



# ENVIRONMENTAL CONSTRAINTS

The City of Sacramento is committed to the protection of life and property from the risks of natural and man-made hazards. A safe environment enhances residents' quality of life, contributes to a city's livability, and is important for attracting and retaining businesses that help to sustain a thriving economy. Additional policies that address response and disaster preparedness for potential environmental constraints can be found in PHS 4, Emergency Response and Disaster Preparedness.





# Seismic and Geologic Hazards

Policies in this section protect the public from seismic and geologic hazards by requiring enforcement of safety standards, state-of-the-art site design and construction methods, and mitigation to minimize the impacts of new development. These policies also require that emergency and post-disaster response plans be regularly updated and implemented to ensure the continued safety of Sacramentans.

## GOAL EC 1.1

**Hazards Risk Reduction.** Protect lives and property from seismic and geologic hazards and adverse soil conditions.

### Policies

- EC 1.1.1**      **Review Standards.** The City shall regularly review and enforce all seismic and geologic safety standards and require the use of best management practices (BMPs) in site design and building construction methods. *(RDR)*
- EC 1.1.2**      **Geotechnical Investigations.** The City shall require geotechnical investigations to determine the potential for ground rupture, ground-shaking, and liquefaction due to seismic events, as well as expansive soils and subsidence problems on sites where these hazards are potentially present. *(RDR)*

*See PHS 4, Emergency Response and Disaster Preparedness, for additional policies addressing emergency response and disaster preparedness for potential environmental constraints.*



*See LU 8, Public/Quasi-Public and Special Uses, PHS1, Police Service; and PHS 2, Fire Services, for additional policies addressing critical facilities.*







# Flooding Hazards

Policies in this section protect Sacramento residents by requiring maintenance of existing natural channel floodplain storage areas and by supporting the Sacramento Area Flood Control Agency (SAFCA) in implementing projects that will ultimately provide a 200-year level of flood protection or greater. New development will be evaluated for potential flood hazards prior to approval and will be set back a minimum distance from levees to minimize flooding risk and to allow for future modifications of the system. Flooding evacuation and rescue maps will be updated regularly. In addition, flooding hazard policies provide for protection from dam failure.

The General Plan Background Report provides the Flood Insurance Rate Map (FIRM), which shows the Federal Emergency Management Agency (FEMA) flood zones, for the city of Sacramento and the definition of each flood zone. The City also maintains a Floodplain Management Ordinance (Ordinance 2011-046).



*H Street Bridge during the 1986 flood event.*

*Photograph courtesy of Sacramento Area Flood Control Agency*

## GOAL EC 2.1

**Flood Protection.** Protect life and property from flooding.

### Policies

**EC 2.1.1 Interagency Flood Management.** The City shall work with local, regional, State, and Federal agencies to maintain an adequate information base, prepare risk assessments, and identify strategies to mitigate flooding impacts. *(MPSP/IGC)*

*See U4, Stormwater Drainage, for additional policies addressing flood control measures.*



*Landside toe of the levee along the American River.*



Improvements to levee infrastructure.

Photograph courtesy of Sacramento Area Flood Control Agency

- EC 2.1.2**      **Regional Flood Management Planning Efforts.** The City shall participate in the California Department of Water Resources (DWR) Regional Flood Management Planning effort for the Lower Sacramento/Delta North region. *(IGC)*
- EC 2.1.3**      **Interagency Levee Management.** The City shall work with local, regional, State, and Federal agencies to ensure new and existing levees are adequate in providing flood protection. *(IGC)*
- EC 2.1.4**      **200-year Flood Protection.** The City shall work with local, regional, State, and Federal agencies to achieve by 2025 at least 200-year flood protection for all areas of the city. *(RDR, MPSP)*
- EC 2.1.5**      **Funding for 200-year Flood Protection.** The City shall continue to cooperate with local, regional, State, and Federal agencies in securing funding to obtain the maximum level of flood protection that is practical, with a minimum goal of achieving at least 200-year flood protection as quickly as possible. *(FB/IGC)*
- EC 2.1.6**      **Floodplain Capacity.** The City shall preserve urban creeks and rivers to maintain existing floodplain capacity. *(IGC)*
- EC 2.1.7**      **Reservoir Storage Capacity.** The City shall partner with the Sacramento Area Flood Control Agency to advocate for reservoir management practices and reservoir improvements that will increase Sacramento’s level of flood protection. *(IGC)*
- EC 2.1.8**      **Floodplain Requirements.** The City shall regulate development within floodplains in accordance with State and Federal requirements and maintain the City’s eligibility under the National Flood Insurance Program. *(RDR)*
- EC 2.1.9**      **Community Rating System.** The City shall maintain eligibility in FEMA’s Community Rating System program, which gives property owners discounts on flood insurance. *(MPSP)*
- EC 2.1.10**     **Planned Land Use.** The City shall update, as necessary, the Land Use and Urban Form Element to reflect current floodplain mapping data. *(MPSP)*

**EC 2.1.11** **New Development.** The City shall require evaluation of potential flood hazards prior to approval of development projects and shall regulate development in urban and urbanizing areas per state law addressing 200-year level of flood protection. *(RDR)*

**EC 2.1.12** **New Development Design.** The City shall require new development located within a special (100-year) flood hazard area to be designed to minimize the risk of damage in the event of a flood. *(RDR)*

**EC 2.1.13** **Levee Certification.** The City shall work with SAFCA to achieve by 2025 local-certification of levees for 200-year flood protection. *(IGC)*

**EC 2.1.14** **Levee and Floodway Encroachment Permit.** The City shall require applicants to secure an encroachment permit from the Central Valley Flood Protection Board for any project that falls within the jurisdiction regulated by the Board (e.g., levees, designated floodways). *(RDR)*

**EC 2.1.15** **Levee Setbacks for New Development.** The City shall require adequate setbacks from flood control levees consistent with local, regional, State, and Federal design and management standards. *(RDR/MPSP)*

**EC 2.1.16** **Levee Trees.** The City shall recognize the value of trees on levees for habitat and as carbon sinks and support Sacramento Area Flood Control Agency efforts to develop a levee vegetation policy with the State and U.S. Army Corps of Engineers. *(MPSP/IGC)*

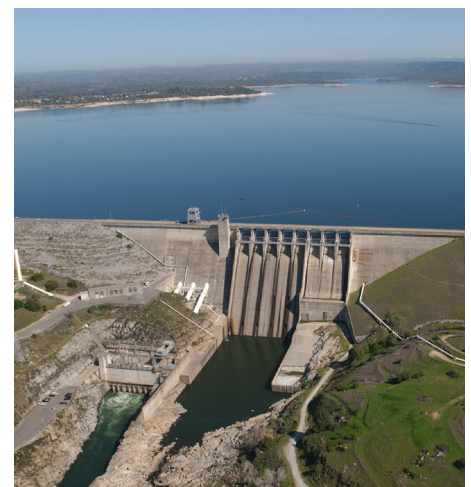
**EC 2.1.17** **Levees for Infill Development.** The City shall support the construction of levees that can increase levee stability and improve site characteristics, recreation, and river access where infill development and redevelopment occurs next to a levee. *(MPSP/IGC)*

**EC 2.1.18** **Design and Operation of Critical Facilities.** The City shall require that critical facilities (e.g., emergency command centers, communication facilities, fire and police stations) and large public assembly facilities be designed to mitigate potential flood risk to ensure operation during a flood event. The City shall encourage non-City critical facilities (e.g., schools and County, State, and Federal buildings) be designed in a similar fashion. *(RDR/SO/IGC/JP)*



*See LU 1, Growth and Change, for additional policies promoting infill development.*

*See U 4, Stormwater Drainage, for additional flood hazard policies addressing requirements for new development.*



*Folsom Lake Reservoir and dam facility. Photograph courtesy of Sacramento Area Flood Control Agency*

*See LU 8, Public/Quasi-Public and Special Uses for additional policies addressing critical facilities.*



- EC 2.1.19**      **Levees Used to Access Developments.** The City shall prohibit new development from using levees as a primary access point. *(RDR)*
- EC 2.1.20**      **Roadway Systems as Escape Routes.** The City shall require that areas protected from flooding by levees be designed to provide multiple escape routes for residents and access for emergency services in the event of a levee or dam failure. *(RDR/MPSP)*
- EC 2.1.21**      **Unobstructed Access to Levees.** The City shall provide unobstructed access, whenever feasible, on City-owned land to levees for maintenance and emergencies and require setbacks and easements for access to levees from private property. *(RDR/IGC)*
- EC 2.1.22**      **Comprehensive Flood Management, Emergency, and Evacuation Plans.** The City shall maintain, implement, update, and make available to the public the local Comprehensive Flood Management Plan, Emergency Plans, and Evacuation Plans, which address emergency preparedness, evacuation, hazardous materials, protection of critical facilities, development guidelines, and flood insurance outreach to better protect citizens in the event of a major flood event. *(MPSP/IGC)*
- EC 2.1.23**      **Flooding Evacuation and Rescue Maps.** The City shall maintain, update, and make available to the public, as appropriate, current flood evacuation and rescue maps. *(MPSP)*
- EC 2.1.24**      **Flood Risk Notification.** The City shall annually notify owners of residential development protected from flooding by a levee and/or subject to inundation in the event of levee failure of the risk. *(PI)*
- EC 2.1.25**      **Deed Notification.** The City shall require, for areas protected by levees, all new developments to include a notice within the deed that the property is protected by flooding from a levee and that the property can be subject to flooding if the levee fails or is overwhelmed. *(RDR/PI)*
- EC 2.1.26**      **Flood Insurance.** The City shall encourage all residents to purchase flood insurance. *(PI)*



**EC 2.1.27**      **Climate Change-related Flood Risks** 🌍. The City shall continue to partner with relevant organizations and agencies when updating FEMA and California Department of Water Resources flood hazard maps and the City's Comprehensive Flood Management Plan and the County-wide Local Hazard Mitigation Plan to consider of the impacts of urbanization and climate change on long-term flood safety and long-term flood event probabilities. (IGC)



*Executive Airport in the South Area.*



# Noise

Policies in this section protect residents, businesses, and visitors from noise hazards by establishing exterior and interior noise standards. Higher exterior noise standards are allowed for residential infill projects and mixed-use developments, as long as the interior noise standard is maintained. Mixed-use projects will be required to mitigate for on-site noise sources to ensure compatibility of uses. These policies also require construction noise impacts to be mitigated and require the reduction of noise from vehicles and aircrafts to protect residents, businesses, and visitors.

Existing noise contours for major sources in Sacramento, which include motor vehicles on roadways, aircraft at Sacramento International Airport and Executive Airport, light rail and heavy rail are included in the Background Report. Future noise contours for roadways, based on projected development under the 2035 General Plan, are shown in Appendix C.



Photograph courtesy of Michael Zwahlen

## GOAL EC 3.1

**Noise Reduction.** Minimize noise impacts on human activity to ensure the health and safety of the community.

### Policies

**EC 3.1.1 Exterior Noise Standards.** The City shall require noise mitigation for all development where the projected exterior noise levels exceed those shown in Table EC 1, to the extent feasible. (RDR)

**Table EC 1 Exterior Noise Compatibility Standards for Various Land Uses**

<i>Land Use Type</i>	<i>Highest Level of Noise Exposure That Is Regarded as "Normally Acceptable"<sup>a</sup> (L<sub>dn</sub><sup>b</sup> or CNEL<sup>c</sup>)</i>
Residential—Low Density Single Family, Duplex, Mobile Homes	60 dBA <sup>d,e</sup>
Residential—Multi-family <sup>g</sup>	65 dBA
Urban Residential Infill <sup>h</sup> and Mixed-Use Projects <sup>ij</sup>	70 dBA
Transient Lodging—Motels, Hotels	65 dBA
Schools, Libraries, Churches, Hospitals, Nursing Homes	70 dBA
Auditoriums, Concert Halls, Amphitheaters	Mitigation based on site-specific study
Sports Arena, Outdoor Spectator Sports	Mitigation based on site-specific study
Playgrounds, Neighborhood Parks	70 dBA
Golf Courses, Riding Stables, Water Recreation, Cemeteries	75 dBA
Office Buildings—Business, Commercial and Professional	70 dBA
Industrial, Manufacturing, Utilities, Agriculture	75 dBA

SOURCE: Governor’s Office of Planning and Research, State of California General Plan Guidelines 2003, October 2003

a. As defined in the Guidelines, “Normally Acceptable” means that the “specified land use is satisfactory, based upon the assumption that any building involved is of normal conventional construction, without any special noise insulation requirements.”

b. Ldn or Day Night Average Level is an average 24-hour noise measurement that factors in day and night noise levels.

c. CNEL or Community Noise Equivalent Level measurements are a weighted average of sound levels gathered throughout a 24-hour period.

d. Applies to the primary open space area of a detached single-family home, duplex, or mobile home, which is typically the backyard or fenced side yard, as measured from the center of the primary open space area (not the property line). This standard does not apply to secondary open space areas, such as front yards, balconies, stoops, and porches.

e. dBA or A-weighted decibel scale is a measurement of noise levels.

f. The exterior noise standard for the residential area west of McClellan Airport known as McClellan Heights/Parker Homes is 65 dBA.

g. Applies to the primary open space areas of townhomes and multi-family apartments or condominiums (private rear yards for townhomes; common courtyards, roof gardens, or gathering spaces for multi-family developments). These standards shall not apply to balconies or small attached patios in multistoried multi-family structures.

h. With land use designations of Central Business District, Urban Neighborhood (Low, Medium, or High) Urban Center (Low or High), Urban Corridor (Low or High).

i. All mixed-use projects located anywhere in the City of Sacramento

j. See notes d and g above for definition of primary open space areas for single-family and multi-family developments.

**EC 3.1.2**

**Exterior Incremental Noise Standards.** The City shall require noise mitigation for all development that increases existing noise levels by more than the allowable increment shown in Table EC 2, to the extent feasible. (RDR)



**Table EC 2 Exterior Incremental Noise Impact Standards for Noise-Sensitive Uses (dBA)**

<i>Residences and buildings where people normally sleep<sup>a</sup></i>		<i>Institutional land uses with primarily daytime and evening uses<sup>b</sup></i>	
<i>Existing L<sub>dn</sub></i>	<i>Allowable Noise Increment</i>	<i>Existing Peak Hour L<sub>eq</sub></i>	<i>Allowable Noise Increment</i>
45	8	45	12
50	5	50	9
55	3	55	6
60	2	60	5
65	1	65	3
70	1	70	3
75	0	75	1
80	0	80	0

SOURCE: Federal Transit Administration, *Transit Noise Impact and Vibration Assessment*, May 2006

- a. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
- b. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material.

**EC 3.1.3 Interior Noise Standards.** The City shall require new development to include noise mitigation to assure acceptable interior noise levels appropriate to the land use type: 45 dBA Ldn (with windows closed) for residential, transient lodgings, hospitals, nursing homes and other uses where people normally sleep; and 45 dBA Leq (peak hour with windows closed) for office buildings and similar uses. (RDR)

**EC 3.1.4 Interior Noise Review for Multiple, Loud Short-Term Events.** In cases where new development is proposed in areas subject to frequent, high-noise events (such as aircraft over-flights, or train and truck pass-bys), the City shall evaluate substantiated noise impacts on any sensitive receptors from such events when considering whether to approve the development proposal, taking into account potential for sleep disturbance, undue annoyance, and interruption in conversation, to ensure that the proposed development is compatible within the context of its surroundings. (RDR)

**NOISE TERMINOLOGY**

**Community Noise Equivalent Level (CNEL).** An L<sub>dn</sub> with an additional 5 dBA “penalty” for the evening hours between 7:00 P.M. and 10:00 P.M. This is essentially a measure of ambient noise.

**Day-Night Average Noise Level (L<sub>dn</sub>).** A 24-hour average L<sub>eq</sub> with a 10 dBA “penalty” added to noise levels during the hours of 10:00 P.M. to 7:00 A.M. to account for increased sensitivity that people tend to have to nighttime noise. Because of this penalty, the L<sub>dn</sub> would always be higher than its corresponding 24-hour L<sub>eq</sub> (e.g., a constant 60 dBA noise over 24 hours would have a 60 dBA L<sub>eq</sub>, but a 66.4 dBA L<sub>dn</sub>).

**dBA.** Measurement unit for “a-weighted decibels,” which are commonly used for measuring environmental and industrial noise and the potential hearing damage associated noise health effects.

**Equivalent Energy Noise Level (L<sub>eq</sub>).** Constant noise level that would deliver the same acoustic energy to the ear of a listener as the actual time-varying noise would deliver over the same exposure time. No “penalties” are added to any noise levels during the exposure time; L<sub>eq</sub> would be the same regardless of the time of day during which the noise occurs.

**Sound Exposure Level or Single Event Level (SEL).** A descriptor used to characterize the severity of short-duration sound events. SEL is the time-averaged, constant intensity, A-weighted sound level over a one-second reference time that would produce the same sound exposure as the actual time-varying sound over the actual exposure time. In practice, SEL is usually applied in situations where there are multiple sound events, each one having its own characteristic SEL.

- EC 3.1.5** **Interior Vibration Standards.** The City shall require construction projects anticipated to generate a significant amount of vibration to ensure acceptable interior vibration levels at nearby residential and commercial uses based on the current City or Federal Transit Administration (FTA) criteria. (RDR)
- EC 3.1.6** **Effects of Vibration.** The City shall consider potential effects of vibration when reviewing new residential and commercial projects that are proposed in the vicinity of rail lines or light rail lines. (RDR)
- EC 3.1.7** **Vibration.** The City shall require an assessment of the damage potential of vibration-induced construction activities, highways, and rail lines in close proximity to historic buildings and archaeological sites and require all feasible measures be implemented to ensure no damage would occur. (RDR)
- EC 3.1.8** **Operational Noise.** The City shall require mixed-use, commercial, and industrial projects to mitigate operational noise impacts to adjoining sensitive uses when operational noise thresholds are exceeded. (RDR)
- EC 3.1.9** **Compatibility with Park and Recreation Uses.** The City shall limit the hours of operation of parks and active recreation areas in residential areas to minimize disturbance to residences. (RDR/SO)
- EC 3.1.10** **Construction Noise.** The City shall require development projects subject to discretionary approval to assess potential construction noise impacts on nearby sensitive uses and to minimize impacts on these uses, to the extent feasible. (RDR)
- EC 3.1.11** **Alternatives to Sound Walls.** The City shall encourage the use of design strategies and other noise reduction methods along transportation corridors in lieu of sound walls to mitigate noise impacts and enhance aesthetics. (RDR)

*See ERC 2, Parks and Recreation, for additional policies on parks and recreation.*



## GOAL EC 3.2

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**Airport Noise.** Minimize exposure to high noise levels in areas of the city affected by Mather, Executive, McClellan, and Sacramento International Airports.

### Policies

**EC 3.2.1**      **Land Use Compatibility.** The City shall restrict new residential development within the 65 dBA CNEL airport noise contour, or in accordance with plans prepared by the Airport Land Use Commission, and shall only approve noise-compatible land uses. *(RDR)*

*See LU 4, Neighborhoods, and M 4, Roadways, for additional policies on residential streets, connectivity, and roadways.*

**EC 3.2.2**      **Hazardous Noise Protection.** The City shall discourage outdoor activities or uses in areas outside the 70 dBA CNEL airport noise contour where people could be exposed to hazardous noise levels. *(RDR)*

*City of*  
**SACRAMENTO**

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