Code section 65302(d)(2).

Daylighting Existing Waters

Cities and counties across California and the country are recognizing the potential benefits of revitalizing rivers, streams, and creeks long hidden by previous development. Waterways have historically been covered, especially in urban areas, to quickly redirect stormwater, create more room for commercial districts, and enable automobile transport. In the past decade, however, planners have begun to note the possible advantages of daylighting and restoring waterways, including:

- Reducing flooding
- Conserving groundwater
- Reducing heat island effects
- Providing greenspace for the community
- Activating urban spaces

Examples of programs to restore urban waterways include the LA River in Los Angeles, Strawberry Creek in Berkeley, and San Luis Obispo Creek in San Luis Obispo.

Rivers and Other Waters

Requirement Description:

The rivers and other waters requirement examines water quality in local bodies of water. As with water and its hydraulic force, any discussion of water in the conservation element must be prepared in coordination with "any countywide water agency and with all district and city agencies, including flood management, water conservation, or groundwater agencies that have developed, served,

controlled, managed, or conserved water of any type for any purpose in the county or city for which the plan is prepared," and must include any information on water supply and demand prepared pursuant to Government Code section 65352.5 (Gov. Code § 65302(d)(1)). Topics to address include identification of existing and potential water pollution sources, the benefits that water resources provide to the community, opportunities for protection and restoration, and identification of water sources for which reclamation is feasible. Policies should take into account the impacts of future development on water bodies and aim to protect or improve water quality. Preservation of flood plains and innovative methods of flood control, such as making "room for the river," can have positive benefits for related elements of the plan. Certain areas may also be important for groundwater recharge.

Rivers, lakes, streams, bays, harbors, estuaries, marshes, and reservoirs might be affected by climate change impacts such as decreased snow pack, changes in precipitation, and sea level rise. Cities and counties should consider taking these projected impacts into account when planning for the protection of their water bodies.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Compliance with total maximum daily load (TMDL) regulations	Current loads, expected project impact

Harbors and Fisheries

Requirement Description:

The harbors and fisheries requirement addresses the development and improvement of port, harbor, and waterway facilities. This issue has significant overlap with the circulation element, and may be combined with it at the local government's discretion. Policies in general plans should be consistent with harbor and port master plans developed under the California Coastal Act (Pub. Resources Code § 30000 et seq.).

Fisheries are an important component of California's economy, and their careful management ensures their viability into the future. Possible topics to address in the fisheries section include evaluation of existing and projected future water quality; temperature; sources of contaminants in bodies of water used for subsistence, recreational, and commercial fishing; expected impacts of climate change on habitat and fisheries and policies that protect and rehabilitate those water bodies; existence and purpose of marine protected areas (MPAs); and preservation of riparian, tidal, and wetland habitat connected to waterways.

Wildlife

Requirement Description:

California is home to a diverse array of wildlife, and the conservation element should provide plans for the protection and preservation of these populations and their habitats. This must include wildlife that is classified as a rare, threatened, or endangered species under state and federal law (Fish & G. Code § 2050 et seq.; 16 U.S.C. § 1531). Planning for wildlife habitats should account for current habitats, health of wildlife, projected changes in such habitat due to climate change, wildlife conservation, furthering responsible development and addressing the needs of a growing human population, habitat connectivity and potential threats to such habitat from development

pressures, fragmentation and edge effects. The conservation element's focus on wildlife should be consistent with the State Wildlife Action Plan, California Essential Habitat Connectivity Project, Regional Advance Mitigation Plans, conservation plans developed by the state and regional entities, Habitat Conservation Plans (e.g. California Endangered Species Act (CESA), California Environmental Quality Act Review (CEQA), Lake and Streambed Alteration Program (LSA), Timberland Conservation Program, Natural Community Conservation Planning (NCCP), Conservation and Mitigation Banking, Invasive Species Program, Native Plant Program) and other management plans, and should include coordination with other government agencies involved in wildlife preservation. Due to the considerable overlap between habitat lands and agricultural lands, multiple benefits for wildlife and agriculture may be gained by coordinating conservation plans and strategies. The California Agriculture Vision Document highlights relationships between habitat and agricultural conservation, and presents strategies for the conservation of both.

The Marine Life Protection Act of 1999 (MLPA) recognized the need to safeguard the long-term health of California's marine life. By establishing a statewide network of marine protected areas (MPAs) designed, created, and managed using sound science and stakeholder input, MLPA aimed to protect the diversity and abundance of marine life, the habitats they depend on, and the integrity of marine ecosystems in California. MPAs are named, discrete geographic marine or estuarine areas designed to protect or conserve marine life and habitat. Potential interactions between MPAs and planned land uses may affect wildlife, harbors and fisheries, and other considerations related to conservation and open space in some communities. Cities and counties should consult the interactive MarineBIOS map available from the Department of Fish and Wildlife, or the General Plan Mapping Tool to examine MPAs around their communities.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Identify specific tools and approaches to restore natural areas to benefit fish and wildlife as part of a sustainable flood management plan	DWR Conservation Strategy
Project impacts on critical habitat for listed species	Map of critical habitats
Analysis of existing conservation projects	SGC Review of Conservation lands

Minerals and Other Natural Resources

Requirement Description:

According to California Public Resources Code section 2005, minerals "means any naturally occurring chemical element or compound, or groups of elements and compounds, formed from inorganic processes and organic substances, including, but not limited to, coal, peat, and bituminous rock, but excluding geothermal resources, natural gas, and petroleum." While not explicitly required, local governments may also want to consider geothermal, petroleum, and natural gas in their assessment of mineral resources as appropriate. The minerals section should locate and inventory mineral resources designated by the State Mining and Geology Board under the Surface Mining and Reclamation Act (Pub. Resources Code § 2710 et seq.), and include polices that plan for the protection, use, and development of mineral resources. This section should also locate and plan for the protection, use and development of rock, sand and gravel resources, one of the optional issues listed in Government Code section 65302(d)(2) if those resources are found in the jurisdiction.

'Other natural resources' may include agricultural resources, wetlands, urban forestry, air, and energy producing resources. Some cities and counties also include paleontological and archaeological resources in this section. Model policies include those that assess air quality and coordinate with other agencies and jurisdictions to improve it; identify agricultural resources using the Natural Resources Conservation Service's land inventory and monitoring criteria inventory; include plans for the preservation of wetlands; and inventory energy resources including wind, solar, hydroelectric, and biomass resources. Air quality policies should be consistent with regional air quality and transportation plans.

Floodwater Management

Requirement Description:

To address floodwater management in the conservation element, the city or county should collect information concerning its flood plains and its watershed. DWR has updated its Best Available Maps to display the latest floodplains. DWR has expanded the floodplains to cover all counties in the State and to include 100, 200, and 500-year floodplains. The Office of Emergency Services (OES) and DWR have information on past floods and flood levels. Local levee districts and resource conservation may also have information to share.

DWR also completed the 2012 Central Valley Flood Protection Plan (CVFPP), which provides a guide for state participation with managing flood risk along the Sacramento River and San Joaquin River. The CVFPP provides data and analysis that include the locations of flood hazard zones; goals, policies, and objectives based on that data and analysis; and feasible implementation measures designed to carry out these goals, policies, and objectives. The CVFPP includes a Groundwater Recharge Opportunity Analysis, which can also be useful. This document summarizes an evaluation of groundwater recharge project types and general locations that could be used to integrate groundwater recharge and groundwater storage with the flood management system to increase both flood management flexibility and water supply reliability.

DWR also recommends working with applicable agencies to incorporate improvements in flood control channels that provide opportunities for stormwater retention and groundwater recharge, when major upgrades and/or reconstruction are required. Low impact development strategies may also help protect communities from floodwater by redirecting stormwater.

For additional data and analysis related to flood safety, see the safety element. For data and analysis related to identification and annual review of areas subject to flooding, see the land use element.

Optional Issues

Pursuant to Government Code section 65302(d)(2), the conservation element may also cover the reclamation of land and waters; prevention and control of the pollution of streams and other waters; regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan; prevention, control, and correction of the erosion of soils, beaches, and shores; protection of watersheds; protection of habitat connectivity, and the location, quantity, and quality of rock, sand, and gravel resources. Local governments might choose to integrate these optional issues into their analyses of and policies for the mandatory requirements.

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate. A full list of recommended policies can be found here:

Sample Policy	Example of Application	Relationship to Other Elements
[City, county] shall identify and develop a coordinated biological preserve system that includes Pre–Approved Mitigation Areas, Biological Resource Core Areas, wildlife corridors, and linkages to allow wildlife to travel throughout their habitat ranges. Avoid adverse impacts to wildlife movement corridors and nursery sites (e.g., nest sites, dens, spawning areas, breeding ponds).	San Diego County, Yolo County	Land use, open space, climate change
[City, county] shall allow for appropriate public access to open space lands for recreation activities while protecting and restoring the natural ecosystem and minimizing environmental damage, as appropriate	Redwood City	Land use, open space, circulation, equitable and resilient communities, economic development
[City, county] shall in conjunction with new development located along existing creeks and streams and where appropriate, incorporate daylighting for culverted portions or other bank naturalizing approaches for channeled sections as a means of creek and stream restoration.	Redwood City	Land use, open space
[City, county] shall establish a coherent and logical pattern of urban uses that protect and enhance open space and agricultural uses by providing a clear and permanent boundary for urban uses with the [city, county]'s planning area.	City of Livermore	Land use, circulation, housing, conservation, safety, climate change, economic development

4

Open Space Element

Introduction

"California legislative policy strongly favors the preservation of open spaces" (*Gisler v. County of Madera* (1974) 38 Cal. App. 3d 303, 307; see also Cal. Const. art. XIII, § 8). Together with the conservation element, an open space element identifies areas that provide value in an essentially undeveloped condition and creates a plan to preserve such areas. The open space element reinforces the conservation element by guiding the comprehensive and long-range preservation of open space lands that are important to the conservation of the State's natural resources. The conservation element should be used to inform and support both the open space element and the land use element, guiding the identification of resource areas that should remain undeveloped and those that are appropriate for future development. Open space is defined as any parcel or area of land or water that is essentially unimproved and devoted to open-space use (Gov. Code § 65560(b)). Such lands or waters may provide value related to, among other things, recreation, health, habitat, biodiversity, wildlife conservation aesthetics, economy, climate change mitigation and adaptation, flood risk reduction, managed natural resources production, agricultural production, and protection from hazardous conditions.

Because open space issues are broad in nature and overlap those of several elements, consistency among elements must be considered carefully. The open space element is interrelated with other elements, overlapping with the conservation element when referring to open space dedicated to the preservation of natural resources and the managed production of resources; the safety element when considering open space for public health and safety; and the housing and land use elements when determining the suitability of sites for future development.

CORRELATIONS AMONG ELEMENTS

	Land Use	Circulation	Housing	Conservation	Noise	Safety	EJ
Open Space	RELATED	RELATED	RELATED	IN STATUTE	RELATED	IN STATUTE	RELATED

■ Identified in statute ■ Closely related to statutory requirements

Government Code Section 65560

(a) "Local open-space plan" is the open-space element of a county or city general plan adopted by the board or council, either as the local open-space plan or as the interim local open-space plan adopted pursuant to Section 65563.

(b) "Open-space land" is any parcel or area of land or water that is essentially unimproved and devoted to an open-space use as defined in this section, and that is designated on a local, regional, or state open-space plan as any of the following:

(1) Open space for the preservation of natural resources, including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays, and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and watershed lands.

(2) Open space used for the managed production of resources, including, but not limited to, forest lands, rangeland, agricultural lands, and areas of economic importance for the production of food or fiber; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers, and streams that are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.

(3) Open space for outdoor recreation, including, but not limited to, areas of outstanding scenic, historic, and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas that serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.

(4) Open space for public health and safety, including, but not limited to, areas that require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, flood plains, watersheds; areas presenting high fire risks; areas required for the protection of water quality and water reservoirs; and areas required for the protection and enhancement of air quality.

(5) Open space in support of the mission of military installations that comprise areas adjacent to military installations, military training routes, and underlying restricted airspace that can provide additional buffer zones to military activities and complement the resource values of the military lands.

(6) Open space for the protection of places, features, and objects described in Sections 5097.9 and 5097.993 of the Public Resources Code.

Completeness Checklist

Local agency staff can use the following checklist to help ensure that the open space element addresses all required issues. Please note that use of this checklist is purely advisory, and only contains issues that are legally required by Government Code section 65560 et seq. Open Space elements may address additional issues at the discretion of the local government. Because general plan formats may vary, this checklist suggests identifying where the particular government code provision is satisfied

Statutory Citation	Brief Description of Requirement
Gov. Code § 65563	Long range and comprehensive
Gov. Code § 65563	Plan for preservation and conservation of open space lands, including the following:

Statutory Citation	Brief Description of Requirement
Gov. Code § 65560(b)(1)	Open Space for Natural Resources • Areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; • Areas required for ecologic and other scientific study purposes; • Rivers, streams, bays and estuaries; and • Coastal beaches, lakeshores, banks of rivers and streams, and watershed lands
Gov. Code § 65560(b)(2)	Open Space for Managed Production of Resources • Forest lands, rangeland, agricultural lands (reflecting Department of Conservation agricultural resources maps and inventory) and areas of economic importance for the production of food or fiber; • Areas required for recharge of groundwater basins; • Bays, estuaries, marshes, rivers and streams which are important for the management of commercial fisheries; and • Areas containing major mineral deposits, including those in short supply
Gov. Code § 65560(b)(3)	Open Space for Outdoor Recreation • Areas of outstanding scenic, historic and cultural value; • Areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and • Areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors
Gov. Code § 65560(b)(4)	Open Space for Public Health and Safety • Areas which require special management or regulation because of hazardous or special conditions such as o Earthquake fault zones, o Unstable soil areas, o Flood plains, o Watersheds, o Areas presenting high fire risks, o Areas required for the protection of water quality and water reservoirs and o Areas required for the protection and enhancement of air quality
Gov. Code § 65560(b)(5)	Open Space for Military Support • Areas adjacent to military installations, • Military training routes, and • Areas underlying restricted airspace
Gov. Code § 65560(b)(6)	Open Space for Tribal Resources • Public land containing any Native American o Sanctified cemetery, o Place of worship, o Religious or ceremonial site, or o Sacred shrine • Native American historic, cultural, or sacred sites, that are listed or may be eligible for listing in the California Register of Historic Resources pursuant to Section 5024.1 • Tribal consultation is required to determine the level of confidentiality needed (§ 65562.5)
Save El Toro Assn. v. Days (1977) 74 Cal. App. 3d 64, 73 Gov. Code § 65560(b)	Inventory of the above lands • Include any parcel that is essentially unimproved (i.e., need not be completely vacant)
Gov. Code § 65562(a)	Policies provide that open space "must be conserved wherever possible"
Gov. Code § 65562(b)	Co-ordinated with state and regional plans
Gov. Code § 65564 • § 65566 • § 65567 • § 65910	Action plan • Acquisition and disposal of open space must be consistent with the open space plan • Building permits, subdivision maps and zoning must be consistent with the plan • Open-space zoning pursuant to § 65910 (e.g., exclusive agriculture zones, large-lot zones, overlay zones for hazards areas, etc.) must be consistent with the plan

4

Required Contents

The Government Code § 65560 requires an open space element to contain detailed information about several categories of undeveloped land. Specifically, the open space element must inventory the following broad categories of open space:

- Open space for natural resources
- Open space for managed production of resources
- Open space for outdoor recreation
- Open space for public health and safety
- Open space for military support
- Open space for tribal resources

The inventory should be reflected on maps, and policies must provide for conservation of such areas wherever possible (Gov. Code § 65562(a)). The General Plan Mapping Tool is a useful tool to help communities identify existing resources, including natural resources, roads, buildings, and demographics, and develop open space inventories accordingly. The tool pulls data from multiple state and federal sources, and allows supplemental data layers from local jurisdictions. The tool allows mapping of known resources, assets, and needs of the community. The local open space plan, together with state and regional plans, must form a comprehensive open space plan (Gov. Code § 65562(b)). Every city and county must prepare, and submit to the Secretary of Natural Resources, an open space plan for comprehensive and long-term preservation of open spaces (Gov. Code § 66563). The plan must include an action program with specific programs to implement the plan(Gov. Code § 65564). These specific requirements are described in greater detail below.

Inventory

Requirement Description:

The open space element must contain an inventory of specified categories of open space resources (*Save El Toro Assn. v. Days* (1977) 74 Cal.App.3d 64, 73). The inventory must include any parcel in one of the listed categories that is: (1) "essentially unimproved" and (2) designated on any local, regional or state open-space plan (Gov. Code § 65560(b)(1)). Note that a particular parcel need not be completely vacant to be included in the inventory. Also, categories of open space are defined in very broad terms in the statute. Thus, designations in local, regional and state plans need not actually use the words "open space" in order to be included in the inventory. In general, a plan should err on the side of inclusion.

Examples of regional and state plans that could include open space designations include, among others:

> *Sustainable Communities Strategies and alternative planning strategies adopted by metropolitan planning organizations in regional transportation plans*
>
> *Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs)*
>
> *Regional greenprints*

Regional conservation assessments

Regional park district plans

Agricultural lands designated on Department of Conservation farmland maps

The specific categories of open space that must be included in the inventory are set forth below.

Open space for natural resources

Requirement Description:

The inventory must identify open space for natural resources, including, but not limited to:

Areas required for the preservation of plant and animal life, including habitat for fish and wildlife species. Such areas may include:

- Areas designated in HCPs and NCCPs
- Critical habitat identified pursuant to the Endangered Species Act (ESA)
- Conservation easements
- Marine protected areas (MPAs)
- Areas identified in greenprints and Regional Conservation Assessments (RCAs)
- Parks and trails
- Areas designated by federal, state, regional and local agencies and governments as important habitat
- Existing forest and woodland areas set aside for mitigation
- Areas important for habitat connectivity

Areas required for ecologic and other scientific study purposes. Such areas may include preserves, parks and other land used by universities to study agricultural systems, wildlife habitats, and other natural systems.

Rivers, streams, bays and estuaries; riparian areas; and coastal beaches, lakeshores, banks of rivers

Simple improvements can create better spaces for recreation and activity

Image by Urban Advantage, Canopy

and streams, and watershed lands. Virtually all waters within a jurisdiction should be identified in the open space element. Upland areas connected to such waters should also be identified. Such areas may be identified in basin plans, watershed plans, and other planning documents produced by the State Water Resources Control Board, Regional Water Quality Control Boards, and other regional entities.

SAMPLE OF OPR RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Identification of protected areas to preserve	Marine protected areas (MPAs), critical habitat areas, areas identified in local conservation plans
Potential effects of development on water sources	Watershed maps

Open Space For Managed Production Of Resources

Requirement Description:

The inventory must include lands that are used for the production, enhancement, or maintenance of natural resources.

Forest lands must be maintained in an efficient way to support the continued cultivation of timberland (Gov. Code § 51101, § 51102). With an increasing state population, these forest areas need to be protected against encroaching development to preserve their ecological services as well as economic vitality. Timberland Production Zones are designated for the production of timber or compatible uses and should not be converted for urban services.

Forest and rangelands information is available from the California Department of Forestry and Fire Protection's California Forest and Range Assessment. Information regarding agricultural lands is available from the Department of Conservation's maps and inventory, California Protected Areas Database, CCED - California Conservation Easement Database, National Conservation Easement Database (NCED), and Conservation Easements Registry.

Many local governments also produce their own information regarding locally important lands.

Areas required for recharge of groundwater basins: Information regarding groundwater recharge should be available from urban water management plans and integrated water resource management plans. Cities and counties must also confer with any locally designated groundwater sustainability agency (SGMA).

Bays, estuaries, marshes, rivers and streams that are important for the management of commercial fisheries: Information on fisheries is available from the Department of Fish and Wildlife.

Areas containing major mineral deposits, including those in short supply: Information regarding mineral resources is available from the Department of Conservation.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Identification of areas to protect in order to maintain groundwater management	Groundwater supply agency, DWR, urban water management plans

Open Space For Outdoor Recreation

Requirement Description:

The open space inventory must reflect open space currently used or planned for outdoor recreation. A city or county should consult with any regional park and open space district in identifying such areas. Jurisdictions should inventory existing recreational space, including marine protected areas adjacent to landside parks, and assess present and future demand based on population, demographic, and development trends. Including existing and planned open space for recreation on the land use map can help coordinate future development with anticipated recreational needs.

Access to open space for recreation impacts individual and community health, and should be planned equitably and with accessibility considerations, to ensure underserved communities are included.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Determine level of access to open space facilities	Transit, bike, and pedestrian paths and routes leading to open space centers
Ensure equitable distribution of recreational open space facilities	Demographic information alongside maps of current and planned open space

Open Space for Public Health and Safety

Requirement Description:

Clean air and water, recreational and natural spaces, farms, ranches, and open spaces conducive to active transportation and healthy lifestyles foster health benefits for communities. The inventory should include areas that require special management or regulation because of hazardous or special conditions. These areas are important for protection or enhancement of public health. Hazardous conditions specifically identified in the statute are:

- Earthquake fault zones
- Unstable soil areas
- Flood plains
- Watersheds
- Areas presenting high fire risks
- Areas required for protection of water quality and water reservoirs
- Areas required for protection and enhancement of air quality

(Gov. Code 65560(b)(4)). Information about those areas is available through the State of California Geoportal site. Much of the information and policies related to hazards will also be relevant to the safety element. For additional ideas on data and analysis, see the healthy communities section and safety element.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Risks associated with designated open space areas	Earthquake fault zones, flood plains, and fire risk areas mapped alongside open space
Identification of areas for enhancement or protection of air quality	Air quality levels by area, circulation maps, inventory of trees and greenery

Open Space for Military Support

Requirement Description:

The open space element must identify military installations and training routes. It should include policies for areas adjacent to or related to military activity. For additional information please review the California Advisory Handbook for Community and Military Compatibility Planning.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Identify areas to protect from development for military purposes	Mapping of military installations and training routes

Open Space for Tribal Resources

Requirement Description:

Consultation with the appropriate tribes is essential to both accurately identify those areas needing protection, and to protect the confidentiality and dignity of sensitive resources. Jurisdictions must consult with Native American tribes during an amendment or update to a general plan (Gov. Code § 65352). The Native American Heritage Commission can help identify the appropriate tribes to engage in consultation. The following are categories of tribal resources that should be included in the open space element and the inventory of open space resources (Gov. Code § 65560(b)(6)); also see adjacent box):

- Public land containing any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine. The Native American Heritage Commission can provide access to such information.
- Native American historic, cultural, or sacred sites that are listed or may be eligible for listing in the California Register of Historic Resources pursuant to Public Resources Code Section 5024.1.

Before the adoption or any amendment of a city or county's general plan, the city or county must conduct consultations with California Native American tribes that are on the contact list maintained by the Native American Heritage Commission for the purpose of preserving or mitigating impacts to places, features, and objects described in Public Resources Code Sections 5097.9 and 5097.993 that are located within the city our county's jurisdiction (Gov. Code § 65352.3(a)(1)). From the date on which a city or county pursuant to this subdivision contacts a California Native American tribe, the tribe has 90 days in which to request a consultation, unless a shorter timeframe has been agreed to by that tribe (Gov. Code § 65352.3(a)(2)).

Government Code § 65560(b)(6):

- Public land containing any Native American
  - » sanctified cemetery,
  - » place of worship,
  - » religious or ceremonial site,
  - » sacred shrine,
  - » burial sites,
  - » historic or prehistoric ruins, or
  - » Native American inscriptions or rock art
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historic Resources pursuant to Public Resources Code Section 5024.1
- Tribal consultation is required to determine the level of confidentiality needed (Gov. Code § 65562.5)

Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Government Code Section 65040.2, the city our county shall protect the confidentiality of information concerning the specific identity, location, character, and use of those places, features and objects. (Gov. Code § 65352.3(b)).

In addition, if new areas containing tribal resources are designated as open space after 2005, Government Code Section 65562.5 requires additional consultation. When consulting tribes, refer to Section V of the 2005 Tribal Consultation Guidelines, Supplement to the GPG:

On and after March 1, 2005, if land designated, or proposed to be designated as open space contains a place of cultural significance, and if an affected tribe has requested notice of public hearing under Government Code §65092, then local governments must consult with the tribe. The purpose of this consultation is to determine the level of confidentiality required to protect the specific identity, location, or use of the cultural place, and to develop treatment with appropriate dignity of the cultural place in any corresponding management plan (Gov. Code §65562.5).

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Identification of Tribal resources to be protected	Inventory of locations and descriptions of resources, obtained through Tribal consultation

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate. A full list of recommended policies can be found here

Sample Policy	Example of Application	Relationship to Other Elements
[City/county] shall work with the Park District to seek locations for and the development of neighborhood parks in those neighborhoods which lack park acreage.	City of Citrus Heights	Land use, conservation, healthy communities
[City/county] shall establish an open space acquisition program that identifies acquisition area priorities based on capital costs, operation and maintenance costs, accessibility, needs, resource preservation, ability to complete or enhance the existing open space linkage system and unique environmental features.	City of Riverside	Land use, conservation, economic development, safety
[City/county] shall maximize public benefits in the reclamation of mineral extraction and sanitary landfill areas	City of Rialto	Land use, conservation, safety, climate change
[City/county] shall maintain habitat corridors to connect conservation areas such as parks, [marine protected areas], and open space, protect biodiversity, accommodate wildlife movement and sustain ecosystems	City of Citrus Heights	Land use, conservation, climate change
City/county] shall develop, wherever possible, recreation facilities that have multi-use capabilities and high degree of adaptability to more intensive use or uses as recreation demand changes and/or population density increases	City of Brea	Land use, conservation, equitable and resiliant communities, economic development, healthy communities

4

Noise Element

Introduction

Noise surrounds us; it is a constant presence in everyday life. A noisy community can be an excellent indicator of a healthy community: the noise from busy shops, children playing, and public transportation are all signs of a thriving environment. Noise is often defined subjectively, surrounding busy transportation corridors, recreational areas, construction zones, and schools as unwanted sound, while welcomed when supporting the presence of activity in a commercial business area. In addition, some development goals, such as infill, may create acceptably higher levels of noise. The purpose of the noise element is to ensure that a local planning area limits the exposure of the community to excessive noise levels in noise-sensitive areas and at noise-sensitive times of day.

In 1976, the Department of Health Services Office of Noise Control issued the first Noise Element Guidelines pursuant to Health and Safety Code section 46050.1, followed shortly thereafter by a model noise ordinance.

Although the Office of Noise Control no longer exists, the principles that it developed are still valid and widely used. Its Noise Element Guidelines, which are in Appendix D, are an additional resource that local governments may consult in addition to this chapter to develop noise elements.

Government Code 65302(f):

(1) A noise element that shall identify and appraise noise problems in the community. The noise element shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:

(A) Highways and freeways.

(B) Primary arterials and major local streets.

(C) Passenger and freight online railroad operations and ground rapid transit systems.

(D) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.

(E) Local industrial plants, including, but not limited to, railroad classification yards.

(F) Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.

(2) Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.

(3) The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.

(4) The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

Many noise related planning resources are available. The Caltrans Office of Transportation Laboratory publishes the Traffic Noise Analysis Protocol and numerous reports on mitigating transportation noise. The California Airport Land Use Planning Handbook, published by Caltrans' Division of Aeronautics, includes noise information relating to airports. The Federal Highway Administration has published multiple noise reports, including a Construction Noise Handbook, Highway Traffic Noise: Analysis and Abatement Guide, Transit Noise and Vibration Impact Assessment, and Synthesis of Noise Effects on Wildlife Populations.

The process to create the noise element should include, but is not limited to, the following steps:

- Survey the community to determine the type, location and extent of noise incompatibility in the community
- Explore methods of noise attenuation to minimize exposure to excessive noise
- Research methods to protect residences and other sensitive receptors from excessive noise
- Draft implementation measures that offer solutions to existing and foreseeable noise problems

CORRELATIONS AMONG ELEMENTS

	Land Use	Circulation	Housing	Conservation	Open Space	Safety	EJ
Noise	IN STATUTE	IN STATUTE	RELATED	-	RELATED	-	RELATED

■ Identified in statute ■ Closely related to statutory requirements

Completeness Checklist

Local agency staff can use the following checklist to help ensure that the noise element addresses all required issues. Please note that use of this checklist is purely advisory, and only contains issues that are legally required by Government Code section 65302 (f). Noise elements may address additional issues at the discretion of the local government. Because general plan formats may vary, this checklist suggests identifying where the particular government code provision is satisfied.

Statutory Citation	Brief Description of Requirement
Gov. Code § 65302(f)(1)	(1) A noise element that shall identify and appraise noise problems in the community and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources: (A) Highways and freeways.
Gov. Code § 65302 (f)(1)(B)	(B) Primary arterials and major local streets.
Gov. Code § 65302 (f)(1)(C)	(C) Passenger and freight online railroad operations and ground rapid transit systems.
Gov. Code §65302 (f)(1)(D)	(D) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.
Gov. Code § 65302(f)(1)(E)	(E) Local industrial plants, including, but not limited to, railroad classification yards
Gov. Code § 65302 (f)(1)(F)	(F) Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment
Gov. Code § 65302(f)(2)	(2) Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.
Gov. Code § 65302(f)(3)	(3) The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.
Gov. Code § 65302(f)(4)	(4) The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

Required Contents

The noise element should utilize the most accurate and up-to-date information available to reflect the noise environment, stationary sources of noise, predicted levels of noise, and the impacts of noise on local residents. It should be as detailed as necessary to describe the local situation and offer solutions to local noise issues. It must include the considerations of noise levels from:

(A) Highways and freeways.

(B) Primary arterials and major local streets.

(C) Passenger and freight online railroad operations and ground rapid transit systems.

(D) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.

(E) Local industrial plants, including, but not limited to, railroad classification yards.

(F) Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.

The general plan's noise element must show contours for these noise sources, to the extent practicable, in either Community Noise Equivalent Levels (CNEL) or Day-Night Average Level (Ldn). These noise contours must be prepared using noise monitoring or accepted noise-modeling techniques. The noise contours must be used as a guide to establish a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise (Gov. Code § 65302 (f)(2), (f)(3)). The noise element must include implementation measures and possible solutions to existing and foreseeable noise issues. Furthermore, the policies and standards must be sufficient to serve as a guideline for compliance with the state's noise insulation standards (Gov. Code § 65302(f)(4)).

The noise element should be used to guide decisions concerning land use and the location of new roads and transit facilities since these are common sources of excessive noise levels. Proposed land uses should be analyzed to ensure they are compatible with existing uses in the surrounding area, especially residential developments and sensitive receptors, such as schools, hospitals, and places of worship. Additionally, construction noise, especially in urban areas, can be mitigated with policies such as limiting construction hours or days.

Definitions

Decibel, dB: A unit of measurement describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

A-Weighted Level: The sound level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

L10: The A-weighted sound level that is exceeded ten percent of the sample time. Similarly, L50, L90, etc.

Leq: Equivalent energy level. The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq is typically computed over 1-, 8-, and 24-hour sample periods.

CNEL: Community Noise Equivalent Level. The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night from 10 p.m. to 7 a.m.

Ldn: Day-Night Average Level. The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of 10 decibels to sound levels in the night after 10 p.m. and before 7 a.m. (Note: CNEL and Ldn represent daily levels of noise exposure averaged on an annual or daily basis, while Leq represents the equivalent energy noise exposure for a shorter time period, typically one hour.)

Noise Contours: Lines drawn about a noise source indicating equal levels of noise exposure. CNEL and Ldn are the metrics utilized herein to describe annoyance due to noise and to establish land use planning criteria for noise.

Ambient Noise: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Intrusive Noise: That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence, and tonal or informational content as well as the prevailing noise level.

Noisiness Zones: Defined areas within a community wherein the ambient noise levels are generally similar (within a range of 5 dB, for example). Typically, all other things being equal, sites within any given noise zone will be of comparable proximity to major noise sources. Noise contours define different noisiness zones.

Local airports are subject to the noise requirements of the Federal Aviation Administration and noise standards under the California Code of Regulations, Title 21, section 5000, et seq. These standards are designed to encourage the airport proprietor, aircraft operators, local governments, pilots, and Caltrans to work cooperatively to diminish excessive aircraft noise impacts. However, the U.S. Secretary of Transportation must review and approve all local airport noise and access restrictions adopted after 1990, and they must meet specified criteria (49 U.S.C. § 47524).

Proposed school sites within two nautical miles of an airport runway or potential runway in an airport master plan are subject to review by CalTrans Division of Aeronautics (Cal. Code Regs., tit. 21, § 3570, and Ed. Code § 17215). The regulations authorize CalTrans to object to the acquisition or lease of a school site within a 65 decibel annual CNEL aircraft noise contour. If Caltrans recommends against it based on noise considerations, the board may not acquire or lease the site (Ed. Code § 17215(d)).

Specific considerations for noise generated by or related to military facilities can be found in the California Advisory Handbook for Community and Military Compatibility Planning.

Noise Measurement and Modeling

The local planning agency should select the method of measurement or modeling that best suits its needs, either CNEL or Ldn. See Appendix D for more information about these two types of noise measurements and noise descriptors.

Noise should be measured at multiple receptors. The volume of traffic noise, construction noise, and the noise of an environment (such as loud schools, playgrounds, or agricultural areas) depends on many factors, including the location of dwellings and the location and types of trips made in neighborhoods en route to school, work, or shopping.[iv] Measuring noise at multiple receptors throughout a community will ensure that the noise element is accurate. The noise element should address the following:

- Major noise sources, both mobile and stationary
- Ground borne noise, ground borne vibration from public transit, freight trains, or light rail transit lines

- Existing and projected levels of noise and noise contours for major noise sources
- Existing and projected land uses in relation to existing and projected noise sources
- Existing and proposed sensitive receptors, including:
  - » Residential land uses
  - » Hospitals
  - » Convalescent homes
  - » Schools
  - » Churches
  - » Sensitive wildlife habitat, including the habitat of rare, threatened, or endangered species
- Time-of-day, day-of-week, or seasonable variability of noise sources

Projections of future noise sources, noise levels, and anticipated impacts, including health impacts, upon existing and proposed land uses should provide information useful for guiding decisions about land use, locations of noise generating sources, and noise reduction mitigation measures. Mapping noise contours creates an opportunity to engage the community in a practical discussion about noise, and the tradeoffs between noise and other local priorities.

Mitigation Measures

Not all noise can be minimized, and there may even be areas where noise is desired. Some noise sources are inherent to a region, such as noise generated from farming activities in agriculture intensive areas, wildlife noise from nearby habitat, and noise associated with urban infill developments. Creating healthy communities includes minimizing harmful exposure to excessive noise. Local planning areas are encouraged to embrace the noise characteristics inherent to their region and "design with noise in mind" to minimize harmful exposure to excessive noise.

There are many ways to minimize harmful exposure to excessive noise. Mitigation measures include soundproofing with soundproof windows and insulation, landscaping and berms, building design and setbacks, buffer areas, operating hours of major sources, roadway maintenance and traffic flow, quieter pavement strategies, and other techniques.

Noise mitigation measures are not one-size-fits-all solutions: some noise mitigation measures are better suited for some communities than others. For example, while sound walls may be a fitting mitigation measure for a rural area, they may not be the best solution for urban infill areas, because they impair community connectivity. Increased building setback zones or buffer zones are likely not appropriate in more urban areas where land is limited. In areas where available land is limited, alternative mitigation measures should be employed. The noise element should be flexible and consider the different needs of various communities to determine the best measures to minimize exposure to excessive noise.

Caltrans administers several freeway noise control programs. In general, these are applied to residential and school uses that existed before a freeway was constructed. For instance, the New Construction or Reconstruction and Community Noise Abatement programs

provide for installation of noise attenuating walls. In addition, the School Noise Abatement Program funds acoustical attenuation of classrooms. Considering possible co-benefits, such as safety improvements, and potential negative implications of soundwalls, such as community isolation and disconnection, is essential to ensure noise mitigation is effective and unobtrusive.

Implementation Measures

Implementation of the noise element may require a variety of methods. Some tools communities may use include

- The adoption of noise impact and attenuation standards, consistent with the noise element guidelines and the Uniform Building Code
- Guidance for zoning and development through the adoption of specified noise mitigation
- The establishment of local standards and guidelines for noise evaluation, including baseline specifications. The evaluation of new residential and other sensitive uses for consistency with noise standards in areas adjacent to major sources of noise
- The review of all land use and development proposals for compliance with noise and land use compatibility standards
- The control of stationary noise at the source through the use of insulation, berms, building design/orientation, buffer areas, staggered operating hours, and other techniques
- The correlation of noise element concerns with the objectives, policies, and plan proposals of the land use, circulation, and open-space elements in order to minimize community noise exposure
- Noise control ordinances-generally used to resolve short-term noise problems, but they can also be helpful when evaluating development that might create a nuisance, or expansion of a major source near sensitive receptors.

Noise can be the sign of a vibrant community if planned for at appropriate levels and hours

Image by Urban Advantage, Peerless Green

Other Considerations

Noise and Health

Exposure to excessive noise can have health impacts.[v] The most common health impact from excessive noise exposure is sleep disturbance. Sleep disturbance can impair cognitive performance, and alter hormone levels, heart rate, sleep patterns, and mood. Other potential health impacts from exposure to excessive noise include increased levels of hypertension, high blood pressure, and cardiovascular disease.[vi]

There are multiple options to minimize excessive noise exposure and reduce potential health impacts. Minimization measures such as soundproofing a residence to reduce outdoor-to-indoor noise and requiring new residences to place bedrooms in the quietest part of the floor plan will minimize exposure to excessive noise and reduce potential health risks.

Ground-borne Vibration and Infill Development Considerations

Ground-borne vibration is manmade noise caused by oscillations of the ground due to explosions, construction, or railway and transit movement. Especially for local planning areas where sensitive use areas are, or will be, located near transit centers or railway lines, ground-borne vibration should be included in the noise element. Ground-borne vibration is already included in the noise section of the California Environmental Quality Act (CEQA) Guidelines Environmental Review Checklist (Cal. Code Regs., tit. 14, § 15000 et seq., Appendix G, subd. XII (b)). Addressing ground-borne vibration in the noise element of a general plan will ensure greater consistency between a general plan and CEQA.

Rail and public transit are key tools for infill development, which helps reduce greenhouse gas emissions and is encouraged as part of the State's planning priorities. Ground-borne vibration associated with new rail and transit should be considered and mitigated during the planning process.

Ground-borne vibration from cars and buses is usually caused by rough or uneven roadways. The repair of any bumps, cracks, and potholes on the roadway surface will dramatically reduce or solve ground-borne vibration from vehicles.

Ground-borne vibration from rail systems typically stems from degraded wheel and rail surfaces. Routine maintenance of wheel and rail surfaces is critical to control ground-borne vibration. When vibration persists despite routine wheel and rail maintenance, other solutions to control vibration from rail systems include:

- Special track support systems such as floating slabs, resiliency supported ties, high reliance fasteners and ballast mats
- Trenches along the railway to act as a vibration barrier
- Reduction in vehicle speed near sensitive use sites
- Building modifications for nearby buildings with vibration-sensitive equipment affected by rail vibration
- Expansion of the rail right-of-way or purchase of a vibration easement

The Federal Transit Authority (FTA) Transit Noise and Vibration Impact Assessment contains further guidelines on ground-borne vibration and various mitigation strategies.

Ground-borne vibration is especially relevant for areas near the route of California's High Speed Rail. The project will stretch from Sacramento to San Diego, with up to twenty-four stations. The project will also invest in local and regional rail lines. Areas near the High Speed Rail route should consider effects of ground-borne vibration in their noise element. See the project's Environmental Impact Report/Statement Noise and Vibration Mitigation Guidelines Technical Appendix for more information.

4

Resources

Infill Development

- ChangeLab Building in Healthy Infill

Traffic Noise

- Caltrans Quieter Pavement Research Plan
- Caltrans Traffic Noise Analysis Protocol
- Federal Highway Administration Highway Traffic Noise: Analysis and Abatement Guide
- Caltrans Noise and Vibration Studies
- Caltrans Technical Noise Supplement
- Federal Highway Administration's Traffic Noise Model
- Federal Highway Administration, Highway Traffic Noise, Construction Noise Handbook
- Federal Highway Administration, Synthesis of Noise Effects on Wildlife Populations

Airport Noise

- Caltrans Airport Land Use Planning Handbook
- Federal Aviation Administration, Policy, International Affairs and Environment Noise and Emissions

Public Health

- World Health Organization Burden of Disease from Environmental Noise
- World Health Organization Guidelines for Community Noise

Groundborne Vibration Noise

- Federal Transit Authority (FTA) Transit Noise and Vibration Impact Assessment

Construction Noise

- Caltrans Transportation and Construction Vibration Guidance Manual

Military Compatibility Considerations

- California Advisory Handbook for Community and Military Compatibility Planning

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Identify noise sensitive land uses within high impact noise areas	Map of noise contours, land use designations
Plan for potential construction noise in residential areas	Map of planned development areas

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate. A full list of recommended policies can be found here.

Sample Policy	Example of Application	Relationship to Other Elements
[City/county] shall avoid placing noise sensitive land uses (e.g. residential, hospitals, assisted living facilities, group homes, schools, day care centers, etc.) within the high noise impact areas (over 65 dB CNEL) for (designated airports) in accordance with the (city/county) Airport Land Use Compatibility Plan	City of Riverside	Land use, circulation, healthy communities
[City/county] shall orient buildings such that the noise sensitive portions of a project are shielded from noise sources.	City of San Diego	Land use, circulation, housing, healthy communities
[City/county] shall require new development to include noise mitigation to assure acceptable interior noise levels appropriate to the land use type: 45 dBA Ldn for residential, transient lodgings, hospitals, nursing homes and other uses where people normally sleep; and 45 dBA L eq (peak hour) for office buildings and similar uses.	City of Sacramento	Land use, housing, healthy communities
[City/county] shall protect schools, hospitals, libraries, churches, convalescent homes, and other noise sensitive uses from excessive noise levels by incorporating site planning and project design techniques to minimize noise impacts. The use of noise barriers shall be considered after all practical design-related noise measures have been integrated into the project. In cases where sound walls are necessary, they should help create an attractive setting with features such as setbacks, changes in alignment, detail and texture, murals, pedestrian access (if appropriate), and landscaping	City of Murrieta	Land use, equitable and resilient communities, healthy communities
[City/county] shall integrate noise considerations into land use planning decisions to prevent new noise/land use conflicts.	City of Murrieta	Land use

4

Safety Element

Introduction

The goal of the safety element is to reduce the potential short and long-term risk of death, injuries, property damage, and economic and social dislocation resulting from fires, floods, droughts, earthquakes, landslides, climate change, and other hazards. Other locally relevant safety issues, such as airport land use, emergency response, hazardous materials spills, and crime reduction, may also be included. Some local jurisdictions have chosen to incorporate their hazardous waste management plans into their safety elements.

The safety element directly relates to topics also mandated in the (1) land use, (2) conservation, (3) environmental justice and (4) open-space elements, as development plans must adequately account for public safety considerations and open space for public health and ecological benefits often incorporate areas of increased hazard risk. The safety element must identify hazards and hazard abatement provisions to guide local decisions related to zoning, subdivisions, and entitlement permits. The safety element should also contain general hazard and risk reduction strategies complementary with those of the Local Hazard Mitigation Plan (LHMP). Ideally, the LHMP will be incorporated into the safety element as outlined below in accordance with provision of Assembly Bill 2140, General Plans: Safety Element (Hancock, 2006)(Gov. Code § 65302.6).

The recent introduction of climate risk to the discussion of the safety element, adds a focus on longer term preparation of a community for a changing climate. Policies in a safety element should identify hazards and emergency response priorities, as well as mitigation through avoidance of hazards by new projects and reduction of risk in developed areas. As California confronts mounting climate change impacts, local governments are now required, in accordance with Senate Bill 379, Land Use: General Plan: Safety Element (Jackson, 2015) to include a climate change vulnerability assessment, measures to address vulnerabilities, and comprehensive hazard mitigation and emergency response strategy as explained further in this section

Government Code 65302(g):

(g) (1) A safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence; liquefaction; and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body; flooding; and wildland and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, military installations, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

(Gov. Code § 65302(g)(4)). Policies may include methods of minimizing risks, as well as ways to minimize economic disruption and expedite recovery following disasters. Since virtually all incidents disproportionately affect individuals with access and functional needs (AFN) (i.e. people with disabilities, seniors, children, limited English proficiency, and transportation disadvantaged). All policies should include consideration of AFN populations.

Climate change will affect and potentially exacerbate the impact of other hazards rather than being solely a distinct hazard with unique impacts. For example, extreme heat and heat waves are existing hazards that will be exacerbated by climate change. The impacts of climate change on the frequency, timing, and magnitude of flooding vary by geography throughout the state. Areas that experience early run off from snow melt coupled with intensified rain or coastal areas experiencing sea level rise may be more greatly impacted by flooding. Hazards that have the potential to be affected by climate change are further outlined in this element and linked resources described below.

Assembly Bill 2140

The federal Disaster Mitigation Act of 2000 (42 U.S.C. § 5121 et seq.), outlines how a Local Hazard Mitigation Plan (LHMP) can be developed individually or through a multi-jurisdictional LHMP. The successful completion of an LHMP makes the jurisdiction eligible to apply for federal Hazard Mitigation Grant Program (HMGP) post-disaster funding, Pre-Disaster Mitigation (PDM) funding or Flood Management Assistance (FMA) funding. See reference in the 44 CFR, Section 201.6(a) and 201.6(a)(2)

At the state level, AB 2140 authorizes local governments to adopt their LHMPs with the safety elements of their general plans (Gov. Code § 65302.6). Integration or incorporation by reference is encouraged through a post-disaster financial incentive that authorizes the state to use available California Disaster Assistance Act funds to cover local shares of the 25% non-federal portion of grant-funded post-disaster projects when approved by the legislature (Gov. Code § 8685.9).

AB 2140 is one of the most important links between general plans and hazard mitigation in California. Adopting the LHMP with the safety element provides a vehicle for implementation of the LHMP. This integration allows hazard mitigation strategies to be

Climate Change

An increasingly important factor affecting disaster management functions is climate change. Climate change reflects new uncertainties and factors shaping and conditioning hazard mitigation planning. Chapter 4.5 in the 2013 California State Hazard Mitigation Plan (SHMP) addresses a specific approach for local communities to evaluate their risk as a result of climate change. The safety element of the general plan plays an important role in ensuring consistency with the Local Hazard Mitigation Plan (LHMP) and the SHMP. The general plan and LHMP both provide a local vehicle for implementation of the SHMP, including the provisions dealing with climate change. The SHMP outlines tools, resources, and a process for addressing climate change at the local level. The resources the SHMP and LHMP guidance materials reference are the same materials referenced in Chapter 8 of the General Plan Guidelines, Climate Change. This provides for consistency across multiple documents such as an adaptation plan, climate action plan, general plan, implementation plan, local hazard mitigation plan, etc.

implemented and local hazard awareness to be upgraded and enhanced. An LHMP must document what existing plans, studies, reports, and technical information were reviewed during the formation of the plan, as well as if and how any of that information was incorporated into the final product (44 CFR, Section 201.6(b)(3)).

Completeness Checklist

Local agency staff can use the following checklist to help ensure that the safety element addresses all required issues. Please note that use of this checklist is purely advisory, and only contains issues that are legally required by Government Code section 65302(g). Safety elements may address additional issues at the discretion of the local government. Because general plan formats may vary, this checklist suggests identifying where the particular government code provision is satisfied.

Statutory Citation	Brief Description of Requirement
Gov. Code § 65302(g)(1)	Identification of unreasonable risks and policies for the protection of the community from such risks.
Gov. Code § 65302(g)(1)	Slope Instability Slope instability leading to mudslides and landslides.
Gov. Code § 65302(g)(1)	Seismic risks, including: Seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; subsidence, liquefaction, and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body • Mapping of known seismic and other geologic hazards. • Address o Evacuation routes o Military installations o Peakload water supply requirements, and o Minimum road widths and clearances around structures
Gov. Code § 65302(g)(2)	Flooding Identify • Flood Hazard Zones • FEMA Flood Insurance Maps • Army Corps of Engineer Flood information • Flood maps from the Central Valley Flood Protection Board • Dam Failure Maps (Office of Emergency Services) • DWR Floodplain Maps • Maps of Levee Protection Zones • Areas subject to inundation in the event of the failure of levees and floodwalls • Historic flood information • Existing and planned development in flood hazard areas • Agencies with responsibility for flood protection Mandatory Goals, Policies, and Objectives • Avoid and minimize flood risks for new development. • Should new development be located in flood hazard zones? If so, what are appropriate mitigation measures? • Maintain the integrity of essential public facilities. • Locate, when feasible, new essential public facilities outside of flood hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities, or identifying mitigation measures. • Establishing cooperative working relationships among public agencies with responsibility for flood protection. Feasible Mitigation Measures, to implement the policies above.

Statutory Citation	Brief Description of Requirement
Gov. Code § 65302(g)(3)	Wildland and Urban Fires Identification of, and policies for, the protection of the community from, any unreasonable risks associated with wildland and urban fires. State Responsibility Areas and Very High Fire Hazard Severity Zones Consider advice in OPR's Fire Hazard Technical Advisory Identify • CALFire Fire Hazard Severity Zone Maps • Historical data on wildfires • USGS wildfire hazard areas • Existing and planned development within these areas • Agencies with responsibility for fire protection in these areas Mandatory Goals, Policies and Objectives • Protect the community from unreasonable risks • See mitigation measures below. Feasible Mitigation • Avoid and minimize fire risks for new development. • Should new development be located in fire hazard zones? If so, what are appropriate mitigation measures? • Maintain the integrity of essential public facilities. • Locate, when feasible, new essential public facilities outside of fire hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities, • If essential facilities are located in high fire zones, identify mitigation measures, such as safe access for emergency response vehicles, visible street signs, and water supplies for structural fire suppression. • Establishing cooperative working relationships among public agencies with responsibility for fire protection.
Gov. Code § 65302(g)(4)	Climate Change Adaptation and Resilience Address climate change adaptation and resiliency strategies by using the process in the Adaptation Planning Guide and reflected in referenced tools such as Cal-Adapt. Vulnerability Assessment (Gov. Code § 65302(g)(4)(A)) Create a vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, the following: • Information that may be available from federal, state, regional, and local agencies that will assist in developing the vulnerability assessment and the adaptation policies and strategies, including, but not limited to, all of the following: (I) Information from the Internet based Cal-Adapt tool. (II) Information from the most recent version of the California Adaptation Planning Guide. (III) Information from local agencies on the types of assets, resources, and populations that will be sensitive to various climate change exposures. (IV) Information from local agencies on their current ability to deal with the impacts of climate change. (V) Historical data on natural events and hazards, including locally prepared maps of areas subject to previous risk, areas that are vulnerable, and sites that have been repeatedly damaged. (VI) Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public facilities. (VII) Federal, state, regional, and local agencies with responsibility for the protection of public health and safety and the environment, including special districts and local offices of emergency services. Mandatory Goals, Policies and Objectives (Gov. Code § 65302(g)(4)(B)) • Create a set of adaptation and resilience goals, policies, and objectives based on the information above for the protection of the community.

Statutory Citation	Brief Description of Requirement
Gov. Code § 65302(g)(4) CONTINUED	Feasible Mitigation (Gov. Code § 65302(g)(4)(C)) • Create a set of feasible implementation measures designed to carry out the goals, policies, and objectives identified above, including, but not limited to, all of the following: (i) Feasible methods to avoid or minimize climate change impacts associated with new uses of land. (ii) The location, when feasible, of new essential public facilities outside of at-risk areas, including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in at-risk areas. (iii) The designation of adequate and feasible infrastructure located in an at-risk area. (iv) Guidelines for working cooperatively with relevant local, regional, state, and federal agencies. (v) The identification of natural infrastructure that may be used in adaptation projects, where feasible. Where feasible, the plan shall use existing natural features and ecosystem processes, or the restoration of natural features and ecosystem processes, when developing alternatives for consideration. For the purposes of this clause, "natural infrastructure" means the preservation or restoration of ecological systems, or utilization of engineered systems that use ecological processes, to increase resiliency to climate change, manage other environmental hazards, or both. This may include, but is not limited to, floodplain and wetlands restoration or preservation, combining levees with restored natural systems to reduce flood risk, and urban tree planting to mitigate high heat days. Other documents (Gov. Code §§ 65302(g)(4)(D)(i), 65302(g)(4)(D)(ii): • If a city or county has adopted the local hazard mitigation plan, or other climate adaptation plan or document that fulfills commensurate goals and objectives and contains the information required pursuant to this paragraph, separate from the general plan, an attachment of, or reference to, the local hazard mitigation plan or other climate adaptation plan or document. • Cities or counties that have an adopted hazard mitigation plan, or other climate adaptation plan or document that substantially complies with this section, or have substantially equivalent provisions to this subdivision in their general plans, may use that information in the safety element to comply with this subdivision, and shall summarize and incorporate by reference into the safety element the other general plan provisions, climate adaptation plan or document, specifically showing how each requirement of this subdivision has been met.
Gov. Code 65302(g)(5) – (g)(8)	Other Considerations: • Cities and counties that have flood plain management ordinances that have been approved by FEMA that substantially comply with this section, or have substantially equivalent provisions to this subdivision in their general plans, may use that information in the safety element to comply with this subdivision, and shall summarize and incorporate by reference into the safety element the other general plan provisions or the flood plain ordinance, specifically showing how each requirement of this subdivision has been met. • Prior to the periodic review of its general plan and prior to preparing or revising its safety element, each city and county shall consult the California Geological Survey of the Department of Conservation, the Central Valley Flood Protection Board, if the city or county is located within the boundaries of the Sacramento and San Joaquin Drainage District, as set forth in Section 8501 of the Water Code, and the Office of Emergency Services for the purpose of including information known by and available to the department, the agency, and the board required by this subdivision. • To the extent that a county's safety element is sufficiently detailed and contains appropriate policies and programs for adoption by a city, a city may adopt that portion of the county's safety element that pertains to the city's planning area in satisfaction of the requirement imposed by this subdivision • Review the safety element for fire and flood impacts upon each Housing Element update, • Review the safety element for climate change at each update to the Local Hazard Mitigation Plan, Jurisdiction may also choose to do a comprehensive review of the safety element upon each housing element update to streamline review.

CORRELATIONS AMONG ELEMENTS

	Land Use	Circulation	Housing	Conservation	Open Space	Noise	Air Quality	EJ
Safety	IN STATUTE	RELATED	RELATED	IN STATUTE	RELATED	-	RELATED	RELATED

■ Identified in statute ■ Closely related to statutory requirements

4

Required Contents

The safety element must, consistent with Government Code Section 65302(g), provide for the protection of the community from any unreasonable risks associated with the effects of:

- Seismically induced surface rupture, ground shaking, ground failure
- Tsunami, seiche, and dam failure
- Slope instability leading to mudslides and landslides
- Subsidence
- Liquefaction
- Other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body
- Flooding
- Wildland and urban fires
- Climate change

The safety element must include mapping of known seismic and other geologic hazards. It must also address evacuation routes, military installations, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

The safety element must also identify information regarding flood hazards, establish a set of comprehensive goals, policies, and objectives for the protection of the community from the unreasonable risks of flooding, and establish a set of feasible implementation measures designed to carry out the goals, policies, and objectives for flood protection. It is recommended that the safety element do the same for drought impacts.

The safety element must also be reviewed and updated as necessary to address the risk of fire for land classified as

Changes in planning and design can increase community safety and resilience

Image by Urban Advantage, Cunningham Quill | Architects

state responsibility areas and land classified as very high fire hazard severity zones. Because climate change will likely increase California's frequency and intensity of fire weather conditions, even historically less vulnerable regions should reevaluate wildfire risk and prevention strategies in their general plan's safety element.

Most of the information needed to complete the analysis for the safety element, can be obtained through a combination of sources: the State Hazard Mitigation Plan and federal requirements outlined in the Disaster Mitigation Act (DMA) of 2000, MyPlan tool, the General Plan Mapping Tool, Cal-Adapt and the Adaptation Planning Guide (APG). Some information may need to be generated at the local or regional level, particularly for those facilities considered critical to the community.

Consultation Requirements

Before the periodic review of its general plan and before preparing or revising its safety element, each city and county shall consult the California Geological Survey of the Department of Conservation, the Central Valley Flood Protection Board, if the city or county is located within the boundaries of the Sacramento and San Joaquin Drainage District, as set forth in Section 8501 of the Water Code, and the Office of Emergency Services for the purpose of including information known by and available to the department, the agency, and the board required by this subdivision. In particular, the Office of Emergency Services can assist local governments with developing their safety element and aligning general plan strategies with those of the local hazard mitigation and emergency operation plans to ensure consistency. The Governor's Office of Planning and Research's Integrated Climate Adaptation and Resiliency Program (ICARP), established by SB 246 (Wieckowski, 2015), also supports local government's compliance with SB 379 (Pub. Resources Code § 71350 et seq.).

Each city and county must provide a draft of its safety element or amendment of its safety element to the California Geological Survey of the Department of Conservation prior to adoption, for review to determine if all known seismic and other geologic hazards are addressed (Gov. Code § 65302.5)(a)). A city or county that contains a state fire responsibility area or a very high fire hazard severity zone must provide a draft of its safety element or amendment of its safety element to the State Board of Forestry and Fire Protection for review before adoption, and the Board may recommend changes regarding uses of land, policies, or strategies for reducing fire risk (Id. at § 65302.5)(b)). Similarly, each city and county located in the Sacramento and San Joaquin Drainage District must provide a draft of its safety element or amendment of its safety element to the Central Valley Flood Protection Board before adoption, and the Board may provide recommended changes regarding uses of land, policies, or strategies for reducing flood risk and protecting areas subject to flooding (Id. at § 65302.7).

Statutory Requirements

This section offers a general guide to the contents of the safety element. Note that while the focus is on the minimum requirements for an adequate safety element, an effective general plan will focus more extensively on those issues of greatest relevance to the community. The effects of climate change in particular will influence emergency management issues through varying impacts across local communities statewide. Increases in average temperature, a greater incidence of extreme weather conditions, and sea level rise all will not only exacerbate existing hazards mentioned in this section, but may also create new hazards where none previously existed.

4

Useful Definitions

Alquist-Priolo Earthquake Fault Zone: A regulatory zone, delineated by the State Geologist, within which site-specific geologic studies are required to identify and avoid fault rupture hazards prior to subdivision of land and/or construction of most structures for human occupancy.

Climate Adaptation: Adjustment or preparation of natural or human systems to a new or changing environment that moderates harm or exploits beneficial opportunities.

Climate Mitigation (Greenhouse Gas Emissions Reductions): A human intervention to reduce the human impact on the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks. Refer to Chapter 7, Climate Change, for more information.

Critical Facility: Facilities that either (1) provide emergency services or (2) house or serve many people who would be injured or killed in case of disaster damage to the facility. Examples include hospitals, fire stations, police and emergency services facilities, utility facilities, and communications facilities.

Extreme Weather Event: In most cases, extreme weather events are defined as lying in the outermost ("most unusual") ten percent of a place's history. Analyses are available at the national and regional levels.

Fault: A fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side. A fault zone is a zone of related faults which commonly are braided, but which may be branching. A fault trace is the line formed by the intersection of a fault and the earth's surface.

Active Fault: A fault that has exhibited surface displacement within Holocene time (approximately the past 11,000 years).

Potentially Active Fault: A fault that shows evidence of surface displacement during Quaternary time (the last 2 million years).

Flooding: A rise in the level of a water body or the rapid accumulation of runoff, including related mudslides and land subsidence, that results in the temporary inundation of land that is usually dry. Riverine flooding, coastal flooding, mud flows, lake flooding, alluvial fan flooding, flash flooding, levee failures, tsunamis, and fluvial stream flooding are among the many forms that flooding takes.

Ground Failure: Mudslide, landslide, liquefaction or soil compaction.

Hazardous Building: A building that may be hazardous to life in the event of an earthquake because of partial or complete collapse. Hazardous buildings may include:

(1) Those constructed prior to the adoption and enforcement of local codes requiring earthquake resistant building design.

(2) Those constructed of unreinforced masonry.

(3) Those which exhibit any of the following characteristics:

- exterior parapets or ornamentation which may fall on passersby
- exterior walls that are not anchored to the floors, roof, or foundation
- sheeting on roofs or floors incapable of withstanding lateral loads
- large openings in walls that may cause damage from torsional forces
- lack of an effective system to resist lateral forces
- non-ductile concrete frame construction

Hazardous Material: An injurious substance, including pesticides, herbicides, toxic metals and chemicals, liquefied natural gas, explosives, volatile chemicals, and nuclear fuels.

Hazard Mitigation: Sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects.

Landslide: A general term for a falling, sliding, or flowing mass of soil, rocks, water, and debris. Includes mudslides, debris flows, and debris torrents.

Liquefaction: A process by which water-saturated granular soils transform from a solid to a liquid state during strong ground shaking.

Maladaptation: Any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead.

Natural Infrastructure: The preservation or restoration of ecological systems, or utilization of engineered systems that use ecological processes, to increase resiliency to climate change, manage other environmental hazards, or both. This may include, but is not limited to, floodplain and wetlands restoration or preservation, combining levees with restored natural systems to reduce flood risk, and urban tree planting to mitigate high heat days.

Peakload Water Supply: The supply of water available to meet both domestic water and fire fighting needs during the particular season and time of day when domestic water demand on a water system is at its peak.

Resilience: The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

Seiche: An earthquake-induced wave in a lake, reservoir, or harbor.

Seismic Hazard Zone: A regulatory zone, delineated by the State Geologist, within which site-specific geologic, soils, and foundation engineering studies are required to identify and avoid earthquake-caused ground-failure hazards, or selected other earthquake hazards, prior to subdivision of land and for construction of most structures for human occupancy.

Storm surge: An abnormal rise of water generated by a storm, over and above the predicted astronomical tides.

Subsidence: The gradual, local settling or sinking of the earth's surface with little or no horizontal motion (subsidence is usually the result of gas, oil, or water extraction, hydrocompaction, or peat oxidation, and not the result of a landslide or slope failure).

Seismically Induced Surface Rupture: A break in the ground's surface and associated deformation resulting from the movement of a fault.

Tsunami: A wave, commonly called a tidal wave, caused by an underwater seismic disturbance, such as sudden faulting, landslide, or volcanic activity.

Wildland Fire: A fire occurring in a suburban or rural area that contains uncultivated lands, timber, range, watershed, brush, or grasslands. This includes areas where there is a mingling of developed and undeveloped lands.

Climate Change Adaptation and Resilience

Requirement Description:

In accordance with the requirements of SB 379, codified at Government Code section 65302(g)(4), climate change adaptation and resilience must be addressed in the safety element of all general plans in California. Specifically, "upon the next revision of a local hazard mitigation plan, adopted in accordance with the federal Disaster Mitigation Act of 2000 (Public Law 106-390), on or after January 1, 2017, or, if a local jurisdiction has not adopted a LHMP, beginning on or before January 1, 2022, the safety element shall be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to the city or county. This review shall consider advice provided in the Office of Planning and Research's General Plan Guidelines..." (Gov. Code § 65302(g)(4)). This section provides advice to support a jurisdiction's compliance with the requirements of Government Code section 65302(g)(4).

Government Code 65302(g):

(4) Upon the next revision of a local hazard mitigation plan, adopted in accordance with the federal Disaster Mitigation Act of 2000 (Public Law 106-390), on or after January 1, 2017, or, if a local jurisdiction has not adopted a local hazard mitigation plan, beginning on or before January 1, 2022, the safety element shall be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to the city or county. This review shall consider advice provided in the Office of Planning and Research's General Plan Guidelines and shall include all of the following:

(A) (i) A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including, but not limited to, an assessment of how climate change may affect the risks addressed pursuant to paragraphs (2) and (3).

(ii) Information that may be available from federal, state, regional, and local agencies that will assist in developing the vulnerability assessment and the adaptation policies and strategies required pursuant to subparagraph (B), including, but not limited to, all of the following:

(I) Information from the Internet based Cal-Adapt tool.

(II) Information from the most recent version of the California Adaptation Planning Guide.

(III) Information from local agencies on the types of assets, resources, and populations that will be sensitive to various climate change exposures.

(IV) Information from local agencies on their current ability to deal with the impacts of climate change.

(V) Historical data on natural events and hazards, including locally prepared maps of areas subject to previous risk, areas that are vulnerable, and sites that have been repeatedly damaged.

(VI) Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public facilities.

(VII) Federal, state, regional, and local agencies with responsibility for the protection of public health and safety and the environment, including special districts and local offices of emergency services.

(B) A set of adaptation and resilience goals, policies, and objectives based on the information specified in subparagraph (A) for the protection of the community.

(C) A set of feasible implementation measures designed to carry out the goals, policies, and objectives identified pursuant to subparagraph (B) including, but not limited to, all of the following:

(i) Feasible methods to avoid or minimize climate change impacts associated with new uses of land.

(ii) The location, when feasible, of new essential public facilities outside of at-risk areas, including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in at-risk areas.

(iii) The designation of adequate and feasible infrastructure located in an at-risk area.

(iv) Guidelines for working cooperatively with relevant local, regional, state, and federal agencies.

(v) The identification of natural infrastructure that may be used in adaptation projects, where feasible. Where feasible, the plan shall use existing natural features and ecosystem processes, or the restoration of natural features and ecosystem processes, when developing alternatives for consideration. For the purposes of this clause, "natural infrastructure" means the preservation or restoration of ecological systems, or utilization of engineered systems that use ecological processes,

to increase resiliency to climate change, manage other environmental hazards, or both. This may include, but is not limited to, floodplain and wetlands restoration or preservation, combining levees with restored natural systems to reduce flood risk, and urban tree planting to mitigate high heat days.

(D) (i) If a city or county has adopted the local hazard mitigation plan, or other climate adaptation plan or document that fulfills commensurate goals and objectives and contains the information required pursuant to this paragraph, separate from the general plan, an attachment of, or reference to, the local hazard mitigation plan or other climate adaptation plan or document.

(ii) Cities or counties that have an adopted hazard mitigation plan, or other climate adaptation plan or document that substantially complies with this section, or have substantially equivalent provisions to this subdivision in their general plans, may use that information in the safety element to comply with this subdivision, and shall summarize and incorporate by reference into the safety element the other general plan provisions, climate adaptation plan or document, specifically showing how each requirement of this subdivision has been met.

The safety element discussion is not the only section of the GPG that should address climate change adaptation and resilience. Nearly every other chapter of the GPG outlines how climate change applies to each respective section. The safety element is the statutory "home" for the discussion; however, it should not preclude discussion of climate adaptation and resilience in other appropriate sections of a jurisdiction's general plan. Specifically, addressing a changing climate may result in the need to consider the end year of the general plan and the environmental changes that may occur through the life of a general plan's applicability. As the climate changes, future environmental conditions at the horizon year of the general plan may be just as important for consideration of long range policy as the base environment setting. As climatic systems shift away from a historically predictable paradigm, planning policy should adapt to better incorporate the associated impacts of these anticipated environmental shifts. Further, all major policy documents in a jurisdiction should discuss climate adaptation and resilience, as both an input to and implementation of the jurisdiction's general plan. This will lead to consistency within a jurisdiction's policy framework and ensure implementations of policies are occurring in an efficient and appropriate manner. Examples and cases studies of how this incorporation might occur will be hosted on OPR's Adaptation Clearinghouse.

In some cases, jurisdictions have chosen to address climate change in their community through a climate action plan or adaptation plan. Additional guidance on how a jurisdiction might treat these two types of documents in relationship to the general plan is included in Chapter 8, Climate Change. Many jurisdictions have chosen to address greenhouse gas (GHG) emissions reductions and climate change adaptation together in the same document. The guidance here does not require bifurcating the GHG emissions and adaptation discussions, rather the intent of the policy maker should be to look at the whole of the policy framework to both meet statutory requirements while also maximizing co-benefits of policy initiatives. An outline of a climate action plan that could address both GHG emissions and adaptation is included in Chapter 8, Climate Change and in OPR's Adaptation Clearinghouse.

Timing of Updates

For those jurisdictions that have an adopted local hazard mitigation plan (LHMP), the next update of their LHMP triggers an update to the safety element of the general plan to address climate adaptation and resilience. If a jurisdiction does not have an LHMP, the safety element of the general plan must be reviewed and updated on or before January 1, 2022 to address climate adaptation and resilience. Internal consistency and disclosure of impacts to a community may become problematic if the document is not updated regularly. A jurisdiction may choose to review and update the safety element each time the housing element is updated, as is required for flood and fire hazards. The housing element's five to eight year update cycle may be adequate to regularly review and update the safety element climate change discussions. Jurisdictions that have an LHMP may also choose to review and update their climate change analysis in the LHMP concurrently or as preparation for the next LHMP update to create consistency and efficiency in the review and update cycle for both general plans and LHMPs.

Fulfilling the Objectives of This Section

Some jurisdictions have already completed climate change adaptation analysis. In recognition of this, a city or county may use an existing LHMP or climate adaptation plan to satisfy the requirements of this section. The key to using these stand-alone documents is to both satisfy the requirements of this chapter and to adequately incorporate contents of the plan into the general plan. Likewise, a city or county may use a general plan that currently includes adaptation to satisfy the requirements of this section. If a separate plan is used, it must be incorporated by reference into the safety element and summarized to specifically show how each requirement of this subdivision has been met.

To the extent that a county's safety element is sufficiently detailed and contains appropriate policies and programs for adoption by a city, a city may adopt that portion of the county's safety element that pertains to the city's planning area in satisfaction of the requirement imposed by this subdivision.

Process for Analysis

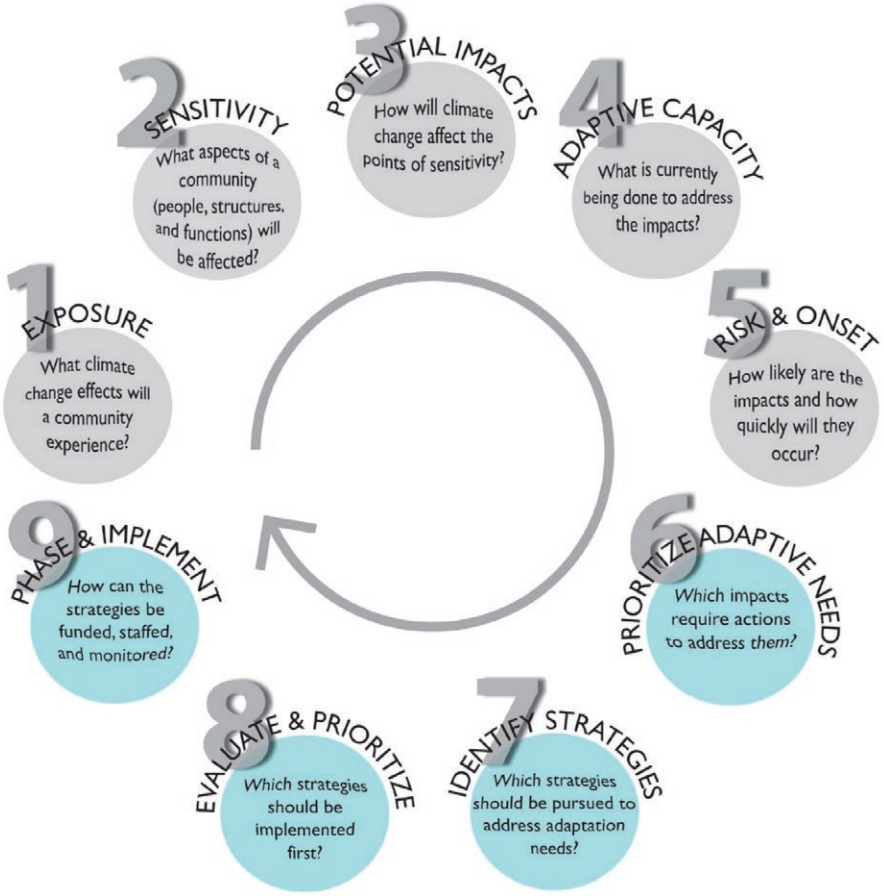
The requirements of SB 379 have five distinct steps (outlined below). The first and last steps focus on the relationship of the analysis and policy efforts of the larger general plan. Steps 2, 3, and 4 focus on how to conduct the recommended analysis, goal setting, and policy development. This process can also be found at the OPR Adaptation Clearinghouse. The five steps require that the jurisdiction:

1. Review the existing LHMP, climate action plan (CAP), adaptation plan and other relevant documents to ensure it meets the requirements of Government Code section 65302(g)(4) as outlined in this chapter. If the LHMP, or plan to address climate adaptation, does not meet the requirements of this chapter, proceed to Step 2. Proceed to step 5 if these requirements have already been satisfied.
2. Conduct a vulnerability assessment.
3. Develop adaptation goals.
4. Create implementation measures.

Complete Adaptation Planning Guide (APG) Process to satisfy these steps

5. Update the safety element with adaptation and resilience considerations consistent with this chapter. This update can be done through incorporation by reference of a plan that meets the requirements of this chapter, through incorporation in entirety of language that meets the requirements, or other appropriate mechanism. When updating the safety element to address climate change, it is important to review other elements of the general plan to ensure consistency.

Steps 2, 3, and 4 respond to the nine step process outlined in the Adaptation Planning Guide (APG).



Source: Adaptation Planning Guide, 2012

The APG is periodically updated in conjunction with updates of the Safeguarding California Plan and State Hazard Mitigation Plan. The next APG update will include updates to address the requirements of Government Code section 65302(g)(4). You can review further detail for each step in the APG in the document.

1. Exposure: What climate change effects will a community experience?
2. Sensitivity: What aspects of a community (people, structures and functions) will be affected?
3. Potential Impacts: How will climate change affect the points of sensitivity?

4. Adaptive Capacity: What is currently being done to address the impacts?
5. Risks and Onset: How likely are the impacts and how quickly will they occur?
6. Prioritize Adaptive Needs: Which impacts require actions to address them?
7. Identify Strategies: Identify the strategies that should be pursued to address adaptation needs?
8. Evaluate and Prioritize: Which strategies should be implemented first?
9. Phase and Implement: How can the strategies be funded, staffed and monitored?

Senate Bill 1000, adopted in 2016, requires local governments to incorporate environmental justice (EJ) policies into their general plans, either in a separate EJ element or by integrating related goals, policies, and objectives throughout the other elements. This update, or revision if the local government already has EJ goals, policies, and objectives, must happen "upon the adoption or next revision of two or more elements concurrently on or after January 1, 2018." Environmental justice should be considered when making decisions about climate change adaptation and resiliency. For additional information on how the new requirement applies to this and other elements in the general plan guidelines, refer to the environmental justice element discussion.

Complete a vulnerability assessment (steps 1-5 of the Adaptation Planning Guide)

As outlined in Government Code section 65302(g)(4) and the APG, the vulnerability analysis should incorporate information from multiple sources. Case studies can also be quite helpful in order to inform a jurisdiction's efforts. Although much of climate adaptation related policy work is an emerging practice, a number of examples are available to provide context. Case studies are available through OPR's Integrated Climate Adaptation Resilience Program (ICARP) "Case Studies" webpage. The results of the Annual Planning Survey and the awareness of efforts occurring in surrounding communities can also be helpful. External resources such as the Climate Resilience Toolkit, Climate Adaptation Knowledge Exchange (CAKEx) and the Georgetown University Adaptation Clearinghouse can also be helpful.

Numerous tools are available to support climate change analysis, such as those referenced in the table in Chapter 8, Climate Change. Specific tools to address climate change adaptation include the following.

TOOLS TO ADDRESS CLIMATE ADAPTATION

Guidelines for CEQA compliance	CEQA Guidelines
Comprehensive framework for addressing adaptation at the local level	APG
Visualization tool for the impacts of climate change and links to resources	Cal-Adapt
Federal resource for visualizing impacts, case studies, decision support	Climate Resilience Toolkit
Guide to developing adaptation policy at the local level in California	Adaptation Planning Guide
Georgetown University Climate Center Adaptation Clearinghouse	Adaptation Clearinghouse
The State's approach to addressing climate impacts	Safeguarding California Plan
The State's framework for climate hazards	State Hazard Mitigation Plan
See also: Chapter 7, Climate Change of the General Plan Guidelines	Chapter 8, Climate
See also: OPR Adaptation Clearinghouse	ICARP

Including the following information will help a jurisdiction satisfy the minimum requirements of Government Code section 65302(g)(4). A deeper level of analysis is encouraged as data, policy and implementation methods continue to improve over time. In all cases, reviewing the information and process guidance in the California Adaptation Planning Guide (APG) should be the first step, in parallel with reviewing data and information in the Cal-Adapt tool. In some cases, working through a regional collaborative such as those working through the Alliance of Regional Collaboratives for Climate Adaptation (ARCCA), to identify partnering opportunities in analysis and implementation may provide value, and in some cases, resources. Regional guidance may differ from guidance provided in this chapter, and may be appropriate as long as it meets the minimum requirements as shown in the safety element checklist. Staff at the ICARP can also answer questions about the available tools and help jurisdictions choose the appropriate resources. New tools and sources of data will be added to the ICARP Adaptation Clearinghouse as they become available. Other important data sources include:

Assessing vulnerability and risk can help a community plan infrastructure in more resilient areas

Image by Urban Advantage, SANDAG

1. Local agency data on the types of assets, resources, and populations that will be sensitive to various climate change exposures. This can be obtained through overlaying Cal-Adapt outputs with the General Plan Mapping Tool (GPMT) and augmenting with locally relevant data. This service will be provided in updates to both tools.

2. Local agency data on current status of climate change preparedness, including institutional capacity, redundancy limitations, critical assets inventory, exposure risk and vulnerability of disadvantaged communities. Sources include municipal service reviews developed by LAFCOs, Metropolitan Planning Organization (MPO) data, other regionally available data, local hazard mitigation planning documents and data in the General Plan Mapping Tool, Cal-Adapt and MyPlan.

3. Historical data on natural events and hazards, including locally prepared risk and vulnerability maps, and sites that have been repeatedly damaged. This information can be obtained by visiting the General Plan Mapping Tool, MyPlan, Cal-Adapt and the Climate Resilience Toolkit in addition to locally available data that may provide more specificity, detail and context.

4. Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public

facilities. Much of this data will only be available at the local level. These can be meshed with downloaded data from the General Plan Mapping Tool, MyPlan and Cal-Adapt.

5. Coordination with federal, state, regional, and local data and information related to protection of public health and safety and the environment, including data from special districts and local offices of emergency services. Through the OPR Adaptation Clearinghouse jurisdictions can access contact information for local, regional, State and federal offices that can assist with this work.

Developing goals and measures for climate change adaptation and resilience (steps 6-9 of the Adaptation Planning Guide)

Jurisdictions must identify a set of adaptation and resilience goals, policies, and objectives, based on the information analyzed in the vulnerability assessment outlined above, for the protection of the community. The "Identifying Adaptation Strategies" chapter of the APG provides a start to this process, and links to other resources. CalAdapt, the OPR Adaptation Clearinghouse and other relevant local, regional, state and federal resources are appropriate to use. In particular, as mentioned in the vulnerability assessment section, regional collaboratives can play a useful role in both identifying policies and coordinating on implementation of those policies. See www.arccacalifornia.org for more information on regional collaboratives and potential partners in your area.

As outlined in the APG, feasible implementation measures must also be developed to ensure the goals, policies, and objectives in the plan are supported through implementing actions. This can be done through the general plan implementation matrix or other mechanism that allows monitoring of progress over time. The structure of the implementation matrix or program may shift depending on whether the climate change discussion is captured in a climate action plan, adaptation plan, or incorporated in the general plan. As with the vulnerability assessment section above, a jurisdiction should start with the APG, then review local or regionally relevant resources, and then review other statewide or national guides as outlined in the table above.

Whenever possible, cities and counties should work with neighboring jurisdictions to develop joint policies and coordinate on joint implementation of policy. Not only does this type of coordination increase policy consistency in a region, but it also may reduce staff and financial cost of implementation. Specific contents required in the climate adaptation discussion include:

1. Feasible methods to avoid or minimize climate change impacts associated with new uses of land. These include, but are not limited to, flooding, fire, extreme heat, sea level rise, runoff, risk, etc.). This should not just capture new risks, but also risks exacerbated by climate change.

2. The location, when feasible, of new essential public facilities outside of at-risk areas, including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in at-risk areas.

3. The designation of adequate and feasible infrastructure located in an at-risk area. Meaning, any new infrastructure should be built to withstand the identified risk.

4. An approach (guidelines) to working cooperatively with relevant local, regional, state, and federal agencies. The APG includes examples of outreach and coordination measures that can be taken to develop these guidelines.

5. The identification of natural infrastructure that may be used in adaptation projects. Where feasible, the plan shall use existing natural features and ecosystem processes, or the restoration of natural features and ecosystem processes, when

developing alternatives for consideration. Additional guidance on natural infrastructure data and resources can be found at the OPR Adaptation Clearinghouse.

Seismic Hazards

Requirement Description:

The safety element must establish policies to minimize the loss of property and life as a result of earthquakes. The general geology and seismic history of the region and the planning area can be addressed with a map of known seismic and geologic hazards. The element should determine the location of active fault zones designated by the State Geologist under the Alquist-Priolo Earthquake Fault Zoning Act. Next, a geologic evaluation can evaluate the potential for displacement along active and potentially active faults in the planning area. Active and potentially active faults in the region should be identified with historical data on seismic ground shaking within the planning area. A geotechnical evaluation based on the state probabilistic earthquake hazard map can determine the potential for localized ground shaking, landslides, and tsunamis. Hazardous or substandard structures that may be subject to collapse in the event of an earthquake, including, but not limited to, unreinforced masonry buildings could be identified.

The geotechnical evaluation can also identify the potential for earthquake-triggered landslide, mudslide, liquefaction, and soil compaction. It should also determine the location of zones of required investigation for liquefaction. Areas that would be inundated in the event of a dam failure should also be identified. Dam inundation maps are available from the California Office of Emergency Services (OES). The development, facilities, and people potentially at risk in areas subject to potential inundation should be identified as well.

The safety element should include historical data on landslides and mudslides and identify areas that are landslide-prone by using, among other sources, landslide features maps, seismic hazard zone maps, and geology maps produced by Department of Conservation. The local potential for landslides and mudslides should also be identified in a geotechnical evaluation.

Historical data on land subsidence resulting from extraction of groundwater, natural gas, oil, and geothermal resources and from hydrocompaction can be used to identify areas of known risk from liquefaction, subsidence, or ground shaking. The potential risks associated with other known geologic hazards, such as volcanic activity, avalanche, or cliff erosion may also be analyzed.

Flood Protection

Requirement Description:

Flooding is a natural function of every river, alluvial fan, and coastal area. In riverine systems, floodwaters enrich bottomlands and provide spawning habitats for native fish. There are ecological benefits to maintaining connections between the river and its floodplain.

Land use decisions directly influence the function of floodplains and may either reduce or increase potential flood hazards. The functions of floodplains include, but are not limited to, water supply, water quality, flood and erosion control, and fish and wildlife habitat. Development within floodplains may not only expose people and property to floods, but also increase the potential for flooding elsewhere and negatively impact floodplain ecosystems. Land use regulations, such as zoning and subdivision ordinances,

are the primary means of implementing general plan policies established to minimize flood hazards. In addition to including floodplain management policies in the general plan, making related changes to zoning and subdivision ordinances is crucial to the success of a floodplain management program.

In the process of preparing a flood management element, the city or county will have to collect a substantial amount of information concerning its floodplains and its watershed. There are a variety of sources for this information. Federal Emergency Management Agency (FEMA) maps are available for most communities. The U.S. Army Corps of Engineers will do floodplain delineation on a cost-sharing basis and has information on floodplains and project levees. The Department of Water Resources (DWR) also has floodplain information and a floodplain management program, as does the Central Valley Flood Protection Board. The OES and DWR have information on past flooding and flood levels based on awareness mapping. Local levee districts and resource conservation districts may also have information to share.

The Central Valley Flood Protection Plan (adopted pursuant to SB 5, the Central Valley Flood Protection Act of 2008) aims to revamp insufficient levee, bypass, and other flood defense mechanisms to create a more integrated and hazard-averse flood management system. Carrying implications for Central Valley land use, conservation, and safety planning in floodplain zones, the 2012 Central Valley Flood Protection Plan (CVFPP) documents the condition of all of the region's state and federal flood management facilities and guides improvements to flood hazard prevention along the Sacramento River and San Joaquin Rivers. All cities and counties within the Sacramento-San Joaquin Valley were required to amend their general plans by July 2015 to contain the data and analysis in the Central Valley Flood Protection Plan and include goals, policies, and objectives based on that plan, as well as relevant implementation measures (Gov. Code § 65302.9).

Key Terms

Flood management is defined as the overarching term that encompasses both floodwater management and floodplain management.

Floodwater Management

Floodwater management includes actions to modify the natural flow of floodwaters to reduce losses to human resources and/or to protect benefits to natural resources associated with flooding. Examples of floodwater management actions include containing flows in reservoirs, dams, and natural basins; conveying flows via levees, channels, and natural corridors; managing flows through reservoir reoperation; and managing watersheds by decreasing rainfall runoff and providing headwater stream protection.

Floodplain Management

Floodplain management includes actions to the floodplain to reduce losses to human resources within the floodplain and/or to protect benefits to natural resources associated with flooding. Examples of floodplain management actions include minimizing impacts of flows (e.g., flood-proofing, insurance); maintaining or restoring natural floodplain processes (e.g., riparian restoration, meander corridors, etc.); removing obstacles within the floodplain voluntarily or with just compensation (e.g., relocating at-risk structures); keeping obstacles out of the floodplain (through subdivision and zoning decisions); education and emergency preparedness planning (e.g., emergency response plans, data collection, outreach, insurance requirements, etc.); and ensuring that operations of floodwater management systems are not compromised by activities in the floodplain.

Fire Hazards

Requirement Description:

There are many opportunities to address fire protection, fire prevention and hazard mitigation in the general plan, most obviously in the safety element which deals with all manner of natural and man-made hazards to life and property. California's increasing population and expansion of development into previously undeveloped areas is creating more "wildland-urban interface" with a corresponding risk of economic loss caused by wildland fire. The changing climate, specifically the rising temperatures and increasing temporal variability of water availability, continues to increase wildfire risk in many areas. Meanwhile, drought episodes with greater frequency and severity effectively lower fuel moisture conditions to create longer fire seasons, and combined with overstocked vegetation vulnerable to insects and diseases, produce an abundance of dead woody matter prime for intense burning.

Mitigating Hazards through Drought Resiliency Plans

The onset of severe droughts in California poses considerable threats to public safety and wellbeing by increasing fire hazard susceptibility and straining already scarce water resources. Drought's toll on crop yields, livestock production, and local community water sources create food and water security concerns, in addition to economic considerations, that showcase the importance of proper preparedness plans. Climate change will likely foster more consecutive disasters – for example, droughts followed by fires, or floods followed by drought – prolonging recovery of natural resources and compounding total recovery costs.

Government Code 65302(g):

(3) Upon the next revision of the housing element on or after January 1, 2014, the safety element shall be reviewed and updated as necessary to address the risk of fire for land classified as state responsibility areas, as defined in Section 4102 of the Public Resources Code, and land classified as very high fire hazard severity zones, as defined in Section 51177. This review shall consider the advice included in the Office of Planning and Research's most recent publication of "Fire Hazard Planning, General Technical Advice Series" and shall also include all of the following:

(A) Information regarding fire hazards, including, but not limited to, all of the following:

(i) Fire hazard severity zone maps available from the Department of Forestry and Fire Protection.

(ii) Any historical data on wildfires available from local agencies or a reference to where the data can be found.

(iii) Information about wildfire hazard areas that may be available from the United States Geological Survey.

(iv) General location and distribution of existing and planned uses of land in very high fire hazard severity zones and in state responsibility areas, including structures, roads, utilities, and essential public facilities. The location and distribution of planned uses of land shall not require defensible space compliance measures required by state law or local ordinance to occur on publicly owned lands or open space designations of homeowner associations

(v) Local, state, and federal agencies with responsibility for fire protection, including special districts and local office of emergency services.

(B) A set of goals, policies, and objectives based on the information identified pursuant to subparagraph (A) for the protection of the community from the unreasonable risk of wildfire.

(C) A set of feasible implementation measures designed to carry out the goals, policies, and objectives based on the information identified pursuant to subparagraph (B) including, but not limited to, all of the following:

(i) Avoiding or minimizing the wildfire hazards associated with new uses of land.

(ii) Locating, when feasible, new essential public facilities outside of high fire risk areas, including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in a state responsibility area or very high fire hazard severity zone.

(iii) Designing adequate infrastructure if a new development is located in a state responsibility area or in a very high fire hazard severity zone, including safe access for emergency response vehicles, visible street signs, and water supplies for structural fire suppression.

(iv) Working cooperatively with public agencies with responsibility for fire protection.

(D) If a city or county has adopted a fire safety plan or document separate from the general plan, an attachment of, or reference to, a city or county's adopted fire safety plan or document that fulfills commensurate goals and objectives and contains information required pursuant to this paragraph.

In response, many local governments are choosing to strengthen water management and drought prevention efforts by adding a separate water element to their general plan, but drought preparedness strategies could also be incorporated into the safety element as part of fire or flood hazard mitigation tactics. Structural and nonstructural flood management methods that enhance water storage and groundwater recharge work to mitigate drought impacts, and promoting greater water efficiency through land use and development policies can minimize capital damage from droughts as well as fires. As opposed to solely relying on local hazard mitigation plans, existing urban and agricultural water management plans, or expecting state or federal disaster aid after severe drought impacts, local governments can use the general plan as a tool to encourage water conservation policies, drought-tolerant parks and landscaping, water audits, and dual plumbing with recycled water. For more resources on how local governments can plan for droughts, see:

- California's 2010 State Drought Contingency Plan
- OPR's 2014 Local Government Drought Toolkit
- 2011 Climate Change Handbook for Regional Water Planning

- California's 2009 State Water Plan for integrated water management
- Local Government Commission's guidebook for regional water sustainability

Aside from local fire plans and hazard mitigation plans, the general plan's safety element can provide a framework for inserting fire protection and prevention policy requirements in zoning, subdivision, and strategic fire defense ordinances. To safeguard the increasing "wildland-urban interface," communities with State Responsibility Area (SRA) or Very High Fire Hazard Severity Zone Local Responsibility Area (LRA) must update their safety element following the next revision of the housing element on or after January 1, 2014 to address the risk of wildland fire. In order to develop viable plans for fire protection, wildfire risk reduction, evacuation needs, and consistency between general plan elements and other local plans, the safety element shall incorporate information such as fire hazard maps and assessments, implementation goals and actionable policies, as well as any appropriate references to local fire safety plans.

As a guiding resource, OPR's Fire Hazard Planning Technical Advisory includes a detailed discussion about how to incorporate and comply with the fire hazard requirements in a general plan.

Other Considerations

Additional Requirements

The safety element must also address additional, interrelated considerations in the context of fire and geological hazards. These include evacuation routes, military installations, peakload water supply requirements, and minimum road widths and clearances around structures. The relationships between these considerations interplays throughout the required contents of the safety element, and should be analyzed in the context of safety and disasters, including climate change, drought, fire, flood, or seismic activity, as appropriate.

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate. A full list of recommended policies for flood risk, fire risk, and climate change can be found in the guidance and technical advisories referenced throughout this chapter.

Sample Policy	Example of Application	Relationship to Other Elements
[City/county] shall promote the strengthening of planned utilities, the retrofit and rehabilitation of existing weak structures and lifeline utilities, and the relocation or strengthening of certain critical facilities to increase public safety and minimize potential damage from seismic and geologic hazards.	City of Rancho Cucamonga	Circulation, climate change, equitable and resilient communities
[City/county] shall site critical public facilities—including hospital and healthcare facilities, emergency shelters, police and fire stations, and emergency communications facilities—outside of the tsunami evacuation zone and 100-year flood plains.	Pacifica	Environmental justice, equitable and resilient communities, healthy communities
[City/county] shall identify and establish specific travel routes for the transport of hazardous materials and wastes, with key considerations being capacity to safely accommodate additional truck traffic, avoidance of residential areas, and use of interstate or state divided highways as preferred routes.	City of Rialto	Circulation, environmental justice, noise, healthy communities
[City/county] shall work to achieve consistency between general plan land use and related policies and the Airport Comprehensive Land Use Plan, as is appropriate for the community. Measures may include restrictions on permitted land uses and development criteria, including height restrictions.	Redwood City	Land use, circulation

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Note

The Environmental Justice Element section of the General Plan Guidelines has been updated.

The most recent version of this guidance may be found at: **opr.ca.gov/planning/general-plan/guidelines.html**

Return to element quick links

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Air Quality

Introduction

Chronic exposure to air pollutants is a serious health risk to millions of California residents, particularly the young, elderly, and people with heart disease and respiratory problems. Safeguarding public health has been the primary focus of federal and state air quality legislation and activities for many years. Air pollution also impacts local economies by damaging agricultural crops, natural vegetation, buildings, and other exposed materials. In addition, the economic health of an area may be affected adversely if insufficient air quality improvement triggers more stringent federally mandated air pollution controls. Air pollution also can impair visibility and obscure views. Cities and counties should strive to reduce emissions for the benefit of both their own residents and those of other communities in their region and the state as a whole. Air quality can be greatly improved through a multi-prong approach.

Local jurisdictions have responsibility for land use planning and can also significantly affect the design, creation, and management of development and the local circulation system. While air pollution is a regional issue, local governments have an opportunity to address air quality issues through general plans, development ordinances, local circulation systems, transportation services, and other plans and programs. As such, they are uniquely positioned to contribute to the local air district's efforts to achieve and maintain compliance with state and federal air quality standards. Supporting mode shift through improved bicycle and pedestrian facilities and support for transit, building infrastructure for zero emission vehicles, reducing parking, and promoting infill development can help reduce emissions and improve air quality. Cities and counties within the San Joaquin Valley Air Pollution Control District (SJVAPCD) jurisdiction are required by state law to include air quality measures in their general plans. The SJVAPCD developed the *Air Quality Guidelines for General Plans* to assist these cities and counties in meeting these requirements. The document provides additional goals, policies, and programs for adoption in general plans that will reduce vehicle miles traveled and improve air quality. In addition to statutory requirements for air quality measures in the San Joaquin Valley, cities and counties that have identified disadvantaged communities, as defined by SB 1000, must also incorporate air quality into their general plans. For more information on the environmental justice requirements, see the EJ section. Regardless of statutory requirements, the benefits of adopting an air quality element or implementing air quality policies throughout a general plan are universal.

Government Code 65302.1(c):

The adoption of air quality amendments to a general plan to comply with the requirements of subdivision (d) shall include all of the following:

(1) A report describing local air quality conditions including air quality monitoring data, emission inventories, lists of significant source categories, attainment status and designations, and applicable state and federal air quality plans and transportation plans.

CORRELATIONS AMONG ELEMENTS

	Land Use	Circulation	Housing	Conservation	OPen Space	Safety	Noise	EJ
Air Quality	RELATED	RELATED	RELATED	RELATED	RELATED	RELATED	-	IN STATUTE

■ Identified in statute ■ Closely related to statutory requirements

San Joaquin Valley Completeness Checklist

Statutory Citation	Brief Description of Requirement
§ 65302.1(c)(1)	Background report on local air quality conditions, including: • Air quality monitoring data, • Emission inventories, • Lists of significant source categories, • Attainment status and designations, and • Applicable state and federal air quality plans and transportation plans
§ 65302.1(c)(2)	Summary of government policies, programs, and regulations that may improve air quality, including • Local • District • State • Federal
§ 65302.1(c)(3)	Goals, Policies and Objectives, consistent with the following: • Mitigate project level and cumulative air quality impacts under CEQA • Integrate land use plans, transportation plans, and air quality plans. • Plan land uses in ways that support a multimodal transportation system (i.e., dense and compact). • Local action to support programs that reduce congestion and vehicle trips. • Plan land uses to minimize exposure to toxic air pollutant emissions from industrial and other sources. • Reduce particulate matter emissions from sources under local jurisdiction. • Support district and public utility programs to reduce emissions from energy consumption and area sources.
§ 65302.1(c)(4)	Feasible implementation tools
§ 65302.1(d)	Consider Air District comments on the draft plan

Required Contents in San Joaquin Valley

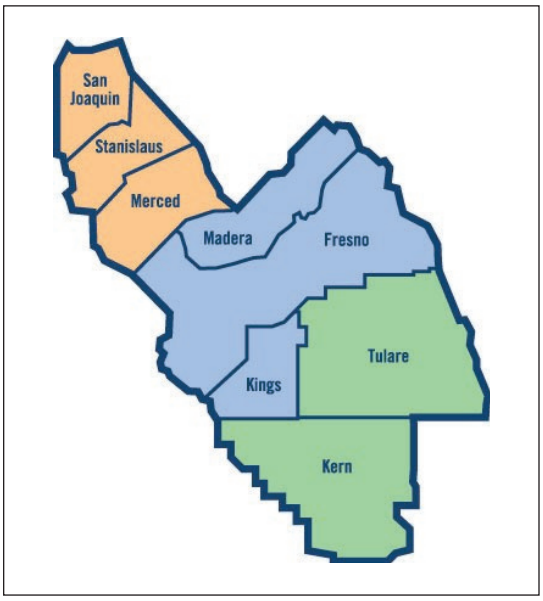
Pursuant to Government Code section 65302.1, the legislative body of each city and county within the jurisdictional boundaries of the San Joaquin Valley Air Pollution Control District (SJVAPCD) was required to amend the appropriate elements of its general plan, including, but not limited to, the required elements dealing with land use, circulation, housing, conservation, and open space, to include data and analysis, goals, policies, and objectives, and feasible implementation strategies to improve air quality.

4

The adoption of air quality amendments to a general plan includes all of the following:

- A report describing local air quality conditions including:
  - » Air quality monitoring data
  - » Emission inventories
  - » Lists of significant source categories
  - » Attainment status and designations
  - » Applicable state and federal air quality plans and transportation plans
- A summary of local, district, state, and federal policies, programs, and regulations that may improve air quality in the city or county.
- A comprehensive set of goals, policies, and objectives that may improve air quality.

San Joaquin Valley Air Pollution Control District Boundaries



A set of feasible implementation measures designed to carry out those goals, policies, and objectives.

Federal, State, Regional and Local Air Quality

Federal Air Quality Standards – The Federal Clean Air Act (CAA) requires the U. S. Environmental Protection Agency (U.S. EPA) to set and periodically review national air quality standards (NAAQS) for six air pollutants: carbon monoxide (CO), ozone (O3), particulate matter (currently in two size ranges: less than 10 microns in diameter, PM10; and less than 2.5 microns in diameter, PM2.5, also called fine particles), nitrogen oxides (NOX), sulfur oxides (SOX), and lead (Pb). Primary standards are based only on health considerations, and secondary standards also take into account welfare considerations. When U.S. EPA revises a NAAQS, states are required to attain the NAAQS by target dates specified in the CAA. A state's NAAQS attainment or non-attainment status is determined by U.S. EPA. States that do not attain the NAAQS are required to develop and implement air pollution control plans to achieve the NAAQS (state implementation plans, SIPs) by the target date. U.S. EPA provides guidance interpreting the SIP requirements in the CAA that the states must follow to develop an approvable SIP. If U.S. EPA deems a SIP is not approvable or if a state fails to develop a SIP, U.S. EPA can develop a Federal Implementation Plan that can be imposed on the state.

State Air Quality Standards – The California Air Resources Board (ARB) was established in 1968 to address air quality problems in California. Since formation of U.S. EPA in 1970, ARB has been designated as the State agency responsible for carrying out the State's responsibilities under the CAA. Because California was already regulating air quality before formation of U.S. EPA and passage of the CAA, California was granted several

privileges that are not allowed to any other state, including the unique authority to regulate mobile sources.

The California Clean Air Act (CCAA) also directs ARB to set state ambient air quality standards (CAAQS), as well as directing ARB to identify nonattainment areas of the State. In contrast to NAAQS, CAAQS do not have attainment date targets, however, areas that are nonattainment for the CAAQS must make annual progress to reduce air pollution levels. ARB monitors air quality statewide through an extensive monitoring network that is jointly operated with local air pollution control districts (APCDs) and air quality management districts (AQMDs). ARB also promulgates regulations that reduce air pollution emissions from motor vehicles and consumer products that improve air quality throughout the State. ARB has oversight responsibilities related to local air district activities.

Regional Air Quality Management –California is divided into geographic areas which share common airsheds, called air basins. Each part of California falls under the authority of a county air pollution control district (APCD) or a multi-county air quality management district (AQMD). These local districts have the main responsibility of controlling air pollution emissions from stationary sources within their jurisdictions, including sources such as factories, power plants, gas stations, and dry cleaners. The districts adopt and implement rules and regulations related to the stationary sources under their jurisdiction to reach ambient air quality standards in their air basin, and to enforce relevant State and federal laws.

Local Air Quality –Local government air quality responsibility includes four main areas: land use planning, review and mitigation of the environmental impacts of development projects, development and maintenance of transportation infrastructures; including transit systems, and implementation of local air quality programs.

At least 45 days prior to the adoption of air quality amendments to a general plan pursuant to this section, each city and county shall send a copy of its draft document to the SJVAPCD (Gov. Code § 65302.1(d)). The SJVAPCD may review the draft amendments to determine whether they may improve air quality consistent with the strategies. The legislative body of the city or county shall consider the district's comments and advice prior to the final adoption of air quality amendments to the general plan. The SJVAPCD's comments are advisory to the city or county

Statutory Requirements in San Joaquin Valley

The SJVUAPCD prepared the Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI), which can be found on the San Joaquin Valley Air Pollution Control District website. This document, GAMAQI 2015, which has undergone subsequent revisions to ensure its applicability over time, provides guidance for addressing air quality in environmental documents within the District. This includes methods of determining local air quality and suggested policies for improving air quality.

4

Considerations for Communities Beyond San Joaquin Valley

The general plan, as the foundation for local planning and development, can be an important tool for implementing policies and programs beneficial to air quality. Communities may choose to adopt a separate air quality element or to integrate air quality-beneficial objectives, policies, and strategies in other elements of the plan, such as the land use, circulation, conservation, and community design elements. Whichever method is selected, consistency among elements and policies within the plan is essential for successful implementation.

Required Contents for Disadvantaged Communities

Cities and counties whose general plan must include an environmental justice element, or related goals, policies, and objectives in other elements, must include ways to reduce the unique or compounded health risks in disadvantaged communities by reducing pollution exposure, including the improvement of air quality. For more information on disadvantaged communities and air quality requirements, see the environmental justice element section.

Communities with a Port of Entry

According to the Air Resources Board,

> "The diesel equipment operating in and around freight hubs, such as seaports, railyards, and warehouse and distribution centers, is a significant source of diesel [particulate matter] PM, a toxic air contaminant that can cause cancer and other health problems, including respiratory illnesses, increased risk of heart disease, and premature death. Exposure to diesel PM is a health hazard, particularly to children whose lungs are still developing and the elderly, who may have other serious health problems. The diesel PM emissions from freight operations impact communities located adjacent to those operations, as well as residents living miles away" (Sustainable Freight: Pathways to Zero and Near-Zero Emissions, 2015).

Port of entry communities may experience extensive exposure to air pollutants, and should have a comprehensive set of goals, policies, and objectives that can improve air quality. Sample policies may be found at the end of this chapter, and in greater detail in Appendix A.

Considerations in Land Uses Near High-Volume Roadways[4]

A general plan update is the opportune time to address issues that require thoughtful cross-sector analysis and discussion. Land use decisions near or adjacent to high volume roadways often present conflicts between economic, health, and environmental benefits from the development and the potential health impacts of vehicle emissions on nearby residents, businesses, schools, and other uses. Mitigating existing near-roadway land use conflicts and planning to avoid such conflicts in new projects requires coordination of several general plan elements, including land use, housing, circulation, environmental justice, and health.

Infill development along primary transportation corridors can help to achieve multiple policy objectives (good access to destinations, low VMT, environmental, heath, and economic benefits, fiscal savings for governments and transportation cost savings for citizens),

[4] High volume roadway is defined as: Roadways that, on an average day, have traffic in excess of 50,000 vehicles in a rural area and 100,000 vehicles in an urban area

but may also involve residential and commercial development adjacent to high-volume and other roadways elevated levels of air pollution or air toxics. Studies show that exposure to traffic pollution is associated with health issues including worsening of asthma and other respiratory health impacts. The foremost strategy for reducing pollution exposure near high-volume roadways is to minimize creation of traffic pollution in the first place. There are many efforts to do this:

- Federal and state emissions standards for cars, trucks, and buses
- State regulations for zero emission vehicle adoption
- SB 375, SB 743, regional, and local policies that reduce driving
- California's Sustainable Freight Transport Initiative
- Community- and government-led efforts to increase alternative transportation modes including public transit, biking, and walking

From a land use perspective, other strategies such as removing car lanes, having dedicated transit lanes, adding in separate bike lanes, and widening sidewalks are all practical strategies that can reduce emissions since they minimize traffic. Some areas have started Ciclavias, closing down a road for one day to cars to promote the use of the space by walkers, bikers, and other forms of activity.[xxvi] The land use and circulation sections discuss these options in more depth. Capping – by covering and building atop—or removing freeways is another strategy employed by some areas as appropriate.[xxvii] Eliminating the high frequency road altogether, and providing alternate modes of efficient transportation, as San Francisco did when removing the Embarcadero Freeway, may create co-benefits in the community, including increased health and economic vitality.

Some policies and regulations will go into effect in the next few years and will lead to substantial emissions reductions before development guided by current general plan updates will occur, while others have compliance dates that extend well into the future. Other policies, such as travel demand management, vary at the local level. Fleet turnover and changes in the built environment to increase non-auto travel will also take time. As these policies are realized, there is a need for local governments to consider other mitigation options to protect sensitive populations from near-roadway pollution exposure and to reduce the health impacts associated with living or working near busy roadways.

Deciding where to site a project is not a simple task. The pollutant levels and air quality near a freeway can vary significantly based on air-flow patterns, temperature, time of day, season, presence of sound barriers, vegetation, height of structures and other variables. The variation of near-roadway pollution levels means that development plans must consider reducing both peak and long-term pollution exposures. Cross-sector discussion and analysis are of utmost importance to determine adequate sites for future development and balance multiple policy objectives.

Research has begun to evaluate measures to avoid, minimize, and mitigate air pollution exposure near roadways. Simultaneously, new research shows health benefits from reducing GHGs; improving housing stock; preserving agricultural spaces, habitats, and recreational spaces; and engaging in the active transportation and mass transit made possible through infill development.

A comprehensive discussion around process strategies and mitigation strategies to address near roadway land use has the potential to improve air quality and reduce exposure to toxics. Furthermore, a holistic examination allows for weighing benefits related to

equity, health, economics, resource protection, and overall sustainability goals.

The Atlanta, Georgia Summer Olympic games of 1996 provides an example of a holistic approach to improve air quality through temporary mitigation strategies. Recognizing there would be an influx of people, Atlanta implemented a suite of policies to accommodate the additional visitors in a clean and travel efficient manner. These included a 24-hour public transit system, additional buses, modified work place policies such as telecommuting, and even adjustments to delivery schedules. Researchers were able to evaluate the impact of these short-term policies and showed decreased ozone, traffic counts, and acute care asthma visits. Although these were temporary measures, they reflect of what a more comprehensive suite of policy objectives could achieve through mode shift from car dependency to alternative forms of transit.

Just as in the Atlanta games example, the suite of strategies to address near roadway land use must be considered as it applies to the local context. Potential strategies to address near-roadway land use are identified below. Process strategies are listed to consider during the general plan update process. Additionally, mitigation strategies are identified for cases when they are needed. The mitigation measures listed are based on a review of the literature conducted by the Air Resources Board and published in the Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways.

Potential strategies to avoid and mitigate health impacts near roadways

Process Strategies

Aimed at identifying, mitigating, and avoiding—if possible—exposure to air pollution.

- Consult with regional air district during early stages of the general plan update when prioritizing areas for infill development to identify stationary and mobile sources of toxic air contaminants
- Consult with regional air district, community, and other stakeholders during identification of potential infill sites and create an inventory
- Engage with local community members early in the general plan update process to discuss vision, local priorities, and concerns
- Engage with local community groups working on related issues early in the general plan update

Infill development and active transportation create numerous co-benefits

Image by Urban Advantage, Dover Kohl & Partners

- Incorporate air pollution reduction goals and exposure reduction goals into the general plan language
- Prioritize discussion of policy goals that have the potential to reduce emissions overall to be incorporated into the general plan policy language, such as reduction of lanes in roads
- Prioritize discussion of policy goals that support mode shift from single occupancy vehicles to transit and/or active transit to be incorporated into the general plan policy language

Mitigation Strategies

Mitigation strategies are aimed at identifying various potential strategies that cities and counties can incorporate as needed to reduce exposure to near-roadway pollution.

Locating potential infill development sites near a high volume roadway may yield an array of benefits, which should be balanced with drawbacks associated with near roadway pollution. Additionally, many communities already have sensitive land uses near which can not be easily relocated, and thus need mitigation strategies to reduce health impacts. Research over the last decade has identified mitigation strategies that reduce pollution concentrations, emissions, or improve air flow. Site-specific factors should be carefully considered as local jurisdictions, in conjunction with their regional air district, assess and select mitigation strategies that make the most sense for the local context. Also, as illustrated with the 1996 Atlanta games example, a combination of mitigation strategies is likely to have a greater impact than implementing one stand-alone measure.

The research on mitigation measures tends to fall into one of several categories including:

1. Strategies to reduce traffic emissions
2. Strategies to increase dispersion of traffic pollution
3. Strategies to remove pollution from the air breathed by people

A full discussion of mitigation strategies and the background research is available in the Air Resources Board Technical Advisory: Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways. The table below is a high level summary of the description of the strategy, the research findings, and appropriate context and other considerations. Please consult the full publication for a more in-depth discussion.

Strategy	Description of research findings	Appropriate context & other considerations
I. Strategies that reduce traffic emissions		
1. Speed Reduction Mechanisms, including roundabouts	Vehicle speed reduction mechanisms change the design and operating speed of the road by altering the physical characteristics of the road. These features can reduce stop-and-go driving and hard accelerations and thereby reduce emissions rates. Some of these features, like the roundabout intersection, can be used as an alternative to stop-controlled and signalized intersections. Studies show that roundabouts can reduce localized pollutant concentrations compared to intersections with stop and signal control by 20% or more (depending on context and site-specific conditions).	Transportation planners and engineers should carefully consider the potential direct and indirect effects of implementing speed reduction mechanisms to determine if they will reduce vehicle emissions and other impacts to the environment as well as to traveler safety and delay. When guidance is needed to estimate emissions and air quality-related effects, planners and engineers may consult with MPOs or traffic modeling experts.
2. Traffic Signal Management	Traffic signal management systems can reduce stop-and-go driving and vehicle idling, resulting in reduced localized pollutant concentrations of up to 50% compared to corridors that do not implement these systems. Studies show that site-specific conditions dictate the magnitude of reductions.	Many different types of signal management are available, and planners should identify what is best for air quality, vulnerable road user safety, and transit and active mode throughput and comfort.
3. Speed limit reductions on high-speed roadways (>55 mph)	Research studies have identified an optimal average speed range of ~35-55 mph within which per-mile traffic emissions and fuel consumption are minimized. Generally, speed limit reductions on high-speed roadways can reduce tailpipe emission rates up to 30%, depending on the change in speed, the pollutant measured or modeled, and the roadway characteristics.	Speed limit reductions are appropriate on roadways where speed limit and design speeds exceed 55 mph.

Strategy	Description of research findings	Appropriate context & other considerations
II. Strategies that increase dispersion of traffic pollution		
4. Design that promotes ventilation along street corridors	The physical layout of urban streetscapes influences air flow and pollution movement. Research studies show that street corridors characterized by buildings with varying shapes and heights, building articulations (street frontage design elements like edges and corners that help break up building mass), and spaces that encourage air flow (e.g., parks) benefit from better pollutant dispersion and air quality. For example, buildings of varying heights can result in significant increases in turbulence (e.g., up to doubling), and adding bike lanes and sidewalks not only reduces car traffic, but also creates space for more dispersion (up to a 45% reduction in particulate concentrations).	Wider sidewalks, bicycle lanes, and other features benefitting pedestrians can also create space for better air flow and pollutant dispersion along with increasing active transportation and mode shift. This strategy should be considered in the context of the overall need to increase development density.
5. Solid barriers and walls	Measurement and modeling studies consistently find that solid barriers reduce near-road downwind concentrations by increasing vertical dispersion of pollutants emitted by vehicles. The magnitude of the reduction and its spatial extent depend on the height of the barrier, the width of the road, and micrometeorology. As reference, studies have consistently found that pollution concentrations downwind of the barrier, ranging from 10% to 50% reduction compared to concentrations measured on or directly adjacent to high-volume roadways.	Solid barriers should only be considered for installation along freeways, because they have the negative effect of dividing neighborhoods and obscuring sightlines.
6. Vegetation for pollutant dispersion	Studies indicate that vegetation has the potential to alter pollutant transport and dispersion. In some studies, specific locations and conditions translated to air quality benefits (e.g., pollution concentrations of up to 20% on the leeward side of the tree line). It should be noted that most studies were conducted on the East Coast and in Europe where vegetation types and densities differ from what is found in California.	Online tools are available to assist with the selection of appropriate vegetation considering allergen impacts, watering needs, and other factors. Maximum benefits have been shown to occur when vegetation is combined with solid barriers.
III. Strategies that remove pollution from the air breathed by people		
7. Indoor high efficiency filtration	Studies show that particle filtration systems and devices, specifically high-efficiency filtration with mechanical ventilation or portable high efficiency air cleaners, can be highly effective for reducing indoor pollution concentrations. High efficiency filters in ventilation systems can remove from 50-99% of particles in the air. However, research shows that filtration technologies for gaseous pollutants (VOCs) are variable in their effectiveness; some remove certain VOCs well, but not others.	Planners should be aware of current state and local building codes and their respective air filtration requirements, including requirements for amending code standards. Regular operation and maintenance is necessary for highest filter and ventilation efficiency, and is required by regulation in commercial buildings.

Near roadway siting considerations and strategies will continue to evolve. For example, vehicles will continue to become cleaner over the coming years, changing the balance in benefits and drawbacks of near roadway development. A general plan update provides a platform on which to consider multiple policy options simultaneously, and the opportunity to create holistic, internally consistent solutions.

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate. A full list of recommended policies can be found here.

Sample Policy	Example of Application	Relationship to Other Elements
[City, county] shall require that new multi-family residential buildings and other sensitive land uses in areas with high levels of localized air pollution be designed to achieve good indoor air quality through landscaping, ventilation systems, or other measures.	City of Murrieta	Land use, housing, healthy communities
[City, county] shall provide incentives to promote air pollution reductions, including incentives for developers who go above and beyond applicable requirements and mitigate pollution for facilities and operations that are not otherwise regulated.	City of Chula Vista	Land use, healthy communities, environmental justice
[City, county] shall require uses such as smog check stations, automotive painting and repair facilities conduct such activities in enclosed and filtered spaces to prevent odors and emissions from affecting passers-by, nearby residents, and building occupants	National City	Healthy communities, environmental justice
[City, county] shall employ strategies in the Community Design Element that reduce driving rates and improve air quality through land use and urban design will be implemented by the City and other responsible parties. These strategies include transit-oriented development, compact development, an appropriate mix of land uses, a jobs/housing balance, transit oriented development, and walkable streets.	City of Southgate	Circulation, land use, economic development, healthy communities
[City, county] shall minimize exposure to air pollution and hazardous substances	County of Ventura	Climate change, environmental justice, healthy communities
[City, county] shall encourage non-polluting industry and clean green technology companies to locate to the City.	City of Murrietta	Climate change, environmental justice, economic development, healthy communities