



# City of Santa Barbara California

## PLANNING COMMISSION STAFF REPORT

**REPORT DATE:** June 30, 2011  
**AGENDA DATE:** July 7, 2011  
**PROJECT:** Work Program for General Plan Safety Element Update  
**TO:** Planning Commission  
**FROM:** Planning Division, (805) 564-5470  
*John Ledbetter, Principal Planner*  
*Barbara Shelton, Project Planner/Environmental Analyst* *BPS*

### **I. PURPOSE OF MEETING**

This is a Planning Commission discussion item to review the scope of work and schedule for updating the General Plan Safety Element.

The City has received grant funding to update the Safety Element. The focus of the Safety Element update is the avoidance of hazards through incorporation of updated information on earthquake, wildfire, flooding, and other hazards, and policies for new development.

The Safety Element information and policies support project design, permitting, and environmental review processes for private development and public facilities. The hazards information is also useful for other ongoing City service operations, including public safety response and disaster preparedness.

### **II. BACKGROUND**

#### **A. General Plan Safety Element**

State law requires a Safety Element as a component of city General Plans. A Safety Element provides information and policies directed toward avoiding hazards from earthquakes, slope stability problems, other geologic and soil hazards, flooding, fire hazard, and seacliff retreat.

State requirements previously identified separate Seismic Safety and Safety Elements, which are now combined as a Safety Element with a seismic safety component.

Exhibit A provides a summary of State Government Code requirements for the content of a General Plan Safety Element.

#### **B. Current City Safety Element**

In 1979, the city of Santa Barbara adopted its combined Seismic Safety-Safety Element as part of the General Plan (referred to hereinafter as "Safety Element").

Exhibit B provides a listing of the current Safety Element goals, policies, and program recommendations.

The current Safety Element provides maps and descriptions of physical hazards, discusses means of reducing hazards, risk perception, and disaster preparedness activities, and identifies action recommendations for the following hazards:

- Earthquake Hazards (fault displacement, ground shaking, liquefaction, tsunamis and seiches (waves within enclosed water body such as a lake);
- Geologic and Soils Hazards (landslides, high groundwater, expansive soils, erosion)
- Safety-Related Hazards (seacliff retreat, fire hazard, flooding, dam inundation)

The Safety Element has not received a comprehensive update since its adoption in 1979. Updated hazards information has been generated over these years through other planning processes, but has not yet been incorporated into the Safety Element to replace outdated information.

Examples of more recent hazard information include updated Federal Emergency Management Agency (FEMA) floodplain maps; adoption of a City Wildland Fire Plan; updated City Master Environmental Assessment geology maps and guidelines (for seismic conditions, unstable geology and soils, seacliff retreat, etc.); and development of a Multi-Jurisdiction Local Hazard Mitigation Plan in coordination with the County of Santa Barbara. The *Plan Santa Barbara* Program Environmental Impact Report also provides updated safety-related information.

### **C. *Plan Santa Barbara* General Plan Update Process**

In the ongoing *Plan Santa Barbara* process to update the City General Plan, the draft General Plan document identifies policies to update aspects of the Safety Element, such as seacliff retreat rates. The updated Safety Element would be included in the Public Facilities and Safety Element of the reorganized General Plan. A comprehensive update of this Element was anticipated to occur in a subsequent phase of the General Plan update process; however, grant funding has become available to allow the City to proceed with this work now.

### **D. DRI Grant Funding to Update Safety Element**

Federal HUD Disaster Recovery Initiative Allocation (DRI) funding has been made available to jurisdictions impacted by the Gap and Tea Fire disasters through the California Department of Housing & Community Development (HCD) Community Development Block Grant Program. The purpose of the funding is to help the recovery of damaged communities, as well as to prevent or lessen damage in potential future disasters. City Council authorized a grant application and the City received an initial grant for update of its General Plan Safety Element (\$80,000), and for construction projects involving Sycamore Creek improvements and the San Pedro Creek sewer relocation (total \$1 million for the three projects).

HCD issued an amended DRI grant notification to increase the funding cap, and on May 10, 2011, City Council authorized an amended City application to increase grant funding to approximately \$3.4 million total for the three projects, including increasing the Safety Element funding to \$250,000. State notification of the results of this amended application is still pending.

**E. Relation of Safety Element to Other Plans**

City Local Coastal Plan (1981). The City LCP applies to the area of the City within approximately 1,000 feet along the coast, as well as a portion of the Airport property. The LCP includes the same hazard policy statements as are in the Safety Element. The updated Safety Element information and policies would need to be incorporated into the LCP with a Plan amendment approved by the City and California Coastal Commission.

City Wildland Fire Plan (2004). The Plan contains updated policies addressing classification of fire hazard areas; building codes; defensible space provisions; post-fire rehabilitation guidelines; evacuation; response times; high fire hazard area provisions; vegetation fuels management; and public education. This document would provide a primary source for updating the fire hazard portion of the Safety Element.

City Codes and Ordinances. The City Building Code contains specific provisions for construction to State earthquake standards, and to address other seismic, geologic, and soil conditions. The City Floodplain Ordinance provides specific provisions for building within designated 100-year floodplains. The City Fire Code provides specific requirements for building and vegetation to reduce fire hazard.

Multi-Jurisdiction Local Hazard Mitigation Plan (Pending 2011). The County of Santa Barbara is taking the lead in a cooperative effort with cities, State and Federal agencies, and local residents to prepare an updated Local Hazard Mitigation Plan (LHMP). The Plan is prepared under the Disaster Mitigation Plan of 2000 (Public Law 106-390) a federal law administered by the Federal Emergency Management Agency (FEMA) with the objective of improving pre-planning to avoid or reduce the effects of natural disasters. Adoption of a LHMP also qualifies a jurisdiction for post-disaster grant funding. Local Hazard Mitigation Plans address many of the same issues as are required in General Plan Safety Elements.

While California has long had General Plan Safety Element requirements for cities and counties, other States have not, and are now engaging in this type of pre-mitigation planning through the federal Local Hazard Mitigation Plan process.

The updated LHMP for Santa Barbara County will include vulnerability assessments and pre-mitigation actions for flooding, wildfire, earthquakes, tsunamis, landslides, coastal erosion, and dam failure.

City Climate Action Plan (Pending 2012). The portion of the Climate Plan that would address climate change adaptation (issues such as sea level rise, flood hazards, and seacliff retreat) will also have some overlap with the Safety Element.

Airport Land Use Plan. The Santa Barbara County Airport Land Use Plan, administered by the Santa Barbara County Association of Governments (SBCAG) identifies clear zones and approach zones surrounding the airport runways with restrictions on land uses and population density to protect people and property from aircraft accidents.

### III. SCOPE OF WORK

#### A. **Current Grant – Scope of Work**

The grant received enables an update of the Element using *existing* sources of information, and would not provide for new technical studies. The following outlines the scope of work authorized by City Council:

##### Wildland Fire and Urban Fire Hazards

- High fire hazard – updated map and hazard description
- Vegetation clearance and water requirements – updated guidelines
- Wildfire hazard along creeks – hazard description and policy/program
- Post-fire rebuilding – updated design guidance
- Climate change adaptation – add pre-planning information

*[Key Sources: City Wildland Fire Plan; PlanSB EIR, City Fire Code; City creeks report; County Local Hazard Management Plan; City Master Environmental Assessment]*

##### Flood Hazards

- Flood hazard zones – incorporate updated maps and hazard description
- Dam inundation area – update map and hazard description
- Flood hazard policies – add updated references for floodplain management regulations, and new policies from the pending *Plan Santa Barbara* General Plan process addressing storm water management and creekside development.
- Climate change adaptation – add pre-planning programs

*[Key Sources: FEMA regulations; Flood Insurance Rate maps; City MEA Maps; PlanSB EIR; City Floodplain Ordinance; Lauro Reservoir Environmental Assessment; Local Hazard Mitigation Plan]*

##### Earthquake Hazards

- Fault hazard zones, groundshaking hazards, liquefaction hazard; tsunami/seiche hazards – incorporate updated maps, hazard descriptions, and policies/programs.

*[Key Sources: City URS Master Environmental Assessment maps/report; PlanSB EIR; Local Hazard Mitigation Plan]*

##### Geological and Soil Hazards

- Geologic units, soil types, slope instability/landslide potential, seacliff retreat, depth to groundwater, erosive and expansive soil hazards, radon hazard – incorporate updated maps, hazard descriptions, and policies/programs
- Coastal erosion – update formula and policies for sea cliff retreat and slope stability
- Climate change adaptation – add pre-planning programs.

*[Key Sources: City URS MEA maps/report; PlanSB EIR; Sycamore Canyon slide information; Coastal Commission Regulations and Guidelines; Local Hazard Mitigation Plan]*

#### Hazardous Materials

- Hazardous materials use – incorporate current policy and regulation references, including City pesticide policies
- Household hazardous waste – incorporate new program for establishing additional hazardous materials disposal capacity (*PlanSB PS 8.1*)
- Contaminated sites – incorporate program to develop vapor barrier guidelines for development near previously contaminated sites (*PlanSB EIR RM Hz-2*)

*[Key Source References: Existing regulations; PlanSB EIR; Local Hazard Mitigation Plan; County Fire contaminated sites lists; City hazardous materials business plan locations; pesticide policies]*

#### Public Safety

- Aircraft hazards – incorporate current airport safety zones and regulatory policies
- Pipelines and other utilities – incorporate location and regulation information
- Electromagnetic fields (EMF) – incorporate current prudent avoidance policy (*PlanSB EIR RM Hz-1*)

*[Key Source References: Federal Aviation Administration regulations, Airport Land Use Plan; PlanSB EIR; Airport Facility Plan & EIR; Local Hazard Mitigation Plan; Master Environmental Assessment Maps]*

#### Emergency Preparedness

- Critical facilities – incorporate information from pending Local Hazard Mitigation Plan

*[Key Source References: City Emergency Operations Plan; Local Hazard Mitigation Plan]*

Exhibit C provides a survey of what other city Safety Elements included for optional hazard issues such as hazardous materials, EMF, aircraft safety hazards, and crime/defensible space.

### **B. Amended Grant Application – Expanded Scope of Work (Application Pending)**

If additional grant funds were forthcoming, it would allow for an augmented level of effort to include:

- Amendments to the Local Coastal Plan and other City planning documents, consistent with the updated Safety Element information and policies, and
- New analysis of hazards and disaster response/recovery information that would require technical consultant assistance. This would fill technical gaps in hazards information and pre-planning for disaster response. The expanded analysis would increase the usefulness of the updated Safety Element information for design and review of development proposals and public facilities, as well as for disaster response planning and disaster recovery.

The scope of work authorized by City Council and specified in the amended grant application would add the following studies if additional grant funds are received.

Wildland Fire and Urban Fire Hazards

- Foothill evacuation routes - pre-planning transportation analysis (consultant study)
- Operational safety areas - pre-planning for foothill fire-fighting (consultant study)

Earthquake Hazards

- Depth-to-groundwater – update maps and hazard descriptions (consultant study)
- Liquefaction hazard - update maps and hazard descriptions (consultant study)
- Coastal evacuation routes for tsunami response – pre-planning transportation analysis (consultant study)

Hazardous Materials

- Hazardous materials business plans – upgrade data base for emergency responders use (consultant study)
- Contaminated sites – develop vapor barrier guidelines for development near previously contaminated sites (consultant study)

**IV. TENTATIVE PROCESS AND SCHEDULE (Current Grant and Scope)**

July-Oct 2011	Planning Commission review of scope of work Professional services Request for Proposals process/ contracting Identify technical review approach
Nov 2011-Apr 2012	Initial consultation with State agencies Prepare draft Safety Element Update Environmental review determination
May-July 2012	Draft Element public and agency review period Planning Commission hearing
Aug-Sept 2012	Prepare Revised Draft Safety Element Update
Oct-Dec 2012	Planning Commission hearing and Recommendation City Council hearing(s) for updated Safety Element adoption

**Exhibits:**

- A. State Government Code Requirements for Safety Elements and GP Guidelines Suggestions
- B. Summary of Current 1979 City Safety Element Goals, Policies & Recommended Programs
- C. Survey of Hazard Topics included in Other City Safety Elements

- **SUMMARY OF CALIFORNIA GOVERNMENT CODE REQUIREMENTS FOR GENERAL PLAN SAFETY ELEMENTS**
- **GENERAL PLAN GUIDELINES SUGGESTIONS**

By Marysol Smith, Intern

## ***Government Code Section 65302 Requirements***

### **Content Requirements**

***A safety element for the protection of the community from unreasonable risks associated with:***

- Seismically-induced surface rupture, groundshaking, ground failure, tsunami and seiche, and dam failure
- Slope instability leading to mudslides and landslides
- Subsidence, liquefaction, and other seismic hazards and other geologic hazards
- Flooding
- Wildland and urban fires

***The safety element shall include:***

- Mapping of known seismic and other geologic hazards
- Evacuation routes
- Military installations
- Peakload water supply requirements
- Minimum road widths and clearances around structures (as relate to identified fire and geologic hazards)

***Identify information regarding flood hazards, including:***

- |  |  |
|--|--|
| • Flood Hazard Zones   | <i>Federal Emergency Mgmt Agency</i>           |
| • National Flood Insurance Program maps  | <i>Federal Emergency Mgmt Agency</i>           |
| • Information about flood hazards  | <i>US Army Corps of Engineers</i>              |
| • Dam failure inundation maps  | <i>CA Emergency Management Agency</i>          |
| • Awareness floodplain mapping program maps and 200-yr floodplain maps   | <i>CA Dept of Water Resources</i>              |
| • Historical data on flooding, including local maps of areas subject to flooding; areas vulnerable to flooding after wildfires; and sites repeatedly damaged by flooding |  |
| • Existing and planned development in flood hazard zones, including structures, utilities, roads, and essential public facilities  |  |
| • Other information related to flood hazards   | <i>District, emergency services, fed/state</i> |

***Establish comprehensive goals, policies & objectives for the protection of the community from the unreasonable risks of flooding, including:***

- Avoiding or minimizing the risks of flooding to new development.
- Evaluating whether new development should be located in flood hazard zones, and identifying construction methods or other methods to minimize damage.
- Maintaining structural and operational integrity of essential public facilities during flooding.
- Locating, when feasible, new essential public facilities outside of flood hazard zones, (hospitals, health care facilities, emergency shelters, fire stations, emergency command centers, emergency communications facilities) or identifying methods to minimize damage.
- Establishing cooperative working relationships among public agencies with responsibility for flood protection.

***Establish a set of feasible implementation measures designed to carry out the goals, policies and objectives established.***

**Process Provisions**

***Relation to Other Plans:***

- The city shall utilize as a source document any urban water management plan submitted to the city by a water agency.
- Upon each revision of the housing element, the planning agency shall review and, if necessary, revise the safety element to identify new information that was not available during the previous revision of the safety element.
- Cities that have flood plain management ordinances approved by FEMA that substantially comply with this section, or have equivalent provisions in their general plans, may use that information in the safety element to comply.
- 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.
- A city may adopt with its safety element a local hazard mitigation plan, which shall include the following elements called for in federal requirements:
  - Initial earthquake performance evaluation of public facilities that provide essential services, shelter, and critical government functions
  - Inventory of private facilities that are potentially hazardous
  - Plan to reduce potential risk from facilities in event of disaster

***Agency Reviews of Draft Safety Element:*** Prior to preparing or revising its safety element, each city shall consult with:

- California Geological Survey, Dept of Conservation (Submit draft element and technical studies 45 days prior to adoption)
- State Board of Forestry and Fire Protection and every local agency that provides fire protection to territory in the city, for city that contains a very high fire hazard severity zone or state responsibility areas (Submit draft element 90 days prior to adoption)
- California Emergency Management Agency

**General Plan Guidelines – Selected Suggestions for Safety Elements**  
(Governor's Office of Planning & Research, 2003)

**Overall purpose:**

The aim of the safety element is to reduce the potential risk of death, injuries, property damage, and economic and social dislocation resulting from fires, floods, earthquakes, landslides, and other hazards.

**Relation among General Plan elements:**

The safety element overlaps topics also mandated in the land use, conservation, and open space element.

**Additional locally relevant safety issues that may be included:**

- Airport land use
- Hazardous materials spills
- Emergency response
- Crime reduction (e.g. lighting & landscape design for safety and accident prevention; policies for park and open space usership, and homelessness issues)

**Safety Elements must identify hazards and hazard abatement provisions to guide local decisions related to:**

- Zoning
- Subdivisions, and
- Entitlement permits

**Safety Elements should contain the following:**

- General risk reduction strategies and policies supporting hazard mitigation measures
- Policies should address the identification of hazards and emergency response, as well as mitigation through avoidance of hazards by new projects and risk reduction in developed areas.

**Additional suggestions:**

- Communities may use the Safety Element as a vehicle for defining "acceptable risk" and the basis for determining level of necessary mitigation.
- Policies may address not only methods of minimizing risks, but also ways to minimize economic disruption & expedite recovery following disasters.



**1979 CITY OF SANTA BARBARA GENERAL PLAN SEISMIC SAFETY-SAFETY ELEMENT  
SUMMARY OF GOALS, POLICIES & RECOMMENDATIONS**

<b>STATEMENT OF GOALS AND PUBLIC POLICY</b>
<b>Goals</b>
The goals of the Seismic Safety and Safety Element provide a link between the identified problems and issues and the policies and implementation measures which follow. They provide basic guidelines for City decisions related to natural hazards and assets as they affect land use planning and development standards. The following are recommended major goals for adoption:
To protect life, property, and public well-being from seismic and other geologic hazards.
To reduce or avoid adverse economic, social, and environmental impacts caused by geologic conditions.
<b>Policy</b>
The specific policies listed below provide a general direction or more specific steps for achieving the stated goals through implementation and action programs. The following are recommended policy statements:
To maintain, revise (wherever necessary), and enforce existing standards and criteria to reduce or avoid all levels of seismic or other geologic risk.
To evaluate the compatibility of existing zoning as well as future land use allocation with known geologic risk zones, or those which may be identified in the future.
To recognize the need to provide greater safety for important or critical-use structures (such as hospitals, schools, public assembly facilities, dams, and utility corridors) through careful site selection, appropriately comprehensive site investigation, and enforcement of applicable codes and regulations.
To prohibit development of important or critical-use structures in any active or potentially active fault zones, unless no other more suitable site can be located, <u>and</u> the site is shown to be safe for the intended use.
To advocate improved seismic safety programs for schools and promote greater general public awareness of all types of geotechnical hazards.
To improve interjurisdictional cooperation and communication, especially in regard to seismic safety aspects related to dams and reservoirs, state highway and freeway structures, regional fault studies, legislative matters, and disaster response or emergency plans.
To advocate improved earthquake insurance programs.

### **Ground Displacement Recommendations**

1. Additional geologic studies should be performed on the Mesa, Mission Ridge, and Lavonia faults to determine whether these faults should be considered active and to define further the width of the fault zones. Until such studies are completed, individual studies prepared by an engineering geologist shall be made for all major new structures proposed on faults or in fault zones identified by this report.
2. Additional geologic investigations of the More Ranch fault should be conducted to determine the extent of the fault activity and determine its precise location.
3. The Mesa, Mission Ridge, and Lavonia faults shall be considered as potentially active, unless detailed seismic-geologic investigations confirm the contrary. All other faults shall be considered as potentially hazardous and subject to further geologic investigation prior to development.
4. A geologic investigation is recommended specifically for the vicinity of Sheffield Reservoir, to determine if a branch of the Mission Ridge fault trends through the reservoir or its abutments.
5. Santa Barbara should encourage the performance of regional and local geologic-seismic investigations by qualified federal and state agencies, universities, and private consultants.
6. Buildings shall not be allowed to be constructed over an identified active fault. Appropriate setback requirements shall be determined by a registered engineering geologist based upon the specific site conditions involved.

### **Ground Shaking Recommendations**

1. Given that the possibility for greater ground shaking potential exists in some areas (i.e., filled estero land) for larger structures, these areas should be given special consideration. Santa Barbara should encourage the performance of regional and local studies by qualified federal and state agencies such as the U. S. Geological Survey and the California Division of Mines and Geology, private research firms, and universities to more accurately determine the potential for increased ground shaking.
2. Specific seismic investigations shall be conducted by appropriate consultants (engineering geologist, geophysicist, structural engineer, etc.) for all public buildings, disaster response facilities, schools, etc., and any structure over three stories located in the filled estero or thicker alluvium areas as shown on the Seismic Hazards Map.
3. Investigate possibilities of obtaining comprehensive earthquake insurance for public and private residential, commercial, and industrial facilities.
4. Require the design and construction of utility systems and other facilities which need to remain operable after an earthquake to be able to resist strong ground shaking forces.
5. Design and install auxiliary equipment, facilities, and machinery which must remain operable after an earthquake to resist strong ground shaking forces.
6. Lateral bracing requirements for mobile homes should be improved to prevent the trailers from falling off their foundations.

### **Structural Hazards – Hazard Reduction Recommendations**

1. To reduce the risk associated with the use of existing older structures that do not conform to present day earthquake safety standards, a survey of high-density residential, commercial, and industrial structures should be conducted throughout the city. The survey should concentrate on the Downtown and Lower State Street areas as most of the hazardous buildings are likely to be located there. ... After a list of priorities for building rehabilitation has been established, the City should investigate and adopt an action plan to carry out the abatement of structural hazards. ...
2. The City Building Official should review the Uniform Building Code and make recommendations on seismic engineering requirements for new buildings and the modifications of existing structures. If found to be inadequate, the development of new code requirements should be considered.
3. The City's Land Use Element, Zoning Ordinance, Subdivision requirements, and Grading Ordinance should be reviewed and amended, where necessary, to incorporate seismic safety considerations. Procedures should be established for requiring geologic site investigations in areas of high hazard, particularly where critical facilities are involved.

### **Liquefaction Hazard Reduction Recommendations**

1. Future development should consider incorporating the "vibro' replacement" technique of construction utilized in the expansion of the City's sewage treatment facility. This process will create many small vertical drains in the soil, thus decreasing the pressure exerted on the water contained in the soil during an earthquake.
2. Removing the objectionable soil material and replacing it with well-compacted artificial fill under the supervision of a qualified solids engineer. An extensive dewatering or drainage system would have to be used in conjunction with the new fill materials if the water table is near the ground surface.

### **Liquefaction Recommendations**

1. Liquefaction evaluations and recommendations should be made by a qualified soils engineer for all new major or public structures located in high or conditional liquefaction potential areas (shown on the Liquefaction Hazard Map) whose failure could result in loss of life or high monetary loss.
2. A committee of independent registered engineering geologists should be formed to develop a framework and format for geologic reports which are prepared for areas of potential liquefaction.
3. Geologic reports which are prepared for areas of potential liquefaction and submitted for City review shall be sent out for review by an independent registered engineering geologist to determine their adequacy and completeness.

**Tsunami Recommendations**

1. Tsunami warning and evacuation procedures as outlined in the City of Santa Barbara Natural Disaster Plan will be periodically reviewed and amended to insure that it will facilitate the rapid and orderly evacuation of the hazard area in the case of an imminent tsunami.
2. Conduct simulated tsunami warning operations involving Police, Fire, Public Works, Harbormaster, Airport, and any other agency concerned with tsunami warning and evacuation. This will serve to effectively familiarize each agency with their specific duties and responsibilities, and to pinpoint inadequacies in the evacuation and warning procedures.
3. Amend and update as necessary the Disaster Contingency Plan for tsunamis to reflect any changes in warning and evacuation procedures that are found to be needed after conducting the simulations. Concerned agencies will then be made aware of any changes in their duties and responsibilities.
4. Familiarize the general public located in tsunami hazard areas with the nature and extent of the tsunami hazard and with warning and evacuation procedures. This may be done through mailings, news media, public service announcements, and adult education.
5. Develop a warning system to alert boat owners with boats in the harbor of an imminent tsunami so as to allow them to move their boats to open water.

**Seiche Recommendations**

1. To reduce the potential impact of seismically induced seiches, the seiche hazard should be considered in all development within areas near open bodies of water and the harbor.
2. Investigate and take appropriate action to mitigate any potential seiche hazard related to the Lauro Canyon Reservoir.

**Landslide Recommendations**

1. Any proposed development within areas of active and inactive landslides as shown on the Soil Creep and Expansive Soil Map shall be evaluated by a qualified soils engineer to determine the feasibility of safe development occurring without the risk of renewed movement. The soils report shall include recommendations for slope stability measures to be taken, if needed, for safe development to occur. This report will be subject to the approval of the Building Official.
2. Major grading operations undertaken in areas of active and inactive landslides shall be designed and supervised by a qualified soils engineer.
3. The Building Official should establish procedures whereby expert consultants shall make independent reviews of geologic reports in hazardous areas to assist him in determining adequacy of analysis and problem solutions.

**High Groundwater**

1. In areas where near surface groundwater is present or where historic high groundwater levels could return to their previous high levels, soils engineering and foundation studies shall be conducted to determine what engineering measures would best mitigate any potentially adverse impacts.

### **Expansive Soils/ Soil Creep**

1. Investigations by an engineering geologist and a soils engineer should be performed for all structures proposed in areas of active or high potential soil creep, as shown on the soil creep and expansive soil map.
2. A soils engineer should conduct investigations for all structures proposed in areas shown to have variable, moderate or highly expansive soils.

### **Erosion Recommendations**

1. Detailed grading plans with strict revegetation provisions shall be required for all sites of proposed structures in areas of active erosion or high erosion potential. If cuts greater than 4 feet in height are proposed, the grading plan should consider erosion control in areas with a conditional erosion potential.
2. Major construction projects in areas of active erosion or high erosion potential shall be required to implement erosion and sediment control procedures during the construction phase of the project.

### **Seacliff Retreat Recommendations**

1. New development on the top of the cliff shall be placed at such distance away from the edge of the cliff that normal rates of erosion and cliff material loss will not seriously affect the structure during its expected lifetime.

Using the following simplified formula, a preliminary seacliff setback line has been devised (Hoover, 1978): 
$$\text{Setback} = \frac{\text{height of the shale seacliff} + (\text{thickness of terrace})(2) + (8''/\text{yr})(75 \text{ yrs})}{\text{tangent of dip}}$$

This formula assumes that unsupported bedding planes are unstable, the average rate of seacliff retreat is eight inches per year, terrace deposit (soil material deposited on top of the shale) stabilizes at a 2(H):1(V), and the design life of the project is 75 years. This preliminary setback line is depicted on the seacliff maps.

This setback is only a preliminary line and must be verified on a site-specific investigation of the property in question by a registered geologist.

2. As discussed earlier in this section, the addition of water to the seacliff can significantly lower inherent cliff stability and cause a stable cliff to become unstable.
  - a. Erosion caused by rainwater collecting on the top of the seacliff and then running over the edge can be minimized by installing lateral or "French" drains to collect and control the water. The water can then be piped off the property and properly disposed of in storm sewers. New development shall be required to install some satisfactory means of removing water from the cliff top. Owners of existing structures should be encouraged to install their own drainage devices to protect their homes and property.
  - b. To prevent excess water from being applied to the top of the cliff for gardening purposes, the planting of lawns, gardens, etc., should be discouraged. Instead, a native vegetation that is drought resistant, and that has deep, strong root systems to aid in stabilizing the cliff material should be planted. A list of drought-resistant native vegetation is included in Appendix 6. Most of these plants will grow rapidly but are small or medium in size, so as not to obstruct views.

**Seacliff Retreat Recommendations (cont.)**

3. In an attempt to impede the cliff retreat process, programs to control or prohibit the following activities that can significantly alter the rates of seacliff erosion and retreat shall be implemented.
  - a. Improper Access - Improper access may be discouraged by providing existing, established official beach access routes with additional parking, improved access facilities, and publicizing their locations. The use of unmaintained, improvised access routes that have the potential or are creating a serious erosion problem should be discouraged. This could be done by posting informational signs at the top of cliff near the access route, describing the adverse effects that improper access can cause and where the nearest maintained access routes are located.
  - b. Loading - Development that will add adverse amounts of excessive weight to the top of the cliff (i.e., large structures, swimming pools, artificial fill, etc.) shall be discouraged.
  - c. Improper Vegetation - Where feasible, existing non-native vegetation that requires large amounts of water, such as ice plant and annual grass, shall be replaced with native vegetation.
  - d. Trash Disposal - The disposal of any material onto the face of the cliff, including brush clippings from landscape vegetation, shall be prohibited.
4. To protect seacliffs and the structures placed on them from erosion caused by wave action, retaining walls, sea walls, broken concrete or stone revetment, breakwaters, and groins are sometimes used. Before the construction of these or any other shoreline protection structure is allowed, the need and potential for adverse environmental impacts of the project shall be evaluated by appropriate engineers as designated by the Building Official.

**Fire Hazard Recommendations**

***Development Controls***

1. Require that all land development proposals in the High Fire Hazard Zones be accompanied by detailed plans for fire prevention and control measures, prepared in accordance with City regulations. These plans shall be received by the City Fire Chief, Building Official, and other appropriate agencies.
2. Average road grades for new development shall not exceed 16 percent in order to facilitate access by emergency vehicles.
3. Construct turnouts on roads in the High Fire Hazard Zones every 1,000 yards to improve firefighting.
4. Install approved fire hydrants at 500 foot intervals along roads.
5. Strictly enforce the special building provisions for fire safety and prevention in the High Fire Hazard Zones.
6. Encourage homeowners in High Fire Hazard Zones with low water pressure to install their own emergency water supplies for firefighting operations. This could be swimming pools, water storage tanks, or other acceptable facilities.

**Fire Hazard Recommendations (cont.)**

***Fuel Management Controls***

7. Encourage the U.S. Forest Service to put highest priority on fuel management programs in areas of their jurisdiction near the city limits.
8. Encourage and promote the planting of orchards on the margins of High Fire Hazard Zones as productive fuel breaks.
9. When feasible, comprehensive fuel management programs shall be instituted in High Fire Hazard Zones within the City.
10. Minimum brush clearance provisions in the High Fire Hazard Zones shall be strictly enforced. Where applicable, measures shall be taken to reduce the threat of spreading flames wherever fire-hazardous trees (eucalyptus, gum) are planted near structures
11. Review existing ordinances and amend if necessary to require new developments in High Fire Hazard Zones to use fire-resistant planting in landscape plans.

***Other***

12. Encourage and promote the planting of fire retardant plants throughout the High Fire Hazard Zones in the City.
13. Periodically review and, if necessary, revise the High Fire Hazard Zone Maps to reflect new data regarding vegetation age and density.
14. Review and amend the Circulation Element of the General Plan to insure that emergency access routes for new subdivisions are adequate to allow fire and other emergency service vehicles to gain access.

**Flooding Recommendations**

1. Establish and enforce adequate creek setbacks or buffer zones to protect new development from flood and erosion hazards.
2. Conduct "precise-alignment" studies along Mission and Arroyo Burro Creeks to determine the most efficient stream channel configuration and setback distances. Any improvements resulting from the studies should be reviewed as to consistency with the Conservation Element.
3. To assure the effectiveness and structural integrity of flood containment structures placed on private land, all such construction should be subject to the approval of the Santa Barbara County Flood Control District.
4. Encourage light intensity use in the floodway or floodway fringe with the requirement that such uses shall not impair the flood-carrying capacity of the stream.
5. Develop a program to require removal or methods to effectively tie down floatable objects (lumber, trailers, empty storage tanks, etc.) located on the 100-year floodplain.

## Disaster Preparedness Recommendations

The City's Disaster Plan should be reviewed using the information provided by this report. Particular consideration should be given to upgrading emergency communications and self-sufficiency within the City of Santa Barbara. This could involve, but not be limited to:

1. Periodic earthquake and natural disaster drills conducted by the City and coordinated on a regional basis in cooperation with all involved jurisdictions.
2. Community programs that train volunteers to assist police, fire, and civil defense personnel during and after a major disaster should be established.
3. All present City operated emergency facilities (i.e., first aid stations, communication facilities, etc.) should be reevaluated as to their possible effectiveness in terms of location and response capabilities.
4. A review should be conducted of all emergency communication centers with respect to the availability of emergency power facilities now and in the future.
5. All major utility and transportation agencies should review the Seismic Safety and Safety Elements for possible impact on their facilities, and should forward comments to the City.
6. The City should develop an information release program to familiarize the citizens of Santa Barbara with the Seismic Safety and Safety Elements.
7. School districts and agencies related to aged, handicapped and seismically susceptible industries should be encouraged to develop educational programs relative to seismic awareness. Appropriate private media for reaching different segments of the community (Spanish-speaking) should be established and presentations conducted. Builders and realtors in the City should be provided with the findings of this report.
8. The City's Disaster Plan should be reviewed and updated with respect to the transportation, handling and storage of hazardous materials; the location and potential hazards of nuclear facilities; liquid gas facilities; and other hazardous industrial facilities. Land uses adjacent to such facilities or major transportation corridors along which hazardous materials are shipped should be reviewed as to their compatibility and safety.

# SURVEY OF HAZARD TOPICS INCLUDED IN OTHER CITY SAFETY ELEMENTS

By Marysol Smith, Intern

Safety Elements from selected California jurisdictions were reviewed to compare which optional topics were included, with results shown in the chart below.

Cities were chosen by their similarity to Santa Barbara (such as coastal proximity, and vulnerability to similar hazards).

Jurisdiction	Yr. adopted/ yr. amended	Crime Safe Community Planning	Hazardous Materials			Airport Related Hazards	Dam Failure	Community Wellness & Health Hazards	Coastal Erosion	Urban Fire Hazards	Tsunami and/or Seiche	Other
			General	EMF	Oil Industry / Spills							
<i>SB's Safety Element</i>	1979											
Arcata	2000/2008											
Carlsbad	1994											
Carmel	2009											
Carpinteria	2003											
Carson	2004											Terrorism
Goleta	2006											Radon
Manhattan Beach	2003											Terrorism
Santa Cruz	2009											
Seaside	2004											
Thousand Oaks	1996											
Ventura	2005											

