Living Where the Earth Shakes

A History of the California Seismic Safety Commission

Presented in Observance of the 25th Anniversary of the Creation of the Commission -- 1975-2000

December 2000

Living Where the Earth Shakes

A History of the California Seismic Safety Commission

Twenty-five Years of Protecting Life and Property From Earthquake Threats in California

---

Prepared by
Kip Wiley

California Senate Office of Research
Elisabeth Kersten, Director

December 2000

SEISMIC SAFETY COMMISSION

December 2000

Commissioners

Donald O. Manning, Chairman

Daniel Shapiro, Vice Chairman

Andrew A. Adelman
Assemblywoman Elaine Alquist
Bruce R. Clark
Jeffrey Johnson
Stan Y. Moy
Patricia Snyder
William Gates, Alternate

Sen. Richard Alarcon
Jerry C. Chang
Scott R. Haggerty
Douglas O. Mochizuki
Ashok S. Patwardhan

Chris Modrzejewski, Alternate

Staff

Richard J. McCarthy, Executive Director

Karen Cogan
Carmen Marquez
Henry Sepulveda

Kathy Goodell
Henry Reyes
Fred Turner

Interns

Farrah D. Craig
Judy Deng

Kyshia Davis

Table of Contents

PREFACE

California Earthquakes, 1769-Present 1

EXECUTIVE SUMMARY 7

Chapter 1: EARLY SEISMIC-SAFETY PUBLIC POLICY, 1925-1933

The First Local Seismic-Safety Building Codes 9
The First State Involvement in Seismic Safety 9

Chapter 2: MODERN SEISMIC-SAFETY PUBLIC POLICY

The Beginnings of California Seismic-Safety Public Policy 12
The Legislature Begins to Focus on Seismic-Safety Public Policy 13
The 1971 San Fernando Valley Earthquake and Legislative Reaction 14

Chapter 3: CREATION OF THE SEISMIC SAFETY COMMISSION

Birth of the Commission, 1974 16
The Commission's Work Begins, 1975 17

Chapter 4: THE EARLY POLICY WORK

State-Owned Buildings and Independent Review, 1975-1978 19
Goals and Policies for Earthquake Safety, 1979-1980 23
Private-School Construction and Mobilehome Bracing, 1981-1982 26

Chapter 5: MATURING OF SEISMIC-SAFETY POLICY

Earthquake Recovery, Essential Buildings and
Unreinforced-Masonry Buildings, 1983-1988 28
The Loma Prieta Earthquake and Its Aftermath 33
Dam Safety, Tsunamis and the Northridge Earthquake, 1992-1996 41
California Earthquake Loss-Reduction Plan and Expanding
Seismic-Safety Policy Initiatives, 1996-2000 45

APPENDICES

Enacted Seismic-Safety Legislation – 1975-2000 53
Publications of the Seismic Safety Commission 85
Historic California Earthquakes and Resulting Significant Legislation 91
Executive Directors of the Seismic Safety Commission 94
Commissioners of the Seismic Safety Commission 95
Seismic Safety Commission Staff 97

Preface

California Earthquakes, 1769 – Present

Earthquakes have been fairly common in California's recorded history. From 1769 to 1994, major earthquakes registering between magnitude 6.3 and 8.3 were experienced in the state every 5.4 years on average. Here are brief descriptions of major quakes, damages and casualties, where known:

- ***In 1769, Orange County*** – The first strong earthquake that was recorded by Europeans occurred in the Los Angeles region. The Gaspar de Portola Expedition, in camp about 30 miles southeast of Los Angeles, recorded four violent shocks.

- ***December 1812, Orange County*** – Forty persons attending church at San Juan Capistrano were killed by a strong earthquake that destroyed the church. Many mission buildings were severely damaged at both San Juan Capistrano and at San Gabriel.

- ***January 1857, Fort Tejon*** – An earthquake near the fort threw down buildings and large trees.

- ***October 1868, Hayward*** – A strong earthquake occurred on the Hayward Fault. Some 30 persons were killed in the region. Damage was severe in San Francisco; many buildings were wrecked at Hayward and San Leandro. Until 1906, this shock was often referred to as "the great earthquake."

- ***March 1872, Owens Valley*** – An earthquake in the Sierra Nevada fault system killed 27 people at Lone Pine and destroyed 52 of 59 adobe houses. Near Owens Lake, numerous depressions formed among huge cracks in the earth. One area 200 to 300 feet wide sank 20 to 30 feet; several long, narrow ponds formed.

- ***April 1892, Vacaville*** – Nearly all brick structures were wrecked, and many frame buildings were damaged. There were similar damages at Winters and Dixon, two small towns nearby. Ground fissures were noted in the area.

- ***December 1899, Saboba*** – On Christmas Day six persons died and several were injured near San Jacinto by a strong shock. At nearby Hemet, nearly all brick buildings were severely damaged, with only two chimneys remaining upright.

- ***April 1906, San Francisco*** – At least 700 died in one of the greatest earthquakes ever to hit California. Damage was extensive and was increased perhaps tenfold by raging fires. Total damage was estimated at more than $500 million.

- ***June 1915, Imperial Valley*** – Two destructive shocks nearly one hour apart caused about $1 million worth of property damage. Six persons were killed and several injured by the second quake at Mexicali, located just inside the Mexican border.

- ***April 1918, San Jacinto*** – A shock on the San Jacinto Fault caused heavy damage at San Jacinto and Hemet. Only one new concrete and one frame building remained standing in the business section of San Jacinto; property loss was about $200,000. Dry earth was broken up, as though by a harrow. One auto was carried off the road by a slide; many area roads were blocked.

Santa Rosa City Hall in the aftermath of the great earthquake of 1906.

- ***June 1925, Santa Barbara*** – An offshore shock caused 13 deaths and $8 million in damage. On State Street, the principal business thoroughfare, few buildings escaped damage; several collapsed. One structure on marshy ground withstood the shaking well, but its foundation sank 19 feet. The shock occurred at 6:42 a.m., before many people had reported for work and when streets were uncrowded, reducing death and injury.

- ***November 1927, Lompoc*** – A shock wrecked chimneys at Lompoc, shifted a house on its foundation, and caused heavy earth and rockslides on steep slopes. Water spurted from the ground in places; sand craters formed.

- ***March 1933, Long Beach*** – In Long Beach, buildings collapsed, tanks fell through roofs, and houses displaced on foundations. School buildings were among those structures most generally and severely damaged. Property losses were estimated at $60 million and 115 lives were lost. The Long Beach Earthquake triggered major changes in state policies, including the Field Act for public schools and a requirement for permits to ensure that new buildings comply with earthquake codes.

- ***May 1940, El Centro*** – Nine people were killed and at Imperial, 80 percent of the buildings were damaged to some degree. In the business district of Brawley, all structures were damaged, and about 50 percent had to be condemned. Total damage has been estimated at about $6 million. The first strong-motion record was collected in this event and served as the primary basis for seismic standards for many decades.

- ***June 1941, Santa Barbara*** – The shaking from this quake was felt as far away as Mojave, Lake Arrowhead, and even San Diego. Several water mains were broken. Some walls cracked and fell. The tops of streetlights snapped off and goods were thrown from store shelves. Damage was estimated at $250,000.

- ***July 1952, Kern County*** – The towns of Tehachapi and Arvin were hit severely by the Kern County earthquake. Twelve persons died, many were injured, and $49 million property damage was sustained. Damage to well-designed structures was slight, but old and poorly built buildings were cracked, and

many collapsed. Reinforced tunnels with walls 18 inches thick near Bealville were cracked, twisted, and caved in; rails were shifted and bent into S-shaped curves. Near Caliente, reinforced concrete railroad tunnels were demolished. Many aftershocks occurred, three higher than a magnitude of 6.

- ***February 1971, San Fernando Valley*** – The quake hit early in the morning, before rush hour. Freeway overpasses collapsed. Fifty-eight deaths resulted from the earthquake, mostly in a newly constructed veteran's hospital. Over 2,500 hospital-treated injuries were reported. Property damage was estimated to be over $500 million. This prompted the passage of the Hospital Seismic Safety Act and the state's Strong Motion Instrumentation Program.

- ***February 1973, Point Mugu*** – This earthquake was responsible for at least five injuries and more than $1 million damage in the Point Mugu-Oxnard area. Large boulders fell onto Highway 1 at Point Mugu, partially blocking the road. Over 7,000 customers were without electricity for hours. Most damage reported was to windows, ceilings, plaster, chimneys and shelved goods, though structural damage and broken pipes were also reported.

- ***August 1975, Oroville*** – The Oroville Dam was damaged as were other structures throughout the City of Oroville.

- ***1978, Santa Barbara*** – Some 65 people sustained injuries and roughly $7 million in property damages occurred. Near Goleta, a freight train was derailed by the shock, several buildings were damaged, and there was minor damage to a bridge. One roof collapsed in Santa Barbara, some walls were cracked, and other minor damage was reported.

- ***August 1979, Gilroy/Hollister*** – This quake caused 16 injuries and extensive structural damage.

- ***October 1979, Imperial Valley*** – A magnitude 4 earthquake caused $30 million in damages and injured 91 people.

- ***January 1980, Livermore Valley and Mammoth Springs*** – A 5.8-magnitude shock and a 5.0 aftershock damaged structures at the Lawrence Livermore Laboratories.

- ***May 1983, Coalinga*** – At least $31 million in damages were reported, nearly 200 people were injured and approximately 1,000 were left homeless. Production in the surrounding oil fields was disrupted and downtown businesses were forced to relocate or close as a result of earthquake damage.

- ***April 1984, Morgan Hill*** – A 6.2-magnitude earthquake caused 27 injuries and $10 million in damage.

- ***October 1989, Loma Prieta*** – At least 62 people died. Although tragic, this number was remarkably low given the time – about 5 p.m. – and the size – magnitude 6.9 – of the earthquake. Most casualties were caused by the collapse of the Cypress Street freeway section. At least 3,700 people were reported injured and over 12,000 were displaced. More than 18,000 homes were damaged and 963 were destroyed. Over 2,500 other buildings were damaged and 147 destroyed. Damage and business interruption estimates were as high as $10 billion, with direct damage estimated at $6.8 billion. Since Loma Prieta, bridge retrofits have been a top priority for Caltrans and have involved more than $4 billion in expenditures.

- ***June 1992, Landers*** – A 7.3-magnitude earthquake shook the unpopulated area of the high desert east of Twenty-nine Palms in Southern California.

The California State University Northridge parking structure was built in the early 1990s and collapsed in the Northridge earthquake.

- ***January 1994, Northridge*** – Fifty-seven people died, nearly 9,000 were injured, and damage exceeded $20 billion.

- ***October 1999, Hector Mine*** - Los Angeles area residents were awakened at 2:45 a.m. by a shock originating in a sparsely settled part of the Mojave Desert. Twenty cars of an Amtrak train were derailed near Ludlow. Parts of Los Angeles were left without power or water. An oil main burst.

- ***September 2000, Napa Valley*** - Several injuries were reported and at least 5,000 structures were damaged, with 50 to 60 percent of downtown Napa businesses receiving some damage to contents.

Executive Summary

This *History of the California Seismic Safety Commission* was commissioned by Senator Richard Alarcón on the 25th anniversary of the Commission's creation.

California is in the forefront of seismic-safety public policy – not only in the United States but around the world. The Seismic Safety Commission is the only body that is solely constituted to advance earthquake safety. The commission was established in 1975 to advise the governor, Legislature, state and local public agencies, and the public about strategies to reduce earthquake risk. It is an independent agency whose 17 commissioners are chosen for their expertise and experience. Fifteen commissioners are appointed by the governor, and one each represents the Senate and Assembly.

According to the U.S. Geological Survey, there continues to be "over a 90 percent chance that at least one major earthquake will strike an urban area of California in the next 30 years." Two relatively recent earthquakes, Loma Prieta in 1989 and Northridge in 1994, together caused more than 100 deaths and more than $100 billion in reported damage and direct losses. The majority of California's population lives within 20 miles of major earthquake faults.

In the wake of past disasters have come periods of rapid advancement in seismic-safety public policy. The 1933 Long Beach earthquake raised public consciousness about the importance of building public schools that can withstand severe shaking – and resulted in the landmark Field Act to do so. The 1971 San Fernando Valley earthquake focused new attention on the importance of hospital and dam safety, and reconfirmed the need to make school buildings earthquake resistant.

The 1979 Gilroy/Hollister earthquake led to laws aimed at mitigating the hazards of unreinforced masonry buildings, better informing Californians about how to prepare for and respond to earthquakes, bracing the foundations of mobile homes and improving the safety of gas valves. The 1984 Morgan Hill

earthquake set the stage for increasing the earthquake resistance of essential buildings and determining that children in private schools need and deserve the same protections against temblors as those in public classrooms. The 1989 Loma Prieta earthquake led to massive retrofitting projects to help ensure the safety of the state's bridges. And the 1994 Northridge earthquake paved the way for improving the likelihood that still other types of vulnerable structures will not fail when the earth trembles – and that earthquake insurance can help in the aftermath.

The lives and property of Californians have been made safer from potentially devastating earthquakes because of measures passed by legislators and signed by governors that in many cases were put forward by the commission. The commission's advocacy of long-term seismic-safety policies follows three basic principles:

- Incremental advancement in public policy affecting the design, construction, and retrofit of California's structural environment.

- Continual advancement in earthquake education and science about earthquakes and techniques for mitigating their effects.

- Effective preparedness, immediate emergency response, and successful personal and economic recovery.

This paper highlights California's recorded earthquake history and the factors that led to development of the Seismic Safety Commission. It reviews the actions over the past 25 years of the commission and the state of California to keep public safety paramount in a land that will never stand still.

Chapter 1: Early Seismic-Safety Public Policy, 1925-1933

California's First Local Seismic-Safety Building Codes

The first local government to adopt a seismic-safety building code was the city of Santa Barbara, not long after it was rocked by a quake on June 29, 1925. In February 1926, the City Council agreed to require structures to be designed to resist horizontal forces inflicted by earthquakes or wind. The new code also required structures to be designed by accredited architects and thoroughly inspected during construction.

Prior to the Santa Barbara temblor, Bailey Willis, head of the Seismological Society of America, and two Stanford University engineering professors had drawn up an amendment to the Palo Alto city building code to require structures to be designed to withstand lateral acceleration. The amendment was submitted to the Palo Alto City Council two months after the Santa Barbara quake and adopted eight months later.

The First State Involvement in Seismic Safety

When, in 1906, a great earthquake devastated San Francisco and surrounding areas of central California, the public did not view the disaster as an indication of a continuing seismic hazard. However, after a milder earthquake struck Southern California in 1933, Californians reacted differently. Local and statewide building codes requiring earthquake-resistant construction were rapidly enacted. The public acknowledged that something had to be done about earthquake risks in the state.

Thus that 1933 Long Beach earthquake remains pivotal and historic. On March 10, 1933, a moderately strong earthquake struck just off the southern coast of Los Angeles County. It had the same intensity as a 1925 Santa Barbara earthquake, but occurred in a more densely populated region and produced considerably more damage. The quake caused 115 deaths and property estimated at $60 million, over $1.5 billion in today's dollars, primarily in Long Beach and adjoining suburbs of south Los Angeles. Fortunately schools were not in session when the temblor hit, but school buildings suffered a disproportionate amount of damage. All schools in Los Angeles were closed for one week to allow for structural inspections. Seventy schools were destroyed and 120 suffered major damage. In addition, 41 schools were deemed unsafe for occupancy and remained closed.

Jefferson High School after the 1933 Long Beach Earthquake.

The Los Angeles County Coroner's Office, aided by a jury, held an inquest into the deaths. It included "testimony concerning safe building construction, especially in public schools." The jury argued that moderate-sized earthquakes were bound to recur sooner or later and recommended that earthquake provisions of the Uniform Building Code be immediately adopted in Los Angeles County. Local governments in Southern California soon followed. The cities of Long Beach, Los Angeles, Santa Monica, Beverly Hills and Pasadena adopted similar building codes.

At the state level, Assemblyman Don Fields introduced legislation that gave the state the power to approve public school construction

plans, inspect ongoing construction, and inspect existing school buildings at the request of local school districts. The measure was enacted and became known as the Field Act, still a landmark in the California codes. *It was the first time the state acknowledged that public steps should be taken to protect its citizens from earthquake hazards.*

Shortly after the introduction of Field's legislation, Assemblyman Riley of Long Beach introduced legislation that eventually would require most buildings in the state be designed to withstand horizontal forces. Enforcement was left to local building inspection departments, which were greatly understaffed. Many building departments initially failed to enforce what became known as the Riley Act, but eventually its enforcement became standard practice.

Why did state and local governments begin to act on seismic hazards only after the 1933 Long Beach earthquake? Surely the extensive damage to school buildings was one factor, likely viewed by many as a wake-up call. Carl-Henry Geschwind cites other factors, too, arguing in his 1996 doctoral dissertation that "after 1906, a small number of scientists and engineers developed a new interpretive framework for understanding earthquake risks in California, and these scientists and engineers gradually acquired the means that allowed them to prevail with their interpretation after the 1933 earthquake." He also argues that hazards and their implications for society are never obvious, but rather subject to interpretation and debate and that the "occurrence of natural disasters profoundly affects the persuasiveness of opposing interpretations of risk."

The response to the Long Beach earthquake marked a significant change in Californians' public attitude toward earthquakes. As Geschwind also observed, "For the first time, a large number of influential newspapers and public officials accepted the contention of seismologists and engineers that Californians needed to guard themselves against seismic hazards."

Chapter 2: Modern Seismic-Safety Public Policy

The Beginnings of California Seismic-Safety Public Policy

A devastating Alaskan earthquake in 1964 forever forged in Stanley Scott an interest in creating public policies that might protect human life and property. A seismic-safety policy analyst with the Institute of Governmental Studies at the University of California, Berkeley, Scott joined geologists and seismologists at the Jack Tar Hotel in San Francisco to review the implications of the Alaskan earthquake for California.

Of several hundred who attended that conference, only two guests, aside from Scott, represented public-policy interests. Concerned that the public safety of Californians wouldn't be adequately addressed in the quake's aftermath, Scott contacted Karl Steinbrugge, a professor in the School of Architecture at U.C. Berkeley and a member of the Earthquake Engineering Research Institute.

At Scott's request, Steinbrugge wrote a paper, published as a monograph by the U.C. Berkeley Institute of Governmental Studies in 1968, that suggested government could mitigate potential injuries and damage with forethought and action. Its focus was on addressing quakes in the San Francisco Bay Area.

At about the same time, Assemblyman Alfred E. Alquist was elected to the state Senate and hired Steve Larson as his administrative assistant. One of the Larson's duties was to examine the daily mail the senator received and determine which pieces should be forwarded to the senator, filed or thrown away. Larson, who had relatives who experienced the 1906 San Francisco earthquake and who had worked at the Winchester Mystery House,

which was damaged in that earthquake, saw the monograph in the mail pile. "It said that something could be done about earthquakes. I was just amazed about that," Larson recalled. He called Steinbrugge, who told him a dinner was planned at Berkeley's Faculty Club to discuss issues raised in the monograph and by a public-affairs article written by Scott calling for an earthquake policy commission, at least for the Bay Area. Twenty years later Scott would recount that Steinbrugge raised concerns about inviting a legislative staffer to the event, but later agreed that it might open an avenue to the Legislature. The dinner meeting ended with a strong consensus that something should be done in the area of seismic-safety public policy.

Upon returning from the Faculty Club dinner, Larson told Senator Alquist: "There are a lot of people there in the Bay Area, from the establishment, who are really interested in this problem. I think things can be done. You need to get together with some of these people." Alquist gave Larson carte blanche to explore the matter. Later that year Bob Olson, who would become one of the first commissioners on the Seismic Safety Commission and its first executive director, put together another conference at the Jack Tar Hotel in San Francisco. This time its title was *Geologic Hazards and Public Policy*.

The Legislature Begins to Focus on Seismic-Safety Public Policy

On April 8, 1969, Alquist introduced Senate Bill 1207 to establish a regional committee for seismic safety. The bill died without even passing out of its first policy committee. In June, Alquist introduced a Senate Concurrent Resolution (SCR 128), which sought to establish a joint committee of both the Senate and Assembly whose subject matter would be seismic safety. On August 8, the resolution was adopted and the Joint Committee on Seismic Safety was created for a four-year period. The joint committee was required to "develop seismic safety plans and policies and recommend to the Legislature any needed legislation to minimize the catastrophic effects upon the people, property, and the operation of our economy should a major earthquake strike any portion of the state of California."

The joint committee held its first hearing on November 26, 1969. On June 30, 1970, it released a progress report that noted an earthquake had killed 50,000 Peruvians and left 600,000 homeless

earlier that month. It also listed five advisory groups that had formed and been meeting monthly, and described the geologic and structural effects of a hypothetical moderate and great earthquake. The committee's Advisory Group on Engineering Considerations and Earthquake Sciences estimated that "a 'great' earthquake in California would cause over $30 billion in damages and result in inestimable loss of life."

The 1971 San Fernando Earthquake and Legislative Reaction

At 6:01 a.m. on February 9, 1971, an earthquake measuring magnitude 6.4 jolted the San Fernando Valley. Sixty-five deaths resulted from the earthquake and over 2,500 hospital-treated injuries were reported. Property damage was estimated at more than $500 million. All of a sudden earthquakes and related issues were big news. The joint committee, and its advisory committees, which had been meeting for over a year, seized the moment and drafted numerous pieces of seismic-safety legislation. Legislators were eager to introduce the measures. During 1971 and 1972 over 35 pieces of legislation were offered. The most notable of those enacted were:

- ***Seismic Safety General Plan Element*** – Required city and county general plans to include a seismic-safety element. (SB 351, Chapter 150, Statutes of 1971.)

- ***Strong-Motion Instrumentation Program*** – Required earthquake data-gathering instruments to be installed in large buildings and required the Division of Mines and Geology to monitor them. (SB 1374, Chapter 1152, Statutes of 1971.)

- ***Seismic Safety of the State Capitol*** – Requested the state architect to evaluate the safety of the historic west wing of the Capitol and to evaluate the costs of reconstruction to meet earthquake standards. (SCR 84, Resolution Chapter 233, Statutes of 1971.)

- ***Dam Safety Act*** – Required the Office of Emergency Services and public safety officials to order dam owners to prepare emergency evacuation plans and maps of areas that would be flooded in a dam break. (SB 896, Chapter 780, Statutes of 1972.)

- ***Hospital Seismic Safety Act of 1972*** – Required specific building standards for hospitals and created an advisory Building Safety Board. (SB 519, Chapter 1130, Statutes of 1972.)

- ***Alquist-Priolo Earthquake Fault Zoning Act*** – Required the state geologist to prepare maps of areas along major fault traces and zones. (SB 520, Chapter 1354, Statutes of 1972.)

In January 1972, Governor Ronald Reagan established the Governor's Earthquake Council as the administration's reaction to the San Fernando Valley earthquake and to the work of the Legislature's Joint Committee on Seismic Safety. The council continued in existence until the Seismic Safety Commission was up and running in 1975.

Collapse of the Psychiatric Ward of the Olive View Hospital in 1971.

Chapter 3: Creation of the Seismic Safety Commission

Birth of the Commission, 1974

In early 1974, when both the Joint Committee on Seismic Safety and the Governor's Earthquake Council were preparing their final reports, both bodies recommended that the state create a seismic safety commission to provide consistent earthquake policy. The Joint Committee on Seismic Safety stated in its January 1974 final report, *Meeting the Earthquake Challenge*:

> *The state should establish the California Commission on Seismic Safety with responsibility and authority to develop seismic safety goals and programs, help evaluate and integrate the work of state and local agencies concerned with earthquake safety, and see that the programs are carried out effectively and the objectives accomplished.*

In February of that year, Senator Alquist introduced Senate Bill 1729 to establish the Seismic Safety Commission. The initial version of the bill created the commission in perpetuity, with 13 members, and transferred the strong-motion instrumentation program -- which measures the movement of buildings during earthquakes -- to the commission from the Division of Mines and Geology. During the next several months the transfer of the strong-motion instrumentation program was removed from the legislation, the commission membership increased to 17, and the commission's existence was first to expire or sunset in four years and later in two. The amended bill passed the Senate 20-3 and the Assembly 68-0. It was signed by Governor Reagan in September.

The commission came into being on January 1, 1975. It had been expected that Governor Reagan would make the 15 appointments

required of the governor. But those appointments were not made until May 1975 – five months after the next governor, Jerry Brown, took office.

The main issue around the formation of the commission was whether it would be regulatory – and thus take power away from existing departments – or advisory. In addition, there were discussions over the membership of the commission. Should it be technical or general? In the end membership represented both the technical and general perspectives. At its first meeting, the commissioners chose one of the commission's members – Bob Olson – to become the commission's first executive director.

On August 1, 1975, a 5.7-magnitude earthquake struck, damaging the Oroville Dam and other structures around Oroville. The commission responded by launching what would become its standard procedure for investigating quakes and their effects. Several months later, Senator Alquist introduced legislation (SB 1340) to extend the 1976 sunset date of the commission by five years, to January 1, 1981. The bill also authorized legislative members to appoint alternates who could act on their behalf.

The Commission's Work Begins, 1975

In its early years the commission adopted administrative and procedural goals that would shape its activities for the rest of the century. These included:

- Emphasizing that the commission's main responsibility would be to advise, review and recommend.

- Developing work programs to accomplish specific tasks.

- Maintaining a high level of volunteerism by both commissioners and others.

- Encouraging nonmember participation through various committees chaired by commission members.

- Maintaining the commission's independence from the executive and legislative branches and other interest groups while working closely with them.

- Insisting that all policies and recommendations be adopted or implemented by an action of the full commission.

The commission carries out its work in many ways. It drafts, sponsors, provides testimony on and takes positions on measures before the Legislature. Since 1975 about 190 pieces of earthquake-related legislation, many sponsored by the commission, have become law.

In addition, the commission conducts studies on issues concerning seismic safety. It has created specialized committees of experts from the private and academic sectors along with representatives of state and local governments. The commission directs these committees to investigate specific policy areas and recommend changes. The commission also establishes and maintains relationships with boards, commissions, departments, agencies, and other public and private organizations to implement policies to improve seismic safety.

One of the commission's most important roles is that of independent review of quake-safety efforts and other seismic matters, which it has done largely through publication of 112 studies. These, in turn, frequently have led to legislation or formal hearings on seismic-safety issues. The commission's public hearings have cast light on safety concerns that otherwise might not have come to the attention of the state's policy-makers and the public. And, finally, the commission conducts post-earthquake investigations to learn from past seismic activity so it may propose policy solutions to prevent future hazards.

Chapter 4:
The Early Work Program

State-Owned Buildings and Independent Review, 1975 to 1978

At its second meeting on July 2, 1975, the commission created five task groups to research specific areas. The groups included:

- ***Field Act Modernization***, chaired by Arthur Mann;
- ***Hospital Act of 1973***, Review of Performance, chaired by Henry J. Degenkolb;
- ***Land Use Planning***, chaired by George Mader;
- ***Post-Earthquake Studies***, chaired by James Slosson;
- ***Hazardous Construction***, chaired by Louise Giersch.

During the 1975-1976 legislative session, the Legislature passed three notable bills that dealt with seismic safety:

- ***AB 387 (Davis)***, which established the Highway Emergency Fund to provide assistance to local jurisdictions for repair or replacement of highways damaged by earthquakes.
- ***AB 2122 (Maddy)***, which revised and codified the School Construction Inspection Program.
- ***SB 1950 (Alquist),*** which prohibited claims against the state for the accuracy or inaccuracy of earthquake predictions.

The commission had been operating for less than a year when, on February 6, 1976, Legislative Analyst William Hamm, in his review

of the governor's 1976-1977 proposed budget, recommended that the Seismic Safety Commission be eliminated. The legislative analyst considered the work of the commission duplicative of work done in other state agencies. At the time, Senator Alquist was a member of the Senate Finance Committee, which dealt with the state's annual budget. The legislative analyst's recommendation was never adopted.

In June 1976, the commission published its first report,[1] which developed a benefit-cost ratio, or formula for potential lives saved per dollar, for reconstruction to improve seismic safety. It recommended that this methodology be tested on buildings in the University of California system and that priority for reconstruction, or retrofitting, be given to buildings constructed prior to 1933.

LNG Facility on the Coast

The commission's second published report dealt with siting a liquefied natural gas (LNG) facility along the California coast. This was the beginning of the independent review process that the commission would later suggest for critical facilities. The commission found that it could not adequately assess the Point Conception LNG facility because "engineering and geologic/seismologic data has not been sufficiently developed." The commission recommended that the responsibility for siting and earthquake-resistant-design review be assigned quickly to a state agency, either the Public Utilities Commission or the Energy Commission.

In March 1977, the commission reviewed the use of a state-mandated seismic-safety element in local governments' general plans[2] and found that they had produced significant benefits but varied in consistency. The commission recommended that the state review the elements and provide models that local governments could follow. That action was followed by a report on how local governments were implementing the Special Studies Zones Act (now the Alquist-Priolo Geologic Hazards Zones Act). The staff

---

[1] *Report of Task Committee of the Seismic Safety Commission on Seismic Hazard from State-Owned Buildings.* (SSC 76-01.)

[2] *A Review of the Seismic Safety Element Requirement in California, March 25, 1977.* (SSC 77-01.)

report[3] produced 14 recommendations for changes in the act. Many of them were subsequently made.

Dam Safety

In June 1976, at the request of the commission, the state Office of Emergency Services (OES) determined that 1,121 of the 1,237 dams in the state were under state jurisdiction. While the state could review federal dam projects, it could not exercise any authority to supervise, approve or disapprove a federal project. That month the federally owned Teton Dam in Idaho collapsed – killing 11 people and causing an estimated $1 billion in damage. Concern over dam safety was growing.

Three months earlier, in March 1976, the Association of Engineering Geologists had written to the commission expressing concern over the safety of another federal project – the proposed Auburn Dam. The commission decided it would take a stand to require a more broad-based review process for the project, including an analysis of the seismic activity at the dam site and the actual design of the facility. The commission responded to the Association of Engineering Geologists that it "does not have the resources to conduct detailed engineering investigations. It does have, however, the responsibility to see that adequate efforts are made by others."

The commission monitored the design and review process, which included field studies on fault locations, age of faulting, and past occurrences of seismic activity. The commission reviewed the dam site in 1977 and issued a policy statement that urged the state and federal governments to develop a policy to jointly review the safety of all federal dams in California. Various state committees formed to investigate the seismicity of the dam site found that the Bureau of Reclamation design was not adequate to withstand an earthquake of the magnitude possible in the area. The secretary of the Interior accepted these findings and required that the dam be reauthorized by Congress. Congress has never reauthorized the Auburn Dam.

The commission also sought independent review for the Warm Springs Dam in Sonoma County. In 1978, the commission authorized its chair to take any steps necessary to delay the bid

---

[3] *Report on Local Government Implementation of the Special Study Zones Act, 1977. (Staff Report.)*

advertisement, including taking legal action. The commission was primarily concerned about the federal-state working relationship and the need for an independent review for this major facility. The Corps of Engineers stopped the bidding process and allowed the commission and state agencies time for review. The Corps of Engineers agreed to ensure adequate communications between state and federal authorities and a proper independent review of the design process. The process continued and the dam was completed in 1982.

In 1982 and 1983, the commission held hearings on dam safety. Projects that were sponsored by local governments or agencies but designed and built by federal authorities were considered federal projects and did not undergo state or independent review. As with the Auburn and Warm Springs dams, the commission sought to bring independent review to all such critical projects. Finally, in 1993, the Army Corp of Engineers agreed to permit personnel from the state's Safety of Dams Division to review the safety of federal dam projects.

The upstream face and crest of the Lower San Fernando Dam slid into the Lower Van Norman Reservoir in 1971, prompting the evacuation of 75,000-80,000 residents downstream.

Four notable measures dealing with seismic safety were enacted during the 1977-1978 session of the Legislature:

- ***SB 1081 (Alquist),*** which required the seismic design of a liquefied natural gas terminal to be addressed by the Public Utilities Commission.

- ***SB 1279 (Alquist***), which required the Seismic Safety Commission to conduct a study to determine the feasibility of establishing a comprehensive program of earthquake hazard reduction and earthquake prediction.

- ***SB 1367 (Alquist),*** which required registration of state construction inspectors.

- ***AJR 14 (Lehman)***, which requested that the president and Congress ensure that the Auburn Dam project would be seismically safe.

In early 1978, the commission obtained an attorney general's opinion that said structural engineers were immune from liability for service they rendered after an earthquake if they volunteered as disaster workers. In late 1978, after the August 13th Santa Barbara earthquake, the commission held hearings in Santa Barbara on the damage sustained by mobile homes. The results of the hearing led to the development of engineering criteria for mobile-home bracing devices. Legislation was enacted in 1982 to adopt these criteria.

In 1979, a California/Mexico Symposium on Seismic Safety of the International Border Region – an international meeting planned by the Commission – led to a continuing exchange among California, the United States and Mexico on seismic-safety issues. A mutual aid treaty was negotiated between the U.S. and Mexico.

Goals and Policies for Earthquake Safety, 1979-1980

In January 1979, Governor Jerry Brown released his proposed 1979-1980 budget, which did not provide any funds for the Seismic Safety Commission. The following month, Senator Alquist introduced legislation to make the commission permanent. At that time Senator Alquist was still a member of the Senate Finance Committee. During the negotiations on the state's budget it was agreed that the Seismic Safety Commission would continue – its sunset date was extended from 1981 to 1986.

The commission conducted two post-earthquake investigations in 1979 – the first near Gilroy in August; the second in November after a 6.6-magnitude Imperial Valley earthquake caused over 100 injuries and extensive structural damage. One of the major findings of the commission's Imperial Valley investigation was that vital emergency communications in California were vulnerable during a quake.

Also that year, the commission published *Goals and Policies for Earthquake Safety in California* (SSC 79-04), which has guided the yearly work programs of the commission. These cover:

- Planning and regulating land use;
- Improving building design and construction;
- Critical facilities and utility lifeline systems;
- Hazardous buildings;
- Improving earthquake preparedness and response capabilities;
- Guiding earthquake recovery;
- Promoting earthquake information, education and training;
- Financing seismic safety;
- Dealing with earthquake prediction; and
- Research needs for seismic safety.

During the same period, the 1979-1980 Legislature passed these seismic-safety measures:

- ***SB 445 (Alquist)***, which permitted local jurisdictions to lower building standards for the rehabilitation of pre-1933 buildings.

- ***AB 2202 (Vicencia)***, which changed the basic subject of the power of the Seismic Safety Commission to earthquake hazard mitigation. It also established the Southern California Earthquake Preparedness Project and appropriated $750,000 to the Seismic Safety Commission to develop an earthquake response plan for a portion of Southern California.

Originally AB 2202 sought to expand the authority of the Seismic Safety Commission to include oversight and policy development for all natural hazards. The bill would have renamed the commission the Seismic Safety and Emergency Preparedness Commission. Opposition came from other state agencies that stood to lose some of their authority. The bill in its final form created the Southern California Earthquake Preparedness Project, which was to work with local governments and private industry to stimulate

earthquake preparedness in a heavily populated five-county region of Southern California.

- ***AB 2438 (Wray)***, which authorized local governments to adopt ordinances requiring earthquake gas shut-off valves in buildings open to the public.

- ***ACR 96 (Perino)***, which requested the Seismic Safety Commission to study the problem of mobile-home bracing and make recommendations to the Department of Housing and Community Development for implementation.

On January 24, 1980, a 5.8-magnitude earthquake occurred 15 miles north of the Livermore Valley. Two days later there was a 5.0 aftershock. The quake damaged structures at the Lawrence Livermore Laboratories. On February 14, 1980, the commission met to discuss the damage at the laboratories, and approved a resolution urging the Livermore facilities to adopt retrofitting practices at least equal to those at laboratory facilities on the Berkeley campus. Soon after, the laboratories and the commission came to an agreement that the structural safety of critical buildings at the labs would be subject to independent review conforming to the commission's independent review policy.

Several months before the Livermore quake, the commission had published a report[4] concluding the "four last earthquakes in California have shown that mobile homes… are particularly vulnerable to earthquake damage." The commission noted that foundations were the most susceptible to trouble. The Livermore temblor highlighted a need for bracing devices on mobile homes since, as in other quakes, there was considerably more damage to mobile homes than wood-framed structures. The Legislature requested the commission to study the problem and make recommendations. The following year legislation was adopted that required bracing devices on mobile homes.

Also in 1980, a roof at Antioch High School collapsed without warning. In reviewing the collapse, the commission became concerned about potential hazards of pre-cast concrete structures. Early the following year, the commission published a report[5] finding that "there is a clear hazard from pre-cast, pre-stressed reinforced concrete construction." The commission recommended

---

[4] *Mobile Home and Earthquake Damage in California.* (SSC 79-07)
[5] *Report of the Precast Concrete Investigation Committee.* (SSC 81-03)

that all registered architects, civil engineers, and general contractors be contacted and requested to examine all relevant buildings they had worked on. The State Architect responded with a statewide investigation and retrofit program.

Private-School Construction and Mobilehome Bracing, 1981-1982

The effects of imposing stricter structural requirements on public schools in the aftermath of the 1933 Long Beach quake grew more noticeable over time, as public schools escaped relatively unscathed while neighboring structures suffered earthquake damages. The commission, however, remained concerned that the Field Act did not cover state universities or private schools. In 1981, the commission created a committee to study private-school construction. Three years later, the commission issued a report[6] that stated there were "no specific and uniform governmental codes related to earthquake mitigation for private schools." The commission recommended that students at public and private schools receive the same protections from quake hazards. It added that "many existing private school buildings may not meet minimum earthquake safety requirements… (and) indeed some such school buildings may be seismic safety hazards." It would take until 1987 before the Legislature adopted uniform building standards for private schools.

During the 1981-1982 session, the Legislature approved these measures dealing with seismic safety:

- ***SB 360 (Alquist)*** required mobilehome bracing devices. It also required the Department of Housing and Community Development to administer the program, test devices, and issue certifications.

- ***SB 843 (Alquist)*** appropriated $250,000 from the Environmental License Plate Fund for a contract with the Lawrence Hall of Science for a pilot earthquake education program in Los Angeles, Contra Costa and Alameda counties.

- ***SB 961 (Alquist)*** amended the Hospital Seismic Safety Act to require the Office of Statewide Health Planning and

---

[6] *Private Elementary and Secondary Schools and Earthquake Safety.* (SSC 84-01)

Development to institute nonstructural plan reviews and field inspections of hospital buildings being constructed to ensure building safety. It also required the state fire marshal to ensure fire safety of these buildings.

In March 1982, Bob Olson, the commission's first executive director, resigned. Richard Andrews was named the commission's second executive director in October 1983, but resigned one year later to accept a position in the Office of Emergency Services.

In late 1982, the Commission issued its *Earthquake Hazards Management: An Action Plan for California* (SSC 82-01). The report recommended a program of state expenditures of $721 million over five years for earthquake-safety improvements – an eight-fold increase. At the time the state was spending between $14 million and $18 million annually.

Chapter 5: Maturing of Seismic-Safety Policy

Earthquake Recovery, Essential Buildings and Unreinforced Masonry Buildings, 1983-1988

Car crushed by falling brick in the 1987 Whittier earthquake.

In May 1983, the Coalinga earthquake struck in southern Fresno County and caused at least $31 million in damage. Nearly 200 people were injured and approximately 1,000 left homeless. Production in the surrounding oil fields was disrupted and downtown businesses were forced to relocate or close as a result of earthquake damage. Coalinga was faced with rebuilding or repairing virtually the entire 12-square block downtown business district and replacing or repairing two-thirds of its housing.

The commission, in its post-earthquake investigation, introduced a new subject of investigation – recovery. The investigation report was written by Kathleen Tierney, who had a doctorate in sociology, bringing a new perspective to post-quake investigations. Two years later, when the commission issued its report,[7] it found that "Coalinga was not particularly well-prepared for the immediate emergency when the earthquake struck. Nor was it prepared to deal with the problems of rebuilding the community." Coalinga faced a series of challenges in the recovery period, including the demolition of damaged downtown structures that later led to controversy and lawsuits. There were other legal problems, dilemmas over how to finance long-term recovery (as opposed to earthquake-damage repairs), and controversies over the design of the new downtown business district.

Recovery aspects also were included in the commission's post-earthquake investigation of a Morgan Hill temblor less than a year later. The commission now was reporting on the following:

- Seismology and geology aspects of the earthquake.
- Effectiveness of early emergency responses.
- Observed casualties and damage patterns.
- Disaster relief.
- Programs and processes involved in long-term reconstruction.

The commission found that, in practice drills for earthquake emergencies, government agencies assumed that they would not be suffering problems themselves and that telephone service would operate normally.

In October 1983, the commission determined[8] that basic and applied research and policy studies should be incorporated into its work plan. The commission established a committee to set priorities for research, and communicated with congressional committees on the need for research into earthquake safety. Seven years later, the Legislature adopted SB 1835 (Alquist), ordering an Earthquake Research Evaluation Conference to be organized and managed by the Seismic Safety Commission. The conference would develop a strategy for earthquake research to identify the state's seismic-safety needs.

---

[7] *Report on the Coalinga Earthquake of May 2, 1983* (SSC 83-08).
[8] *The Commission's Role in Earthquake Research* (SSC 83-04).

During the 1983-1984 session, these seismic-safety measures were enacted:

- ***SB 612 (Alquist)*** allowed the Seismic Safety Commission to conduct a comprehensive investigation of the May 2, 1983, earthquake that devastated Coalinga, to publish a report on lessons learned for earthquake preparation and mitigation, and to make recommendations to the governor and the Legislature.

- ***SB 1782 (Alquist)*** deleted the sunset of the Seismic Safety Commission and continued the commission indefinitely.

- ***SB 1893 (Petris)*** enacted the California Earthquake Education Act of 1984 to establish a statewide project for earthquake-safety education and preparedness. It appropriated $525,000 to the Seismic Safety Commission for the project.

- ***AB 2662 (Alatorre)*** appropriated $750,000 to the Seismic Safety Commission and the Office of Emergency Services for comprehensive earthquake preparedness.

- ***AB 2865 (McAlister)*** required insurance companies to offer earthquake insurance.

In February 1985, Tom Tobin was appointed the third executive director of the commission. He served the longest as executive director – for 10 years, until September 1995.

A great 8.1-magnitude earthquake hit Mexico City on September 19, 1985. Thirty-six hours later, a 7.5 aftershock occurred. International agencies estimated that over 10,000 people died and 100,000 housing units were destroyed. The Mexican capital and surrounding areas sustained $4 billion in damage. Many "modern" buildings collapsed and had their floors fall onto one another or pancake. Images on television screens brought home the fact that large earthquakes can ravage "modern" buildings.

The commission moved ahead with programs to lessen the known hazards in unreinforced masonry buildings and identify other structural hazards. In its November 1985 report, *Earthquake Safety: Potentially Hazardous Buildings* (SSC 85-04), the commission called attention to some dangers that could be avoided by designing and building structures with adequate earthquake

resistance. The report found that there were structural problems with certain designs, including non-ductile concrete frames, pre-cast concrete, and soft-story buildings. Soft-story buildings – structures with minimal first-floor supports, often residences built over garages – were disproportionately represented in collapses during the Northridge earthquake of 1994.

SB 548 (Alquist) created the California Earthquake Hazard Reduction Act, which called for the commission to administer a program to "significantly reduce hazards by January 1, 2000."

Also in 1985, a confidential evaluation of the structural safety of 650 acute-care hospitals statewide was completed by the Applied Technology Council. It found an unacceptable number of hospitals did not meet the standards required in the Alquist Hospital Safety Act. New hospitals were built to these new standards but a large number of older hospitals remained at risk. It would take the commission nine more years to win successful legislation requiring the retrofitting or retirement of these vulnerable hospitals.

Perhaps one of the most important successes of the commission was the enactment of the Unreinforced Masonry Building Program, SB 547 (Alquist), in 1986. Unreinforced masonry buildings possess features that can threaten lives during earthquakes. These include unbraced parapets and walls and roofs that are not well attached to each other. When earthquakes occur, inadequate connections can allow masonry to fall and floors and roofs to collapse, leaving occupants and passersby in harm's way.

The commission pushed for the enactment of SB 547 (Alquist), which required local governments in highly seismic regions to begin identifying hazardous unreinforced masonry buildings. The bill also required local building officials to establish loss-reduction programs for such buildings under their jurisdiction by January 1, 1990. The bill was signed into law July 3, 1986.

The commission had previously identified the extreme hazards to life and safety associated with these buildings. In the early 1980s, only the cities of Long Beach, Santa Rosa, Sebastopal, Gardena, Huntington Beach, Santa Ana, Morgan Hill and Los Angeles had ordinances that allowed unreinforced masonry buildings to be retrofitted to resist earthquake forces to less than the standards of the current building code. The commission's report, *Rehabilitating Hazardous Masonry Buildings: A Draft Model Ordinance* (SSC 85-

06), said that "it is also well-established that unreinforced masonry buildings, being highly vulnerable to seismic forces, constitute one of the greatest threats to life safety in an earthquake." The report included a model ordinance that local governments could adopt or adapt. (See SSC94-04 for its latest version).

After seeing the damage caused by the Mexico City earthquake, Governor George Deukmejian agreed to signed SB 547. Since then, about half of an estimated 25,500 previously unreinforced masonry buildings near active faults in California have been retrofitted under the program created by the legislation. As of early 2000, about 96 percent of the buildings identified were located in urban areas, and about 4 percent were in counties .

During the 1985-1986 session, these measures dealing with seismic safety were enacted:

- ***SB 239 (L. Greene)*** created the Essential Services Building Act and declared the intent of the Legislature that essential services buildings be designed and constructed to a higher standard to resist damage from earthquakes. Established design and construction requirements.

- ***SB 547 (Alquist)*** created the Unreinforced Masonry Building Program affecting 286 local governments and over 25,000 buildings.

- ***SB 548 (Alquist)*** created the California Earthquake Hazard Reduction Act, which called for the commission to administer a program to "significantly reduce hazards by January 1, 2000."

- ***SB 1590 (Robbins)*** provided state funding for a new national research center for earthquake engineering. Unfortunately, California lost the federal competition for funds, which went to Buffalo, NY.

- ***AB 938 (Alatorre)*** required the Department of Conservation to develop a prototype earthquake-prediction system on the San Andreas Fault. Requires the Office of Emergency Services to develop a comprehensive emergency-response plan for short-term earthquake predictions.

- ***AB 3249 (Katz)*** required private schools constructed after July 1, 1987, to have plans that meet applicable code standards.

Required their plans to be reviewed by a structural engineer, and that the project's design professionals periodically review the construction.

In its role of advising the Division of Mines and Geology on the Strong Motion Instrumentation Program, the commission determined that the number of strong-motion instruments should be doubled. The commission felt that a wider range of structures should be instrumented to provide a better range of data for more types of structures. This recommendation led to the introduction of SB 593 (Morgan) in 1987, which eventually doubled the financial support for the program.

During the 1987-1988 session, these bills dealing with seismic issues were enacted:

- ***SB 593 (Morgan),*** which increased building permit fees to fund the Strong Motion Instrumentation Program.

- ***AB 1885 (Floyd),*** which required the Department of Insurance to study earthquake insurance and report to the Legislature.

Three months after the close of the 1988 session, the quake awareness of the Legislature and the governor was once again heightened, this time by the Armenian Earthquake in December of 1988. Thirty-one bills dealing with seismic-safety issues were introduced in the Legislature in 1989, all before the Loma Prieta quake struck in October. By October, the Legislature had adjourned for the year. But it quickly returned for a special session called by Governor George Deukmejian in the aftermath of the devastating coastal quake.

The Loma Prieta Earthquake and Its Aftermath, 1989-1990

At 5:04 p.m., Tuesday, October 17, 1989, as over 62,000 fans filled

Responding to a California at Risk

Of 31 quake-safety bills offered in early 1989, 20 addressed recommendations in *California at Risk*, a commission report described in this section. The commission sponsored eight of these bills. (Ultimately 21 of the 31 quake measures were signed by Governor Deukmejian.)

Facing his closing year as governor in 1990, Deukmejian crafted his own set of 11 major seismic-safety initiatives – drawing upon *California at Risk* for 10 of them.

Seventeen days after Deukmejian signed the last of the regular session bills of 1989, the Loma Prieta Earthquake occurred, triggering a round of special-session quake bills to respond to the tragedy.

Candlestick Park for the third game of the World Series, a 6.9-magnitude earthquake struck 60 miles south of San Francisco. Among the most catastrophic events were the collapse of an elevated section of Interstate 880 along Cypress Street in Oakland, the collapse of a section of the east span of the San Francisco-Oakland Bay Bridge, multiple building collapses and fires in San Francisco's Marina district, and the collapse of several structures in the cities of Santa Cruz and Watsonville. Damage and business interruption estimates reached as high as $10 billion, with direct damage estimated at $6.8 billion. Of that amount, $2 billion represented San Francisco alone. Santa Cruz officials estimated that damage to that county, which includes Watsonville, topped $1 billion. Areas outside of Santa Cruz County, including Hollister and Los Gatos, also suffered heavy damage. President Bush declared a disaster area for the seven hardest-hit counties, from Monterey and San Benito in the south to Marin and Solano in the north.

At least 62 people died. Although tragic, this number of casualties was remarkably low given the time and size of the earthquake. Most casualties were caused by the collapse of the Cypress Street freeway section. At least 3,700 people were reported injured and over 12,000 were displaced. More than 18,000 homes were damaged and 963 were destroyed. Over

A Record Number of Seismic Safety Bills

In January 1990, the commission, in cooperation with the Earthquake Engineering Research Institute, offered a seminar for legislative staff on important seismic-safety issues recommended for legislative consideration.

The seminar summarized many of the initiatives in *California at Risk*. In subsequent weeks, legislators introduced 307 seismic-related bills in the Assembly and Senate.

In 1989 and 1990, during a two-year period of regular and special sessions in California, a total of 443 bills and resolutions were introduced that included the term "seismic safety" or "earthquake." When the two-year session adjourned in 1990, a total of 164 had been sent to Governor Deukmejian. Of these, 137 bills and resolutions went onto the books, making this the single most productive period ever for seismic-safety legislation.

For comparison, only a total of 112 quake bills were signed into law in all the years between the great 1906 San Francisco earthquake and the Loma Prieta earthquake of 1989.

2,500 other buildings were damaged and 147 destroyed.

Current and former executive directors of the commission have mentioned a phenomenon they call the "window of opportunity." It is a period of time when the state's policy-makers – the Legislature and the governor – are extremely receptive to moving forward on seismic-safety policy issues. The commission spends a great deal of its time amassing information and ideas on how to advance seismic-safety public policy. Having these ideas adopted is a painstaking process. When a "window of opportunity" opens up, the process becomes much easier. This is the same phenomenon relating to the 1933 Long Beach earthquake – "the occurrence of natural disasters profoundly affects the persuasiveness of opposing interpretations of risk." (Also see "Historic California Earthquakes and Resulting Significant Legislation," in Appendix .)

The Loma Prieta earthquake, like the 1933 Long Beach and the 1971 San Fernando Valley earthquakes before it, provided such opportunities. The 1989-1990 session of the Legislature produced a historic number of earthquake-related laws (see sidebar on page 32). The commission was ready to provide the Legislature with policy ideas. One month before the Loma Prieta earthquake, the commission published *California At Risk: Reducing Earthquake Hazards, 1987-1992* (SSC 89-02). The report was an update of a report first issued in 1986 as a result of the California Earthquake Hazards Reduction Act of 1986. The report provided the state with a list of current and future tasks which, when undertaken, would reduce seismic risks in the state. The 1989 report listed 72 initiatives including:

- ***Existing Development*** – Twenty-four initiatives that described actions to identify, retrofit, or remove unsafe buildings, nonstructural building components, and supporting public-infrastructure components such as dams, transportation networks, and utilities.

- ***Emergency Planning and Response*** – Thirteen initiatives that described actions to improve emergency planning and response, including such services as fire suppression, emergency medical care, local and long-distance emergency communications, evacuation and temporary shelter, search and heavy rescue, and evaluation of unsafe, quake-damaged buildings.

- ***Future Development*** – Ten initiatives that concern construction of future buildings. These call for achieving safety objectives through better planning and regulation of land use, implementing and enforcing strong building codes, maintaining and applying the best available seismic information, and encouraging improved seismic designs.

- ***Recovery*** – Nine initiatives to speed recovery, including activities needed to stabilize a community and reestablish normalcy following an earthquake. To improve recovery capability, state and local governments should prepare plans and recovery programs in advance and be ready to establish local recovery authorities when needed.

- ***Education and Public Information*** – Ten initiatives that outline objectives to teach Californian students about earthquakes and how to respond to them, inform residents of steps they can take to reduce earthquake hazards, and encourage all citizens, businesses, and organizations to increase their earthquake preparedness.

- ***Research*** – Six initiatives to increase support for earthquake-related research in the fields of geology, seismology, engineering, emergency planning, and the behavioral sciences.

During the 1989-90 and the 1991-92 sessions of the Legislature, many of the commission's initiatives found their way into bills that went before the Assembly, Senate and the governor. One such bill AB 3897 (W. Brown), created a seismic-hazard mapping program. Immediately after the Loma Prieta earthquake, Assembly Speaker Willie Brown, who represented San Francisco, called the commission and indicated he wanted a bill dealing with seismic safety. The commission, because of its preplanning, was able to supply language for this program. It was enacted less than seven months after it was introduced.

On June 2, 1990, Governor Deukmejian signed Executive Order D-86-90, which required the director of the California Department of Transportation (Caltrans) to prepare a plan to review and retrofit transportation structures in the state and to establish a formal independent review process for plans and construction. The executive order requested the University of California and required the California State University system to give priority consideration to seismic safety in the allocation of funds for

constructions projects. The governor also required the commission to review state agencies' actions in response to the executive order.

During the 1989-1990 session, these notable bills were signed into law to address seismic safety:

- ***SB 920 (Rogers)*** required the Seismic Safety Commission to develop a state policy on acceptable levels of earthquake risk for new and existing state-owned buildings by January 1, 1991 (SSC 91-01).

- ***SB 1250 (Torres)*** placed the Earthquake Safety and Public Buildings Rehabilitation Bond Act of 1990 on the June ballot to authorize $300 million in state general obligation bonds for the reconstruction, repair, replacement, relocation, or seismic retrofitting of buildings owned by local government or the state. Proposition 122 was approved by the voters. Up to $3 million of the funds from the sale of the bonds was allocated to the commission to improve seismic retrofit practicer.

- ***SB 1742 (L. Greene)*** required local agencies to review the structural design and construction of certain bridges, and required the Caltrans director to establish a statewide priority list for retrofit projects based on these reviews.

- ***SB 2104 (Kopp)*** required Caltrans to prepare an inventory of all state-owned bridges that needed strengthening or replacement to meet seismic-safety standards, and to prepare a multi-year plan and schedule, along with cost estimates, for completing the retrofitting or replacement of those bridges.

- ***SB 2453 (Maddy)*** required surgical clinics to hire architects and structural engineers to assure that medical equipment is properly anchored.

- ***SCA 33 (Rogers)*** placed Proposition 127 on the state ballot to exclude the costs of seismic rehabilitation from property-tax reassessments. Proposition 127 was approved by the voters.

- ***AB 631 (Bradley)*** required the Department of Housing and Community Development to adopt regulations governing the installation of earthquake-resistant bracing systems on manufactured homes or mobilehomes.

- ***AB 725 (Hansen)*** extended to June 30, 1995, the expiration of the Southern California Earthquake Preparedness Project and the Bay Area Regional Earthquake Preparedness Project.

- ***AB 890 (Cortese)*** required local agencies to consult with the Department of Conservation and the Office of Emergency Services for information that they need to include in their safety elements. Allowed the Division of Mines and Geology to review the safety elements and comment on them.

- ***AB 1890 (Cortese)*** required new and replacement water heaters to be braced and anchored.

- ***AB 2959 (Klehs)*** required the Seismic Safety Commission to develop, adopt, and publish a Homeowner's Guide to Earthquake Preparedness by January 1, 1992 (SSC 97-01).

- ***AB 3313 (Woodruff)*** required the state architect and the Building Standards Commission – with the concurrence of the University of California, the California State University system, the Structural Engineers Association of California, and the Seismic Safety Commission – to develop and adopt seismic retrofit guidelines for state buildings, including public universities.

- ***AB 3897 (W. Brown)*** required the Division of Mines and Geology in the Department of Conservation to prepare maps of seismic-hazard zones in the state and to develop priorities for the mapping of those hazard zones. Required a property seller to disclose to any prospective purchaser the fact that a property is located within a seismic-hazard zone.

- ***SBX1 46 (Lockyer)*** provided that an architect or engineer who voluntarily and without compensation provides structural inspection services at the scene of a major earthquake at the request of a public official or building inspector shall not be liable for any personal injury, wrongful death, or property damage caused by the good faith, but negligent, inspection of a structure.

The legislative year 1991 continued the emphasis from the previous year. Of the 14 seismic-safety bills sponsored by the commission, 8 were chaptered into law. Two bills required residential and commercial property owners to disclose potential seismic defects

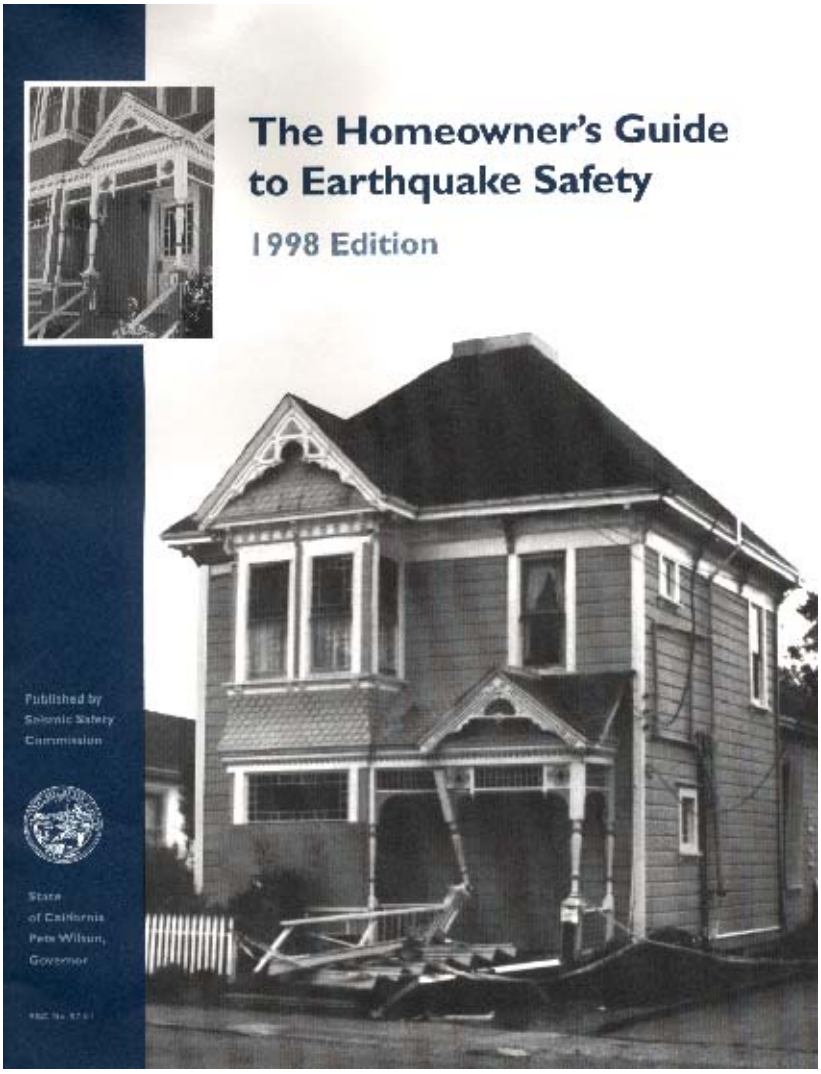
upon the sale of property. Other significant statute additions established retrofit standards for unreinforced masonry buildings and initiated action to provide funding for research proposals in the Commission's Earthquake Research Plan.

In 1991 and 1992, legislative activities that began after the Loma Prieta earthquake continued. That session of the Legislature saw the second-greatest number of bills signed into law dealing with seismic safety. Significant legislation included:

- ***SB 119 (Hart)*** enacted the Higher Education Facilities Bond Act of June 1992 and required five-year capital outlay plans at colleges and universities to include a schedule that prioritized the seismic retrofitting needed to significantly reduce seismic hazards.

- ***SB 122 (L. Greene)*** required that "essential services" buildings comply with locally adopted editions of the building code.

Collapse of the upper deck of the San Francisco Bay Bridge during the Loma Prieta earthquake in October 1989.



Before and after the 1992 earthquake that damaged this Victorian in Ferndale on the cover of the Commission's most widely-circulated publication.

- ***SB 597 (Alquist)*** required the state architect to develop seismic retrofit guidelines and standards for certain buildings enclosing more than 20,000 square feet of floor area with concrete or reinforced masonry column construction.

- ***SB 1716 (Craven)*** required a permit to be obtained each time an earthquake-resistant bracing system is replaced or altered on mobile homes.

- ***AB 43 (Floyd)*** excluded seismic retrofit improvements to hazardous buildings from property-tax reassessments.

- ***AB 200 (Cortese)*** required that sellers of wood-framed homes built before 1960 disclose earthquake weakness to buyers.

- ***AB 204 (Cortese)*** created a model, minimum building code for the retrofit of buildings with brick-bearing walls.

- ***AB 908 (Farr)*** specified that liquefaction and other seismic hazards are geologic hazards to be addressed in the safety element of a general plan.

- ***AB 1001 (Brown)*** allows counties and cities to issue general obligation bonds for the seismic strengthening of private buildings.

- ***AB 1230 (Hansen)*** required the Office of Statewide Health Planning and Development to approve three classes of inspectors, including "A" inspectors, who may inspect all phases of construction; "B" inspectors, who may inspect phases of construction other than structural; and "C" inspectors, who may inspect phases of construction projects that the statewide office determines do not materially alter the mechanical, electrical, architectural, or structural integrity of the health facility.

- ***AB 1968 (Areias)*** required the Seismic Safety Commission to develop, adopt, and publish a Commercial Property Owner's Guide to Earthquake Safety for distribution to real estate licensees (SSC 98-01).

Dam Safety, Tsunamis and the Northridge Earthquake, 1992-1996

Four significant earthquakes occurred in lightly populated regions in 1992 -- Cape Medocino, Joshua Tree, Landers, and Big Bear. Although state disasters were declared, major seismic-safety policy advancements were curtailed by budget constraints and a recovering economy.

The Seismic Hazards Mapping Program was expanded in 1991, to include earthquake-generated tidal waves, or tsunamis. The commission's staff prepared a report on tsunamis and the

commission held a hearing on the subject in late 1993.[9] The staff report pointed out that there had been 15 locally generated tsunamis in California since 1812. The report recommended the commission do all the following:

- Appoint a committee to address the potential tsunami risk to California.

- Support a program by the National Oceanic and Atmospheric Administration (NOAA) to develop standard methods of identifying tsunami inundation areas.

- Encourage NOAA to improve warning capability to include near-shore events.

- Cosponsor a tsunami conference in one year, as called for in the commission's *California at Risk* report.

- Send a letter to the California Congressional Delegation supporting NOAA's efforts to identify the tsunami hazards in California.

Apartments with soft stories that partially collapsed after the 1994 Northridge earthquake.

At 4:31 on the morning of January 17, 1994, a magnitude 6.7 earthquake with an epicenter near Northridge rocked the San Fernando Valley and neighboring regions. The earthquake hit very early on a national holiday when most residents were home asleep. Fifty-seven people lost their lives, nearly 9,000 were injured, and damage exceeded $20 billion. The Northridge earthquake

[9] Hearings on the Tsunami Threat to California before the Seismic Safety Commission October 14, 1993. (SSC 94-04)

demonstrated that although California's building codes and practices were generally adequate to protect most lives, they did not protect Californians from the economic disaster that a major earthquake can cause. In its 1995 report to Governor Pete Wilson on the Northridge earthquake,[10] the commission again provided a blueprint for hazard reduction. The report contained 168 recommendations in the following areas:

- Make seismic safety a priority.
- Improve the quality of construction.
- Reduce the risk from seismically vulnerable structures.
- Improve the performance of lifelines.
- Define acceptable risk.
- Provide incentives for risk reduction.
- Improve the use of earth-science knowledge to reduce risk.
- Improve the use of land-use planning to manage seismic risk.
- Improve the process of developing building codes.
- Support focused research.
- Improve state-level programs.

During the 1993-1994 session, three notable bills were signed into law that dealt with the Northridge earthquake:

- ***SB 131 (Roberti)*** placed the Earthquake Relief and Seismic Retrofit Bond Act of 1994 on the state ballot to authorize $2 billion in state general obligation bonds for: (1) the repair, renovation, reconstruction, replacement, or retrofit of transportation facilities and other public infrastructure, including schools, hospitals, utilities, sewers, and emergency centers, damaged by the quake; (2) earthquake hazard mitigation projects for public buildings and facilities in the counties of Los Angeles, Orange, and Ventura; (3) the seismic retrofit of state-owned transportation facilities throughout the state; and (4) housing repair loans to address the effects of the quake. It was approved by voters.

- ***SB 1953 (Alquist)*** required the Office of Statewide Health Planning and Development (OSHPD) to develop standards of earthquake performance categories for certain types of hospitals, including hospitals not in substantial compliance with the act. The measure also made OSHPD responsible for reviewing and approving seismic evaluations, compliance schedules, and

[10] *Northridge Earthquake: Turning Loss to Gain.*

construction documents developed by owners, as well as field review of work done. The bill set a deadline of January 1, 2008, by which time general acute-care hospital buildings that are determined to pose certain risks shall only be used for only non-acute care.

- ***AB 1958 (Katz)*** required contracts for seismic repair, replacement, and retrofit of highway bridges to be awarded to the lowest responsible bidder through a competitive bid contract.

An insurance-availability crisis immediately followed the Northridge earthquake. Because state law required insurance companies to offer earthquake insurance if they sold homeowners' insurance in the state, insurers felt they were faced with the risk of financial ruin should a subsequent earthquake strike California. By the summer of 1995, 95 percent of the homeowners insurance market was virtually shut down. Insurers who did not want to write earthquake policies started pulling out of the homeowners market. The California Earthquake Authority (CEA) was created in 1996 to stabilize the homeowners insurance market and stop the exodus from the state.

The insurance companies had claimed that their exposure to catastrophic loss was too great and that the 1 percent to 2 percent of their premium income from earthquake insurance was too small to continue to offer that line of insurance.

While the commission opposed some aspects of the legislation that created the CEA, the commission now has a memorandum of understanding with the CEA and the Department of Insurance to work together on seismic-safety issues of common interest.

The CEA began to write policies on December 1, 1996. Before it could become operational, insurers representing 70 percent of the earthquake-insurance market had to commit to participate in it. Policies now are issued by the CEA through its participating members.[11]

During the 1995-1996 session, four notable bills were signed into law that dealt with the seismic safety:

---

[11] The members include Allstate, Armed Forces Insurance Exchange, California Fair Plan, C.N.A., CSAA, Farmers, Golden Eagle, GuideOne, Interinsurance Exchange of the Automobile Club, Liberty Mutual, Merstar, Mercury, Prudential, State Farm, and USAA.

- ***SB 146 (Maddy)*** enacted the Seismic Retrofit Bond Act of 1996 to authorize $2 billion in state general obligation bonds for the seismic retrofit of state-owned highways and bridges throughout the state.

- ***SB 1864 (Alquist)*** requested the University of California to establish the California Center for Earthquake Engineering Research. It authorized the Seismic Safety Commission, in consultation with specified state agencies, to monitor the work of the center and to produce an annual evaluation of the work conducted at the center.

- ***AB 13 (McDonald)*** created the CEA with authorization to issue policies of basic residential earthquake insurance after certain preconditions were met.

- ***SB 1993 (Calderon)*** authorized the CEA to become operational and issue policies of basic residential earthquake insurance.

In September 1995, Tom Tobin resigned as the commission's executive director and Richard McCarthy, an engineering geologist on the commission's staff, was named acting executive director. One year later, Mr. McCarthy became the permanent executive director and to date serves in that position.

California Earthquake Loss Reduction Plan and Expanding Seismic-Safety Policy Initiatives, 1996-2000

In November 1997, the commission released its *California Earthquake Loss Reduction Plan* (SSC 97-02). The report was endorsed by Governor Wilson and became the state's plan to guide the executive and legislative branches in strategies and priorities for seismic safety. This blueprint, which complies with the Federal Emergency Management Agency's National Hazards Mitigation Strategy, is the state's hazard-mitigation plan required for federal funding. The plan incorporated lessons learned from the 1994 Northridge and 1995 Kobe, Japan, earthquakes and focused on 11 elements:

- Geosciences,
- Research and technology,
- Education and information,

- Economics,
- Land use,
- Existing buildings,
- New construction,
- Utilities and transportation,
- Preparedness,
- Emergency response, and
- Recovery.

The plan contains 44 strategies and 120 initiatives, each identifying recommended actions to be accomplished by the private sector, and state and local governments. During this period, the commission adopted its strategic plan – aimed at achieving the recommendations set forth in its 1997 *Loss Reduction Plan*. The four goals set out in the commission's strategic plan were:

- To assess the needs of the state and provide effective independent advice on seismic safety,

- To identify and secure resources to support reduction of earthquake losses,

- To serve as a clearinghouse and source for earthquake information and education materials, and

- To form partnerships in seismic-safety fields to ensure long-term reductions in earthquake losses.

In forming the partnerships described in No. 4 above, the commission entered into a number of memoranda of understanding (MOUs), including:

- ***Pacific Earthquake Engineering Research Center*** – an affiliation of nine major western research universities to develop a better engineering and scientific basis for performance-based earthquake engineering.

- ***Nevada Testing Institute*** – to apply full-scale structural testing.

- ***National Aeronautics and Lyndon B. Johnson Space Administration*** – to apply space technologies to achieve selective objectives of *California's Earthquake Loss Reduction Plan.*

During 1997, the commission acted as an intervenor in the rate hearings of the CEA. After months of testimony and hearings, the commission submitted an opening brief and reply brief to the administrative law judge hearing the case. The insurance commissioner's final decision in the case referenced the commission's recommendations 18 times and accepted two.

During the 1997-1998 session, two earthquake-related bills were signed into law:

- ***AB 1195 (Torlakson)*** provided that the required real-estate disclosure with respect to earthquake fault zones and seismic hazards need be given only if one of two specified conditions are met, and may be made in a natural-hazard disclosure statement, rather than by the real estate contract.

- ***AB 1302 (Wayne)*** required the San Diego Association of Governments to include a $33 million plan for seismic retrofit of the San Diego-Coronado Bridge in the regional transportation improvement program. Required not less than $10 million of the $33 million to be paid from local toll revenue reserve funds, and the balance to be paid from toll bridge revenue bonds.

During 1998, the commission began to identify incentives that would help encourage businesses and the public to take specific hazard-reduction actions before a damaging earthquake occurs. In June 1999, the commission approved a report, *Incentives to Improve California's Earthquake Safety: An Agenda in Waiting* (SSC 99-02), that provides a "menu" or "digest" of incentives to mitigate hazards. The commission intends to select one or more incentives per year to pursue in greater detail.

In 1999, the commission developed the *Post-Earthquake Investigation Guidelines* to guide for the commission, commission staff and professional experts in investigating earthquakes damage with the goal of improving future seismic safety. The commission found that post-earthquake investigations facilitate multidisciplinary reviews of existing or pending state earthquake policies concerning buildings, utility and transportation systems, emergency preparedness, response, and recovery. These investigations, along with hearings and reviews, become the starting points for recommendations concerning future seismic-safety policies.

In October 1999, the commission entered into an MOU with the Department of Insurance and the CEA. The MOU established a two-year agreement to work toward implementing the portions of *California's Earthquake Loss Reduction Plan* that concern earthquake insurance. The goal is to develop incentives and a cost-benefit analysis that will help reduce earthquake losses and speed recovery.

As a result of voter approval in June 1990 of Proposition 122, the Earthquake Safety and Public Buildings Rehabilitation Bond Act, the commission received $3 million for a seismic retrofit-practices program. The commission's publication, *Breaking the Pattern* (SSC 91-05), defined initial goals, priorities and criteria for evaluating the many options for funding retrofit projects, and recommended four products:

- ***Design Guidelines*** – to help retrofit-design professionals achieve reliable seismic performance in the retrofit of government-owned buildings.

- ***Earthquake Risk Management Tools*** – to allow facility managers to compare the degree of risk posed by different buildings and the costs and benefits of retrofitting so that these can be incorporated into more informed risk-management decisions.

- ***Short-term Research*** – to substantiate the reliability of seismic-retrofit provisions and risk-management tools. (More recently the commission has redirected resources away from this area since federal funding is now adequately addressing this issue.)

- ***Retrofit Information Transfer*** – to inform and educate building-design professionals, code-enforcement officials, plan checkers, inspectors and contractors about new retrofit provisions, commentary and risk-management tools.

The commission is now developing a report on the effectiveness of the commission's Proposition 122 retrofit products with recommendations for future retrofit programs.

In addition to improving seismic-safety policy, the commission also has focused on ensuring enacted policies are working effectively or

are not diluted or repealed. It also works to strengthen existing laws. The Field Act, designed to protect children, teachers and other staff in schools from death and injury and to protect the state's investment in school buildings, has come under periodic criticism. In 1999, recognizing a need to reassess and improve the act, the commission held two public hearings to solicit advice and recommendations. As a result, the commission recommended nine changes be made in the Field Act through legislative, regulatory or administrative means. They include:

- Identifying older Field Act-compliant schools now at risk.

- Grant stop-work authority to the Division of the State Architect to ensure effective code enforcement.

- Grant red-tag authority to the Division of the State Architect for rapid post-disaster damage assessment, and emergency management and recovery.

- Require complete code enforcement for mechanical, electrical, plumbing and architectural systems in new public-school construction.

- Require all school districts to evaluate nonstructural elements and abate unacceptable falling risks no later than 2010.

- Implement effective maintenance programs within each school district.

- Require the Division of the State Architect to evaluate in a timely manner the qualifications of any local agency desiring to plan-check construction plans of public schools.

- Strengthen the Private Schools Seismic Safety Act of 1986 to eliminate exemptions, publish regulations in the California Building Code and require compliance by new day-care facilities.

- Support benefit/cost studies to evaluate the effectiveness of higher construction costs for public school buildings.

In furthering its public education goal, the commission held a conference, *Living on Shaky Ground,* in cooperation with the Association of Bay Area Governments in October 1999 in Oakland. The goal was to learn lessons from the Loma Prieta earthquake in

how to become better prepared. The conference was attended by local government representatives, earthquake and emergency-preparedness professionals from around the country, and private-sector representatives of banking, insurance, and real estate industries.

Also in 1999, the commission moved into new office space just north of downtown Sacramento. The new office has been designed to serve as a post-earthquake information-distribution center.

In the 1999-2000 session, the Legislature and Governor Gray Davis enacted these bills:

- ***SB 1122 (Alarcon)*** required the Office of Emergency Services, in cooperation with the state Department of Education, the Department of General Services, and the Seismic Safety Commission, to develop an educational pamphlet for use by school and community-college personnel to identify and mitigate the risks posed by nonstructural earthquake hazards.

- ***SB 1899 (Burton)*** extended for one year the statute of limitations on insurance claims resulting from the 1994 Northridge earthquake, to January 1, 2002. It covers only policyholders who contacted an insurer prior to January 1, 2000, regarding damage from the Northridge earthquake. Policyholders who received court judgments or whose attorneys settled claims are not covered.

- ***AB 300 (Corbett)*** required the Department of General Services to conduct an inventory of public school buildings that are concrete tilt-up structures and school buildings with non-wood-frame walls that do not meet the minimum requirements of the 1976 Uniform Building Code. A report is due December 31, 2001. Also required the Department of General Services to pursue non-state funding of up to $500,000 for conducting a seismic-safety survey to identify the most vulnerable school buildings in the state.

- ***AB 880 (Dutra)*** required the Office of Emergency Services to procure mobile communication translators to enable mutual-aid emergency response agencies to communicate while operating on incompatible frequencies.

- ***AB 1291 (Corbett)*** revised the definition of "seismic retrofitting improvements" in exempting construction from property-tax reassessment requirements, and eliminated an expiration date on the tax exemption.

- ***AB 2791 (E. Alquist)*** authorized the Department of General Services to issue a stop-work order when construction work on a school building, a community college, or an essential-services facility is not being performed in accord with law and would compromise the structural integrity of the building.

On August 17, 1999, Turkey suffered a 7.4-magnitude earthquake that killed 17,000 and left over 42,000 homeless. The following month, on September 20, Taiwan was struck by a 7.6-magnitude earthquake that killed over 2,000, left more than 8,000 injured and destroyed over 13,000 high-rise apartment blocks to leave 180,000 homeless. In January 2000, the commission sent a post-earthquake investigation team to Taiwan and in March 2000 sent another to Turkey and Greece.

On September 3, 2000, a magnitude 5.2 earthquake struck the heart of Northern California's wine country in Napa Valley on a previously unmapped fault. The Commission, investigating the event in cooperation with the federal and state disaster response teams, found that residential structures sustained minor damage. Area residents also reported nonstructural damage throughout the City of Napa. In December 2000, the Commission convened a hearing in the City of Napa to gather information and recommendations from Napa-area emergency officials and residents.

The commission is now revisiting the issue of what is acceptable risk. In the past, acceptable risk was set at reducing and then eliminating deaths from an earthquake. Now the issue of economic recovery and business survivability and resumption are being discussed. The commission's recent report, *Incentives to Improve California's Earthquake Safety: An Agenda in Waiting* (SSC 99-02), is the first phase in the debate over what is acceptable risk.

As the commission begins its work in the 21st century, there is still much for it to accomplish. As Governor Wilson wrote at the time the commission released its *California Earthquake Loss Reduction Plan*:

> *Today in California there is an unacceptable level of risk created by the increasing frequency and magnitude of earthquakes coupled with a growing population… No one can prevent earthquakes nor can they accurately be predicted. However … we can significantly reduce the loss of life and property and work to speed up recovery.*

That has been and is the job of the California Seismic Safety Commission.

Appendices

Enacted Seismic-Safety Legislation – 1975-2000

1975-1976 SESSION

SB 5 (Alquist) – Renames the Alquist-Priolo Geologic Hazards Zones Act to the Alquist-Priolo Special Studies Zone Act and makes clarifying changes. **Chapter 61, Statutes of 1975.**

SB 58 (Alquist) – Allows local governments, that were previously exempt from collecting fees for building permits, to participate in the Strong Motion Instrumentation Program. **Chapter 47, Statutes of 1975.**

SB 505 (Alquist) – Provides reimbursement of $415,515 to local agencies for preparation of dam inundation and emergency evacuation maps. **Chapter 905, Statutes of 1975.**

SB 1340 (Alquist) – Extends the sunset date of the Seismic Safety Commission to January 1, 1981. **Chapter 112, Statutes of 1976.**

SB 1845 (Alquist) – Requires the Building Safety Board to report annually to the Seismic Safety Commission and adds seismic matters to its duties. Requires the Seismic Safety Commission to advise the State Geologist and Mining Board on seismic issues. **Chapter 1243, Statutes of 1976.**

SB 1950 (Alquist) – Provides no claim can be made against the state for the accuracy or inaccuracy of earthquake predictions. **Chapter 1267, Statutes of 1976.**

AB 31 (L. Greene) – Amends definitions of "school buildings" as used in the Field Act. **Chapter 37, Statutes of 1975**

AB 387 (Davis) – Establishes the Highway Emergency Fund to provide assistance to local jurisdictions for repair or replacement of highways damaged by earthquakes. **Chapter 36, Statutes of 1975.**

AB 451 (Pernio) – Exempts specific schools in the Stockton Unified School District from the provisions of the Field Act that prohibit use of unsafe buildings after June 30, 1975. **Chapter 60, Statutes of 1975.**

AB 730 (Alatorre) – Amends definitions of "school buildings" as used in the Field Act. **Chapter 256, Statutes of 1975.**

AB 1294 (Kapiloff) – Allows the use of State School Building Aid Bonds to replace or reconstruct specific U.S. Army and Air Force facilities. **Chapter 258, Statutes of 1975.**

AB 1843 (Cullen) – Redefines "hospital building" to include only licensed health facilities and excludes single story wood-framed facilities used for skilled nursing and intermediate care. **Chapter 177, Statutes of 1975.**

AB 2122 (Maddy) – Revises the School Construction Inspection program. **Chapter 554, Statutes of 1975.**

1977-1978 SESSION

SB 1081 (Alquist) – Requires the seismic design of a liquefied natural gas terminal to be addressed by the Public Utilities Commission. **Chapter 855, Statutes of 1977.**

SB 1279 (Alquist) – Requires the Seismic Safety Commission to conduct a study to determine the feasibility of establishing a comprehensive program of earthquake hazard reduction and earthquake prediction. **Chapter 154, Statutes of 1978.**

SB 1305 (Alquist) – Establishes a $50 per diem for members of the Seismic Safety Commission. **Chapter 1141, Statutes of 1978.**

SB 1308 (Alquist) – Requires that a statement be made referencing any soils or geologic report or soils and geologic reports that have been prepared specifically for a subdivision. **Chapter 521, Statutes of 1978.**

SB 1367 (Alquist) – Requires registration of state construction inspectors. **Chapter 1416, Statutes of 1978.**

SB 1686 (Alquist) – Permits the Office of Statewide Health Planning to waive seismic requirements for hospital construction or alteration when it is unnecessary unless the site is within special study zone. Requires adoption of seismic safety standards for hospital equipment and anchorages. **Chapter 835, Statutes of 1978.**

AB 428 (Lockyer) – Extends Field Act compliance deadlines for specific schools in the Oakland Unified School District. **Chapter 59, Statutes of 1977.**

AB 429 (Craven) – Extends Field Act compliance deadlines for a specific continuation high school. **Chapter 68, Statutes of 1977.**

AB 587 (Miller) – Extends Field Act compliance deadlines for a specific school. **Chapter 83, Statutes of 1977.**

AB 2752 (Wornum) – Provides technical changes for seismic safety elements of local general plans to allow a city to adopt that portion of a county element as pertains to the city. Requires each city and county to file a copy of their seismic safety element with the State Division of Mines and Geology. **Chapter 953, Statutes of 1978.**

AJR 14 (Lehman) – Requests that the president and Congress ensure that the Auburn Dam project is seismically safe. **Resolution Chapter 31, Statutes of 1977.**

1979-1980 SESSION

SB 33 (Petris) – Provides redevelopment and relocation assistance in the event of a disaster. **Chapter 60, Statutes of 1979.**

SB 331 (Robbins) – Enacts the State Building Standards Law and continues in existence the State Standards Building Commission. **Chapter 1152, Statutes of 1979.**

SB 405 (Alquist) – Extends the sunset date of the Seismic Safety Commission to January 1, 1986, and authorizes the commission to administer oaths and issue subpoenas. **Chapter 412, Statutes of 1979.**

SB 445 (Alquist) – Permits local jurisdictions to lower building standards for the rehabilitation of pre-1933 buildings. **Chapter 510, Statutes of 1979.**

SB 1269 (Craven) – Appropriates $1.6 million to repair or replace facilities damaged by the earthquake at the Imperial Valley campus of California State University. **Chapter 93, Statutes of 1980.**

SB 1777 (Carpenter) – Eliminates the requirement that an applicant for a subdivision provide a statement of soil conditions and depth and instead requires a statement of where such a report can be found. **Chapter 1355, Statutes of 1980.**

SB 1993 (Alquist) – Allows earthquake hazard reduction projects to be included as eligible items for local funding under the Municipal Improvement Act of 1911. **Chapter 771, Statutes of 1980.**

SCR 34 (Alquist) – Endorses the California/Mexico Symposium on Seismic Safety of the International Border Region. **Resolution Chapter 66, Statutes of 1979.**

AB 2202 (Vicencia) – Changes the basic authority of the Seismic Safety Commission to earthquake hazard mitigation. Establishes the Southern California Earthquake Preparedness Project and appropriates $750,000 to the Seismic Safety Commission to develop an earthquake response plan for a portion of Southern California. **Chapter 1046, Statutes of 1980.**

AB 2431 (Priolo) – Provides that property improved to meet local ordinances on seismic safety will not be considered "newly constructed" for property taxation purposes. **Chapter 674, Statutes of 1980.**

AB 2438 (Wray) – Authorizes local governments to adopt ordinances requiring seismic-safe gas shut-off valves in buildings open to the public. **Chapter 971, Statutes of 1980.**

ACR 96 (Perino) – Requests the Seismic Safety Commission to study the problem of mobile home bracing and make recommendations to the Department of Housing and Community Development for implementation. **Resolution Chapter 99, Statutes of 1980.**

1981-1982 SESSION

SB 360 (Alquist) – Requires mobile home bracing devices. Requires the Department of Housing and Community Development to administer program, test devices, and issue certifications. **Chapter 533, Statutes of 1981.**

SB 843 (Alquist) – Appropriates $250,000 from the Environmental License Plate fund for a contract with the Lawrence Hall of Science for a pilot earthquake education program in Los Angeles, Contra Costa and Alameda counties. **Chapter 785, Statutes of 1981.**

SB 961 (Alquist) – Requires the Office of Statewide Health Planning and Development to institute plan review and field inspection of hospital buildings being constructed to ensure building safety. Requires the State Fire Marshal to ensure fire safety of these buildings. **Chapter 303, Statutes of 1982.**

SB 1004 (Holmdahl) – Requires each state agency which adopts or has adopted building standards to pay annually to the Building Standards Commission a proportionate share of the cost of the review and publication of building standards which are published or proposed to be published in the State Building Standards Code. **Chapter 1082, Statutes of 1981.**

SB 1024 (Robbins) – Requires that if a regulation is determined to be a building standard, it becomes effective upon codification in the State Building Standards Code. **Chapter 1003, Statutes of 1981.**

SB 1209 (O'Keefe) – Permits a local legislative body to approve, disapprove or modify the recommendations of a planning commission on any proposed specific plan, regulation or amendment. **Chapter 923, Statutes of 1982.**

AB 604 (Rosenthal) – Authorizes a city or county to provide financing for modification or reconstruction of seismically unsafe private buildings and to issue bonds for the program. **Chapter 1602, Statutes of 1982.**

1983-1984 SESSION

SB 612 (Alquist) – Allows the Seismic Safety Commission to conduct a comprehensive investigation of the May 2, 1983,

earthquake that devastated the City of Coalinga, to publish a report to include lessons learned for earthquake preparation and mitigation, and to make recommendations to the governor and the Legislature. **Chapter 1191, Statutes of 1983.**

SB 1782 (Alquist) – Deletes the sunset provision for the Seismic Safety Commission and continues the commission's existence indefinitely. **Chapter 772, Statutes of 1984.**

SB 1893 (Petris) – Enacts the California Earthquake Education Act of 1984 to establish a project for the implementation of a statewide program of earthquake safety education and preparedness. Appropriates $525,000 to the Seismic Safety Commission to carryout these provisions. **Chapter 1558, Statutes of 1984.**

AB 2662 (Alatorre) – Appropriates $750,000 to the Seismic Safety Commission and the Office of Emergency Services for furthering comprehensive earthquake preparedness. **Chapter 313, Statutes of 1984.**

AB 2865 (McAlister) – Requires insurance companies to offer earthquake insurance and repealed the concurrent causation theory for earthquake damage. **Chapter 916, Statutes of 1984.**

AB 2786 (Katz) – Requires the governing board of each school district and the county superintendent of schools of each county to establish an earthquake emergency procedure system in every public and private school building under its jurisdiction having an occupant capacity of 50 or more students or more than one classroom. Requires the districts to allow the use of school buildings and grounds and equipment free of charge to public agencies, including the American Red Cross, for public shelters during disasters or other emergencies. **Chapter 1659, Statutes of 1984.**

AB 3321 (Alatorre) – Clarifies the liability of public entities upon the issuance of a warning as to the existence of an earthquake or volcanic prediction. **Chapter 1284, Statutes of 1984.**

AB 3935 (Farr) – Establishes the Economic Disaster Act of 1984 to provide for the planning and response of specified state agencies to disasters to reduce economic hardship stemming from certain disasters to business. **Chapter 1410, Statutes of 1984.**

1985-1986 SESSION

SB 239 (L. Greene) – Enacts the Essential Building Services Act and declares the intent of the Legislature that essential buildings be designed and constructed to resist earthquakes. Provides for design and construction requirements. **Chapter 1521, Statutes of 1985.**

SB 547 (Alquist) – Creates the Unreinforced Masonry Building Program to be administered by the Seismic Safety Commission. **Chapter 250, Statutes of 1986.**

SB 548 (Alquist) – Enacts the California Earthquake Hazards Reduction Act of 1986. Establishes the program within the Seismic Safety Commission and provides for a 5-year implementation period to be revised annually. **Chapter 1491, Statutes of 1985.**

SB 1030 (Carpenter) – Makes technical changes to statutes that register engineers. **Chapter 732, Statutes of 1985.**

SB 1238 (Roberti) – Appropriates $100,000 to the Seismic Safety Commission to conduct a feasibility study evaluating the effectiveness of an early warning system to detect seismic activity along the San Andreas Fault north of Los Angeles. **Chapter 1492, Statutes of 1986.**

SB 1590 (Robbins) – Prohibits an insurance company from withdrawing a line of insurance without prior notification of the insurance commissioner. **Chapter 1331, Statutes of 1986.**

SB 1667 (Petris) – Requires the Seismic Safety Commission to contract with public and private universities for the establishment of the California Center for Earthquake Engineering. **Chapter 381, Statutes of 1986.**

SB 1920 (Ayala) – Authorizes cities and counties to prepare plans and ordinances facilitating the expeditious and orderly recovery and reconstruction from a disaster. Requires the Seismic Safety Commission to enter into a grant with San Bernardino County for the development of a model plan. **Chapter 1470, Statutes of 1986.**

SB 1973 (Alquist) – Authorizes the Seismic Safety Commission to enter into cooperative agreements with nonprofit associations and

foundations to promote seismic safety. **Chapter 1115, Statutes of 1986.**

AB 938 (Alatorre) – Requires the Department of Conservation to develop a prototype earthquake prediction system on the San Andreas Fault. Requires the Office of Emergency Services to develop a comprehensive emergency response plan for short-term earthquake predictions. **Chapter 1198, Statutes of 1985.**

AB 939 (Johnston) – Amends provision dealing with the issuance of disaster bonds. **Chapter 1389, Statutes of 1986.**

AB 955 (Peace) – Requires the Department of Water Resources to prepare an emergency plan in the event of a Delta levee failure. **Chapter 1271, Statutes of 1985.**

AB 1103 (Bradley) – Increases the membership of the Building Safety Board to 17. **Chapter 731, Statutes of 1986.**

AB 3249 (Katz) – Requires private schools constructed after July 1, 1987 to have drawings and plans that meet applicable code standards. Requires the plans be reviewed and the construction be inspected. **Chapter 439, Statutes of 1986.**

AB 2933 (Tucker) – Requires the State Architect to certify seismic gas shut-off valves. **Chapter 268, Statutes of 1986.**

ACR 55 (Rogers) – Requests the State Architect to consider new technology that can mitigate the effects of earthquakes. **Resolution Chapter 119, Statutes of 1985.**

ACR 127 (Katz) – Proclaims the week of April 14-18, 1986, as Earthquake Preparedness Week. **Resolution Chapter 26, Statutes of 1986.**

1987-1988 SESSION

SB 593 (Morgan) – Increases funding for the Strong Motion Instrumentation Program. **Chapter 783, Statutes of 1987.**

SB 1410 (Bergeson) – Requires the Southern California Earthquake Preparedness Project area to be expanded to include

Imperial and San Diego counties. **Chapter 1243, Statutes of 1987.**

SCR 58 (Alquist) – Expresses the Legislature's interest in the status of the earthquake hazard reduction program and requests an annual report to be sent to specified legislative committees on progress on earthquake hazard reduction in carrying out the five-year plan. **Resolution Chapter 15, Statutes of 1988.**

AB 1885 (Floyd) – Requires the Department of Insurance to study earthquake insurance and report to the Legislature. **Chapter 1112, Statutes of 1987.**

ACR 28 (Katz) – Proclaims the month of April 1987 as California Earthquake Month and urges all Californians to engage in appropriate earthquake safety-related activities during that month. **Resolution Chapter 21, Statutes of 1987.**

ACR 106 (Katz) – Proclaims the month of April 1988 as California Earthquake Month and urges all Californians to engage in appropriate earthquake safety-related activities during that month. **Resolution Chapter 14, Statutes of 1988.**

1989-1990 SESSION

Regular Session

SB 424 (Alquist) – Permits the California Housing Insurance Fund to provide guarantee of loans for certain seismic safety improvements to be made upon certain buildings identified as potentially hazardous or hazardous to life in the event of an earthquake under specified existing provisions. **Chapter 1203, Statutes of 1989.**

SB 640 (Alquist) – Requires that a specified portion of state sales and use tax revenues attributable to the imposition of a ¼% increase in the tax be transferred to the Disaster Relief Fund for disbursements made for response to and recovery from the Loma Prieta earthquake, aftershocks, any related casualty, and for transfer to the Special Fund for Economic Uncertainties. **Chapter 174, Statutes of 1990.**

SB 850 (Dills) – Renames the Hospital Seismic Safety Act of 1983 to the Alfred E. Alquist Hospital Facilities Safety Act of 1983. **Chapter 396, Statutes of 1989.**

SB 920 (Rogers) – Requires the Seismic Safety Commission, in cooperation with the State Architect, to develop a state policy on acceptable levels of earthquake risk for new and existing state-owned buildings to be submitted to the Legislature by January 1, 1991. Provides that for the purposes of the constitutional provision, "newly constructed" or "new construction" does not include the portion of reconstruction of or installation in the building of seismic rehabilitation improvements, as specified, or earthquake hazard mitigation technologies. **Chapter 988, Statutes of 1989.**

SB 1250 (Torres) – Enacts the Earthquake Safety and Public Buildings Rehabilitation Bond Act of 1990 to authorize $300,000,000 in state general obligation bonds for the reconstruction, repair, replacement, relocation, or seismic retrofitting of buildings owned by local government and the state. **Chapter 23, Statutes of 1990.**

SB 1593 (Alquist) – Deems facilities seeking licensure as a surgical clinic to have met minimum construction standards if certain requirements have been met. **Chapter 1001, Statutes of 1989.**

SB 1742 (L. Greene) – Requires local agencies to review the structural design and construction details of specified bridges, and would require the director of Transportation to establish a statewide priority list for retrofit projects based on these inspections and the department and those counties to prepare retrofit plans, specifications, and estimates for projects included in the priority list. **Chapter 1082, Statutes of 1990.**

SB 1835 (Alquist) – Specifies that there would be an Earthquake Research Evaluation Conference, which would be organized and managed by the Seismic Safety Commission. The purpose of the conference would be to develop a strategy for earthquake research that will identify the state's seismic safety needs, including the need for specified areas of research. **Chapter 782, Statutes of 1990.**

SB 2104 (Kopp) – Requires the Department of Transportation to prepare an inventory of all state-owned bridges which require

strengthening or replacement to meet specified seismic safety standards, and to prepare a multi-year plan and schedule, along with cost estimates, for completing the retrofitting or replacement of all of those bridges. **Chapter 265, Statutes of 1990.**

SB 1942 (Lockyer) – Transfers $80,000,000 from the Special Fund for Economic Uncertainties to the San Francisco-Oakland Bay Bridge and I-880 Cypress Structure Disaster Fund. **Chapter 1669, Statutes of 1990.**

SB 2608 (C. Green) – Requires the insurance commissioner to appoint an advisory committee and requires the commissioner to conduct a study on the utilization of taxable revenue bonds and to issue a report regarding earthquake insurance. **Chapter 1169, Statutes of 1990.**

SB 2453 (Maddy) – Requires any facility licensed as a surgical clinic and any facility certified for participation in the federal Medicare program as an ambulatory surgical center, which, after January 1, 1991, anchors fixed medical equipment to the floor, roof, walls, or ceiling of the facility to retain the services of an architect licensed in California, a structural engineer licensed in California, or a civil engineer registered in California to assure that the equipment is properly anchored. **Chapter 1579, Statutes of 1990.**

SJR 9 (Campbell) – Requests the president to work with state and local agencies to develop a coordinated urban search and rescue response plan. **Resolution Chapter 63, Statutes of 1989.**

AB 631 (Bradley) – Requires the Department of Housing and Community Development to adopt regulations governing the installation of earthquake resistant bracing systems on manufactured homes or mobile homes. **Chapter 304, Statutes of 1989.**

AB 725 (Hansen) – Extends the to June 30, 1995, Southern California Earthquake Preparedness Project and the Bay Area Regional Earthquake Preparedness Project. **Chapter 1056, Statutes of 1989.**

AB 810 (Costa) – Permits cities and counties to assess the earthquake hazard in essential services buildings that were constructed prior to July 1, 1987, and that lack an effective system to resist seismic forces. Revises the definition of eligible costs to

include nonseismic and nonstructural costs, including, but not limited to, plaster, wallboard, paint, carpeting, and any other finishes deemed necessary by the local building official to restore an eligible building to its original conditions and suitable for occupancy, and would revise the findings which the local agency would be required to make in order to pay for those eligible costs to include the mitigation of potentially hazardous buildings. **Chapter 756, Statutes of 1989**

AB 818 (Areias) – Requires every owner or operator of a highway bridge open to the public, excluding bridges owned or operated by any federal or state agency, city, or county, to notify by January 1, 1991, the city or county, or both, in which the bridge is situated of its existence, date of construction, and length and width. Directs Caltrans to report on its comprehensive bridge management and inspection program, including a comprehensive review of that program; the status, progress, and results of its bridge management system development project; a review of the status and condition of publicly owned, operated, or maintained bridges; the development of a comprehensive plan of bridge maintenance, improvement, and repair needs; and the feasibility and cost effectiveness of bridge structural failure detection and warning devices. **Chapter 605, Statutes of 1989.**

AB 890 (Cortese) – Requires local agencies to consult with the Department of Conservation and the Office of Emergency Services for information that they need to include in their safety elements. Allows the Division of Mines and Geology to review the safety elements and comment on them. **Chapter 155, Statutes of 1989.**

AB 1274 (Hauser) – Changes the definition of bonds for the issuance of general obligation bonds in specified amounts for earthquake safety housing rehabilitation programs for various programs to provide housing to low, lower, or very low-income households. **Chapter 1193, Statutes of 1989.**

AB 1663 (Hauser) – Requires those funds appropriated by the Legislature for purposes of providing disaster relief to victims of a natural disaster resulting in a state of emergency proclaimed by the governor, to be expended only to the extent that other federal, state, local, or private insurance resources are not available or do not provide assistance or coverage. Permits disaster grant funds to be used for acquisition, rehabilitation, or lease of temporary shelters.

Adds additional housing disaster assistance provisions. **Chapter 19, Statutes of 1990.**

AB 1890 (Cortese) – Requires new and replacement water heaters to be braced and anchored. **Chapter 951, Statutes of 1989.**

AB 2347 (Kelley) – Exempts from the requirements of the Hospital Seismic Safety Act of 1982 certain freestanding buildings providing a specified percentage of outpatient clinic service to inpatients and instead, would require those facilities to comply with certain provisions of the State Building Code. **Chapter 1050, Statutes of 1989.**

AB 2959 (Klehs) – Requires the Seismic Safety Commission to develop, adopt, and publish a Homeowner's Guide to Earthquake Preparedness by January 1, 1992. **Chapter 1499, Statutes of 1990.**

AB 3209 (Costa) – Permits the city, county, or city and county to provide financing for specified costs to the owner of a building identified as seismically hazardous to pay for or buy out any existing note or deed of trust. Requires the city, county, or city and county to establish rules and regulations to ensure repayment of the funds being borrowed and to establish a minimum equity requirement that the owner must have in the property. **Chapter 378, Statutes of 1990.**

AB 3291 (Areias) – Provides that funds appropriated for the purposes of the Natural Disaster Assistance Act may be used to provide financial assistance for local agency and state costs for necessary and required site preparation costs for mobile homes, travel trailers, and other manufactured housing units provided by the federal temporary housing assistance program operated by the Federal Emergency Management Agency. **Chapter 1510, Statutes of 1990.**

AB 3313 (Woodruff) – Requires the state architect and the State Building Standards Commission, in consultation with, and with the concurrence of the University of California, the California State University, the Structural Engineers Association of California, and the Seismic Safety Commission, to develop and adopt building seismic safety retrofit guidelines for state buildings, including those owned by the University of California and by the California State University. **Chapter 1511, Statutes of 1990.**

AB 3556 (Cortese) – Authorizes a redevelopment agency to take those actions it determines necessary to make structural repairs to specified buildings, including historical buildings, to meet various specified building code standards relating to seismic safety. **Chapter 933, Statutes of 1990.**

AB 3897 (W. Brown) – Requires the State Mining and Geology Board to develop guidelines for the preparation of maps of seismic hazard zones in the state and to develop priorities for mapping of those hazard zones. Requires the state geologist to compile maps identifying seismic hazard zones. Requires the seller of real property to disclose to any prospective purchaser the fact that the property is located within a seismic hazard or delineated special studies zone if the maps or information contained in the maps are reasonably available. Requires a county receiving an official map to post notice of the location of the map. **Chapter 1168, Statutes of 1990.**

AB 4227 (Quackenbush) – Lengthens the loan guarantee periods for small business loans. No applications for loan guarantees for losses due to the Loma Prieta earthquake will be accepted by small business development corporations after September 1, 1990. **Chapter 1009, Statutes of 1990.**

ACR 11 (Katz) – Proclaims April 1989 as Earthquake Preparedness Month. **Resolution Chapter 17, Statutes of 1989.**

First Extraordinary Session

SBX1 38 (Petris) – Permits money received from Beverage Container Recycling Account by certified community conservation corps, not to exceed a total of $1,500,000, to be expended for disaster assistance activities associated with the October 17, 1989, earthquake. **Chapter 23, Statutes of 1989/90, First Extraordinary Session.**

SBX1 1 (Mello) – Amends the Natural Disaster Assistance Act to do all of the following:

- Expand the definition of local agency to include community college districts and private nonprofit organizations which are eligible for assistance under programs administered by the Federal Emergency Management Agency.
- Expand the definition of projects eligible for assistance to include public facilities used solely for recreation purposes.

- Expand the act's coverage to enable state reimbursement of local agencies for local funding match requirements which are imposed as part of federal disaster assistance programs not administered by the Federal Emergency Management Agency.
- Specify that the Natural Disaster Assistance Fund and its subsidiary accounts are continuously appropriated for purposes of the act.
- Eliminate the required 30-day waiting period before moneys from the Special Fund for Economic Uncertainties can be distributed to local agencies for disaster assistance.
- Authorize the allocation of funds within the Disaster Response-Emergency Operations Account to state agencies for emergency protective measures or activities necessary for the resumption of regular state and local government operations and services when the governor has proclaimed a state of emergency.
- Authorize the director of Finance to transfer moneys from the Special Fund for Economic Uncertainties to the Disaster Response-Emergency Operations Account as necessary to pay state agencies' costs for disaster response.
- Expand the state share for eligible projects from no more than 75% to up to 100% of total state eligible costs connected with the October 17, 1989, Loma Prieta earthquake.
- Provide that no public entity administering disaster assistance shall receive funds from the Disaster Response-Emergency Operations Account unless it administers that assistance according to specified criteria.

Chapter 2, Statutes of 1989/90, First Extraordinary Session

SBX1 3 (Marks) – Requires the state controller to establish the California Disaster Housing Rehabilitation Fund. Appropriates $32,000,000 from the Special Fund for Economic Uncertainties to the California Disaster Housing Rehabilitation Fund. **Chapter 4, Statutes of 1989/90, First Extraordinary Session.**

SBX1 4 (L. Greene) – Requires the controller to establish the California Disaster Housing Rehabilitation Fund. Establishes a natural disaster emergency shelter program, administered by the department, of grants to local governmental agencies and nonprofit organizations to provide emergency shelter to persons who have been rendered homeless as the result of a natural disaster. **Chapter 6, Statutes of 1989/90, First Extraordinary Session.**

SBX1 27 (Mello) – Permits a Mello-Roos district to pay for any work necessary to bring buildings into compliance with seismic

safety standards. Permits, within counties designated by the President of the United States as disaster areas, a Mello-Roos district to pay for any work deemed necessary to reconstruct, repair, shore up, or replace any building damaged or destroyed by the earthquake which occurred on October 17, 1989, or by its aftershocks. **Chapter 29, Statutes of 1989/90, First Extraordinary Session.**

SBX1 30 (Mello) – Adjusts the transmittal of sales and use taxes in areas effected as a result of the earthquake of October 17, 1989. **Chapter 37, Statutes of 1989/90, First Extraordinary Session.**

SBX1 33 (Mello) – Authorizes, from December 1, 1989, to December 31, 1990, a ¼% increase in the sales tax and a corresponding increase in the use tax. Places the revenues from the temporary tax increases into a newly created continuously appropriated relief fund, and limits the use of that fund to the funding of disbursements for purposes of response to and recovery from the earthquake, aftershocks, and any other related casualty. Appropriates $20,000,000 from the Disaster Relief Fund to the Department of Commerce to develop a model downtown earthquake recovery effort in the City of Whittier. **Chapter 14, Statutes of 1989/90, First Extraordinary Session.**

SBX1 34 (Garamendi) – Provides for purposes of the 1989-90 fiscal year, for the reassessment of, and deferral of property taxes upon, eligible property, as defined, damaged by earthquakes occurring in California in October 1989. **Chapter 16, Statutes of 1989/90, First Extraordinary Session.**

SBX1 36 (Kopp) – Includes within those projects which are exempt from CEQA, any project, as defined, which is undertaken for the emergency repair or restoration of any highway damaged by the October 17, 1989, earthquake. Appropriates $83,800,000 of which $80,000,000 would be from the account to the department for seismic retrofit projects, $1,000,000 from the Disaster Relief Fund to the department to develop seismic standards for state highways and bridges, and $3,800,000 from specified previously appropriated transit capital improvement funds for emergency ferry services and emergency transit operations. **Chapter 18, Statutes of 1989/90, First Extraordinary Session.**

SB 39 (Mello) – Revises procedures for determining the portion of taxes to be paid to the redevelopment agencies of the cities of Santa

Cruz and Watsonville for certain redevelopment projects which were already approved on or before October 17, 1989. **Chapter 26, Statutes of 1989/90, First Extraordinary Session.**

SBX1 40 (Campbell) – Increases that amount from $20,000,000 to $40,000,000 the director of Finance may allocate from the Special Fund for Economic Uncertainties for emergency or disaster response costs incurred by state or local agencies for the 1989-90 fiscal year. **Chapter 20, Statutes of 1989/90, First Extraordinary Session.**

SBX1 46 (Lockyer) – Provides that an architect or engineer who voluntarily, without compensation or expectation of compensation, provides structural inspection services at the scene of a declared national, state, or local emergency caused by a major earthquake at the request of a public official, public safety officer, or city or county building inspector acting in an official capacity shall not be liable in negligence for any personal injury, wrongful death, or property damage caused by the good faith but negligent inspection of a structure. **Chapter 30, Statutes of 1989/90, First Extraordinary Session.**

SBX1 48 (Mello) – Appropriates $2,553,000 from the Disaster Relief Fund to the Department of Commerce, to pay the 25% local match required to receive specified federal grants for five specified projects in the area damaged in the Loma Prieta earthquake. **Chapter 32, Statutes of 1989/90, First Extraordinary Session.**

SBX1 49 (Dills) – Specifies that, for purposes of disaster assistance associated with the October 17, 1989, earthquake, a private nonprofit organization eligible for disaster assistance under the Robert T. Stafford Disaster Relief and Emergency Assistance Act would also be eligible for, and may receive, assistance under the Natural Disaster Assistance Act. **Chapter 33, Statutes of 1989/90, First Extraordinary Session.**

ABX1 3 (Farr) – Permits the Pajaro Valley School District to use 97.8% of its average daily attendance for the second school month of the 1989-90 school year for calculation of its second principal apportionment for the 1989-90 school year in consideration of long-term enrollment loss it suffered as a result of the October 17, 1989, earthquake. **Chapter 27, Statutes of 1990.**

ABX1 5 (Eastin) – Appropriates $3,115,000 from the Disaster Relief Fund to the Metropolitan Transportation Commission and requires the commission to allocate those funds to the Department of Transportation, transit operators, and other entities with which the commission contracts, for ongoing operating and capital costs associated with providing emergency bus, rail, and ferry services, and public information programs necessary to implement the emergency transportation system management plan developed by the commission. Authorizes the commission to allocate funds to transportation agencies in San Benito, Monterey, and Santa Cruz Counties for the operating and capital costs associated with emergency bus and rail transit services provided as a result of earthquake damage in those counties, and for interregional bus service between Santa Clara County and Santa Cruz. **Chapter 28, Statutes of 1990.**

ABX1 9 (Epple) – Acting as an architect, engineer, or contractor without appropriate licensure will be made punishable as either a misdemeanor or a felony if committed in connection with the offer to perform services for repair of damage caused to a structure by natural disasters for which a specified state of emergency is proclaimed by the governor or for which a specified emergency or major disaster is declared by the president. **Chapter 36, Statutes of 1990.**

ABX1 15 (Cortese) – Appropriates from the Earthquake Safety and Public Buildings Rehabilitation Fund of 1990 to the commission, $140,000 for use during the 1990-91 fiscal year for the purpose of establishing guidelines for the administration and disbursement of funds for the reconstruction, repair, replacement, relocation, or seismic retrofitting of buildings owned by local governments or the state. **Chapter 31, Statutes of 1990.**

ABX1 16 (Cortese) – Requires the Office Statewide Health Planning and Development to design a policy study identifying health care services required during and after a disaster and seismic standards for those services, and a financial strategy which would enable identified settings to meet those standards. Requires the design of the study to include an assessment of the capacity, efficacy, and demand for medical services provided in nonhospital settings following a disaster. **Chapter 34, Statutes of 1990.**

ABX1 36 (Klehs) – Provides, for purposes of the 1989-90 fiscal year, for the reassessment of, and deferral of property taxes upon,

eligible property damaged by earthquakes occurring in California in October 1989. **Chapter 15, Statutes of 1989.**

ABX1 38 (Sher) – Includes within those projects which are exempt from CEQA, any project which is undertaken for the emergency repair or restoration of any highway damaged by the October 17, 1989, earthquake. Requires Caltrans to develop revised seismic standards for earthquake resistance to be utilized in the design and construction of new state highways and bridges and for the retrofit of existing highways and bridges. The bill would require Caltrans to incorporate state-of the art technology in those standards, to continue to revise and update the standards periodically, and to disseminate the standards, together with supporting data, to other public agencies engaged in the design, construction, or inspection of streets, roads, highways, and bridges. Creates the Seismic Safety Retrofit Account in the State Transportation Fund. **Chapter 17, Statutes of 1989.**

ABX1 39 (Seastrand) – Supplements the Budget Act of 1989 by appropriating $1,300,000 from the California Wildlife, Coastal, and Park Land Conservation Fund of 1988 to the Department of Parks and Recreation for emergency earthquake repairs and appropriates $170,850 from the Parklands Fund of 1984 to the department for local assistance for historical preservation purposes. **Chapter 8, Statutes of 1989.**

ABX1 40 (Farr) – Requires the Department of Commerce to administer the California Earthquake Emergency Grant Aid Program to make grants to cities and counties and specified small business entities for specified purposes to assist small businesses and communities to recover from the effects of the October 17, 1989, earthquake and related aftershocks. Appropriates $1,000,000 from the Disaster Relief Fund to the California Economic Development Grant and Loan Fund for expenditure to carry out the above purposes. **Chapter 12, Statutes of 1989.**

ABX1 44 (Hauser) – Establishes the Rural Emergency Assistance Housing Infrastructure Program under which the State Department of Commerce and the Department of Housing and Community Development makes grants to local agencies for the purpose of financing improvements necessary to serve emergency or temporary housing units, the location or designation of which has been made necessary by a natural disaster. Establishes a natural disaster emergency shelter program, administered by the

department, of grants to local governmental agencies and nonprofit organizations to provide emergency shelter to persons who have been rendered homeless as the result of a natural disaster. Appropriates $41,500,000 from the Special Fund for Economic Uncertainties for the various assistance programs described above. **Chapter 55, Statutes of 1989.**

ABX1 45 (W. Brown) – Provides a different procedure by which any person may file an application with the State Board of Allocation for compensation, including emergency payments, based on personal property loss, personal injury, or death, including noneconomic loss, arising from the collapse of the San Francisco-Oakland Bay Bridge or the I-880 Cypress structure caused by the October 17, 1989, earthquake. Waives the waiting period requirement for those unemployed individuals who file an application for benefits with the director of Employment Development between October 15, 1989, and December 2, 1989, if the claimant either resides in or was most recently employed in either an area identified by the Federal Disaster Assistance Administration or by a governor's declaration of a state of emergency, in connection with the October 17, 1989, Loma Prieta Earthquake. Transfers $30,000,000 from the Special Fund for Economic Uncertainties to the San Francisco-Oakland Bay Bridge and I-880 Cypress Structure Disaster Fund for purposes of the bill. **Chapter 22, Statutes of 1989.**

ABX1 48 (Areias) – Authorizes from December 1 1989, to December 31, 1990, a ¼% increase in the sales tax, and a corresponding increase in the use tax. Places the revenues from the temporary tax increases into a newly created continuously appropriated relief fund, and limits the use of that fund to the funding of disbursements for purposes of response to and recovery from earthquakes, aftershocks, and any other related casualties. **Chapter 13, Statutes of 1989.**

ABX1 53 (Elder) – Authorizes PERS and STRS to each establish a loan program to assist currently employed members and retirees to obtain loans for the sole purpose of repairing damages caused by a natural disaster to their homes or rebuilding those homes. **Chapter 35, Statutes of 1990.**

1991-1992 SESSION

SB 119 (Hart) – Enacts the Higher Education Facilities Bond Act of June 1992 and requires that any request for funds from the bonds issued pursuant to the bond act enacted by this bill be accompanied by the 5-year capital outlay plan of the particular university or college and include a schedule that prioritizes the seismic retrofitting needed to significantly reduce seismic hazards in buildings identified as high priority by the university or college. **Chapter 13, Statutes of 1992.**

SB 122 (L. Greene) – Requires that essential buildings comply with locally adopted editions of the building code, if the local agency is the enforcement agency and if the enforcement agency is the Office of the State Architect, the essential buildings must comply with all parts of the State Building Standards Code. **Chapter 72, Statutes of 1990.**

SB 597 (Alquist) – Requires the State Architect to develop seismic retrofit guidelines and standards for certain buildings enclosing more than 20,000 square feet of floor area with concrete or reinforced masonry column construction. **Chapter 1079, Statutes of 1992.**

SB 732 (Kopp) – Extends the deadline for the seismic inspection of bridges from December 31, 1991, to December 31, 1992, upon notification by a county and, in this event, the date for retrofitting or replacement of those bridges would be extended until December 31, 1993. **Chapter 775, Statutes of 1991.**

SB 1003 (McCorquodale) – Changes definitions of correctional treatment centers for purposes of seismic safety. **Chapter 1164, Statutes of 1992.**

SB 1245 (Alquist) – Establishes the Alfred E. Alquist Earthquake Act. Requires not more than 5 grant awards be made for the 1991-92 fiscal year to commercialize technologies relating to impending earthquakes. **Chapter 901, Statutes of 1991.**

SB 1390 (Alquist) – Authorizes the state geologist to exempt structures located within the jurisdiction of the City of Berkeley or the City of Oakland which were damaged by the East Bay Fire of 1991 from the Special Studies Zones Act upon application of the city if the structure is not situated upon a trace of an active fault line,

as delineated in an official special studies zone map, or more recent geologic data as determined by the state geologist, and subject to submission of specified documentation. **Chapter 506, Statutes of 1992.**

SB 1464 (Mello) – Authorizes payment to Mello-Roos Community Facilities to repair damages to real property from any earthquake would include counties or areas designated by the governor as disaster areas or on which the governor proclaims for the area the existence of a state of emergency, and would permit payment for work identified in a resolution of intention to establish a district within seven years of designation of a county as a disaster area. **Chapter 772, Statutes of 1992.**

SB 1716 (Craven) – Requires a permit to be obtained each time an earthquake resistant bracing system is replaced or altered on mobile homes. **Chapter 686, Statutes of 1992.**

AB 29 (Klehs) – Requires the Division of Mines and Geology to advise counties and cities as to the portion of the fee to be deposited in the Seismic Hazards Identification Fund, so that this information may be provided to building permit applicants. **Chapter 550, Statutes of 1991.**

AB 43 (Floyd) – Provides that "newly constructed" and "new construction" shall not include seismic retrofitting improvements and shall also not include improvements to a building, identified as hazardous, that utilize earthquake hazard mitigation technologies. **Chapter 8, Statutes of 1991.**

AB 65 (Tanner) – Extends, until June 30, 1992, the date funds from the Special Fund for Economic Uncertainties to the Disaster Response-Emergency Operations Account for disaster relief for the October 1, 1987, southern California earthquake and aftershocks may be expended. **Chapter 34, Statutes of 1991.**

AB 128 (Archie-Hudson) – Appropriates $2,572,000 to the Board of Governors of the California Community Colleges for allocation to the Los Angeles Community College District for the purpose of a seismic reduction project at the Los Angeles Southwest Community College. **Chapter 456, Statutes of 1991.**

AB 200 (Cortese) – Requires that the transferor of any real property built before January 1, 1960, containing any residential

dwelling with 1 to 4 living units of conventional, light wood-frame construction, as defined, as soon as practicable prior to the transfer, furnish a copy of a specified earthquake preparedness guide and make an earthquake hazards disclosure to the transferee. Requires the transferor of real property to disclose specified deficiencies within the transferor's actual knowledge. **Chapter 699, Statutes of 1991.**

AB 209 (Cortese) – Excludes from the definition of state or local government buildings, those owned by private for profit or private nonprofit corporations, or those owned by any combination, consortium, or joint powers agreement that includes a private nonprofit corporation. **Chapter 346, Statutes of 1991.**

AB 247 (Cortese) – Renumbers provisions of the California Earthquake Hazards Reduction Act and the Seismic Safety Commission Act. **Chapter 188, Statutes of 1991.**

AB 908 (Farr) – Specifies that liquefaction and other seismic hazards identified pursuant to specified provisions of law are geologic hazards to be addressed in the safety element of a general plan. **Chapter 823, Statutes of 1992.**

AB 958 (Areias) – Directs the Seismic Safety Commission to administer a privately funded task force, with specified membership, to consider the development of seismic safety building guidelines for the use of state and local governmental agencies in evaluating applications for the construction of new cellular facilities. **Chapter 813, Statutes of 1991.**

AB 1001 (Brown) – Expands the purposes for which counties and cities may issue bonds to include seismic strengthening of unreinforced buildings and other buildings. **Chapter 658, Statutes of 1991.**

AB 1091 (Klehs) – Permits the seller to furnish the required seismic hazard zone disclosure in the real estate contract and receipt for deposit. Authorizes the county to post the notice of the location of a seismic hazard map in any other location it determines necessary to achieve adequate distribution. **Chapter 250, Statutes of 1991.**

AB 1230 (Hansen) – Requires the Office of Statewide Health Planning and Development to approve one or more classes of

inspectors including, but not limited to, "A" inspectors, who may inspect all phases of construction, "B" inspectors, who may inspect all phases of construction, except structural, and "C" inspectors, who may inspect all phases of construction projects that the statewide office determines do not materially alter the mechanical, electrical, architectural, or structural integrity of the health facility. **Chapter 863, Statutes of 1991.**

AB 1700 (Farr) – Limits the definition of "disaster," for purposes of the Economic Disaster Act of 1984, to those specified emergency conditions when the estimated damage exceeds $3,000,000,000, or when the governor orders the director of Emergency Services to carry out provisions. Authorizes the legislative body, under the Municipal Improvement Act of 1913, to use the powers of that act to pay for work or to make loans deemed necessary to bring buildings, including privately owned buildings, into compliance with seismic safety standards or regulations of the Economic Disaster Act of 1984. **Chapter 18, Statutes of 1992.**

AB 1788 (Bane) – Augments a budget appropriation by $10,000,000 for the renovation and seismic upgrade of the Consumer Affairs Building in Sacramento. **Chapter 206, Statutes of 1991.**

AB 1873 (Bentley) – Removes the exception that cities and counties that have adopted an ordinance requiring installation of accelerographs in structures not collect strong motion building fees. Requires the first $50,000 derived from the fees and charges received from dam owners pursuant to the dam safety program of the Department of Water Resources to be deposited in the fund to be used for the instrumentation of dams. **Chapter 699, Statutes of 1991.**

AB 1963 (Areias) – Expresses findings and declarations of the Legislature with regard to unreinforced masonry buildings. Requires any owner of a building located in Seismic Zone 4 who receives a specified notice to post a prescribed sign at the entrance of the building, within a certain period. Requires the notice of the obligation to post the sign required by this bill be included in the Commercial Property Owner's Guide to Earthquake Safety. It would exempt unreinforced masonry construction from the notice-posting requirement if the walls are nonload bearing with steel or concrete frame. **Chapter 941, Statutes of 1992.**

AB 1965 (Areias) – Expands and restates the powers of a municipality under the act to make funds available for bringing real property and buildings into compliance with seismic safety standards and regulations. **Chapter 1197, Statutes of 1992.**

AB 1966 (Areias) – Authorizes the governor to make, amend, or rescind orders and regulations during a state of emergency that temporarily suspend any statute, ordinance, regulation, or rule imposing nonsafety related restrictions on the delivery of food products, pharmaceuticals, and other emergency necessities distributed through retail or institutional channels. **Chapter 1186, Statutes of 1991.**

AB 1968 (Areias) – Requires the Seismic Safety Commission to develop, adopt, and publish a Commercial Property Owner's Guide to Earthquake Safety for distribution to real estate licensees. **Chapter 859, Statutes of 1991.**

AB 2253 (Filante) – Authorizes the issuance of bonds and indebtedness to finance capital improvements or modifications relating to seismic safety of the Golden Gate Bridge. **Chapter 166, Statutes of 1992.**

AB 2358 (Frazee) – Specifies that, notwithstanding any other provision in the State Housing Law or in the State Building Standards Law, the building standards in Appendix Chapter 1 of the Uniform Code for Building Conservation of the International Conference of Building Officials, as published in the California Building Standards Code, do not apply to a local jurisdiction that has adopted on or before January 1, 1993, a program for mitigation of potentially hazardous buildings that includes the adoption by ordinance of a hazardous buildings program under specified provisions of law. **Chapter 346, Statutes of 1992.**

AB 3003 (Cortese) – Changes references to "adequate wall anchorage" sections of the 1991 Edition of the Uniform Building Code of the International Conference of Building Officials. **Chapter 307, Statutes of 1992.**

AB 3651 (Horcher) – Authorizes an infrastructure financing district to finance seismic retrofit of public capital facilities, and would include parking facilities among those types of specified public facilities that a district may finance. **Chapter 332, Statutes of 1992.**

Special Session

ABX1 31 (Hauser) – Extends loss carryover provisions to losses sustained as a result of earthquake, aftershock, or any other related casualty occurring in the County of Humboldt during April 1992. **Chapter 26, Statutes of 1992, First Extraordinary Session.**

ABX1 33 (Hauser) – Establishes similar property tax allocation provisions for the reassessment of property that is damaged or destroyed as a result of the earthquakes that occurred in California in April 1992. **Chapter 2, Statutes of 1992, First Extraordinary Session.**

ABX1 35 (Hauser) – Exempts from CEQA, any project, as defined, which is undertaken for the emergency repair or restoration of any highway damaged by the April 25, 1992, earthquake and its aftershocks, or the 1992 earthquake and aftershocks in San Bernardino and Riverside counties. **Chapter 22, Statutes of 1992, First Extraordinary Session.**

ABX1 57 (Woodruff) – Extends loss carryover provisions to losses sustained as a result of the earthquakes occurring in the County of San Bernardino in June and July of 1992, or any other related casualty for taxable or income years beginning on or after January 1, 1992. **Chapter 23, Statutes of 1992, First Extraordinary Session.**

ABX1 58 (Woodruff) – Provides for state allocations to eligible counties, declared by the governor to be in a state of disaster as a result of earthquakes occurring in the County of San Bernardino in June and July of 1992, of the estimated amounts of the reductions in property tax revenues on the regular secured roll and on the supplemental roll for the 1992-93 fiscal year, as a result of the reassessment of damaged properties under a reassessment ordinance. **Chapter 24, Statutes of 1992, First Extraordinary Session.**

1993-1994 SESSION

SB 131 (Roberti) – Enacts the Earthquake Relief and Seismic Retrofit Bond Act of 1994 to authorize $2,000,000,000 in state general obligation bonds for: (1) the repair, renovation, reconstruction, replacement, or retrofit of transportation facilities

and other public infrastructure, including schools, hospitals, utilities, sewers, and emergency centers, damaged by the January 17, 1994, Northridge earthquake; (2) earthquake hazard mitigation projects for public buildings and facilities in the counties of Los Angeles, Orange, and Ventura; (3) the seismic retrofit of state-owned transportation facilities throughout the state; and (4) housing repair loans to address the effects of the January 17, 1994, Northridge earthquake. **Chapter 15, Statutes of 1994.**

SB 805 (Bergeson) – Revises permit requirements for projects necessary for the public peace, health, or safety. Would create an ad hoc earthquake emergency and seismic retrofit permit review panel to hear and approve or deny appeals of local agencies subject to conditions by permitting agencies; and would exempt specified retrofit projects from various requirements. **Chapter 16, Statutes of 1993.**

SB 1953 (Alquist) – States the Legislature's findings that the Northridge earthquake demonstrated that hospitals built in accordance with this act suffered little damage while several built prior to the act suffered major damage. Requires the Office of Statewide Health Planning and Development to develop definitions of earthquake performance categories for certain types of hospitals, including hospitals that are not in substantial compliance with the act. Provides that the office is responsible for reviewing and approving seismic evaluations, compliance schedules, and construction documents that are developed by owners and field review of work done. Imposes certain requirements that the owners of all general acute care hospitals would be required to meet within a specified time. Provides that after January 1, 2008, general acute care hospital buildings that are determined to pose certain risks shall only be used for nonacute care hospital purposes**. Chapter 740, Statutes of 1994.**

AB 214 (Brown) – Permits the California Housing Loan Insurance Fund to administer a loan loss guarantee program in order to induce private lenders to make construction loans for seismic rehabilitation improvements. Authorizes the agency, for the purpose of using this fund for a specified multifamily seismic retrofit program, to waive a specified limitation on commercial space in order to facilitate the seismic retrofit of lower income housing. **Chapter 115, Statutes of 1993.**

AB 281 (Collins) – Deletes the requirement that the 15 members of the Seismic Safety Commission include 4 members from nominees submitted by the League of California Cities and the County Supervisors Association of California and would, instead, require the members of the commission to include 4 members from nominees submitted by the League of California Cities and the California State Association of Counties. Requires one of the members from nominees submitted by the League of California Cities and the California State Association of Counties to be a building official. **Chapter 26, Statues of 1993.**

AB 1677 (Hauser) – Extensively revises the California Disaster Housing Repair Fund disaster program. **Chapter 1105, Statutes of 1993.**

AB 1958 (Katz) – Requires contracts for seismic repair, replacement, and retrofit of highway bridges to be awarded to the lowest responsible bidder through a competitive bid contract. **Chapter 1012, Statutes of 1994.**

1995-1996 SESSION

SB 146 (Maddy) – Enacts the Seismic Retrofit Bond Act of 1996 to authorize $2 billion in state general obligation bonds for the seismic retrofit of state-owned highways and bridges throughout the state. **Chapter 310, Statutes of 1995.**

SB 577 (Rosenthal) – Replaces references to earthquake sensitive or seismic gas shutoff valves with the term earthquake sensitive or seismic gas shutoff devices. From its definition of "seismic gas shutoff device" references any device installed on a gas distribution system owned or operated by a public utility. Revises the bracing requirements for water heaters to apply to all new and replacement water heaters, and all existing residential water heaters, and would require any water heater to be secured in accordance with the California Plumbing Code. **Chapter 152, Statutes of 1996.**

SB 882 (Rosenthal) – Requires the Department of Insurance to establish a pilot program for the mediation of certain disputes over insurance claims arising out of the Northridge earthquake of 1994. **Chapter 848, Statutes of 1995.**

SB 1864 (Alquist) – Requests the University of California establish the California Center for Earthquake Engineering Research. Authorizes the Seismic Safety Commission, in consultation with specified state agencies, to monitor the work of the center and to produce an annual evaluation of the work conducted at the center. **Chapter 966, Statutes of 1996.**

SB 1993 (Calderon) – Authorizes the California Earthquake Authority to become operational and issue policies of basic residential earthquake insurance. **Chapter 967, Statutes of 1996.**

AB 13 (McDonald) – Creates the California Earthquake Authority, which would be authorized to issue policies of basic residential earthquake insurance. **Chapter 944, Statutes of 1995.**

AB 2086 (Knowles) – Revises the membership of the California Earthquake Authority's advisory panel and provides for its appointment by the governor rather than the insurance commissioner and provide for 4-year terms. **Chapter 968, Statues of 1996.**

1997-1998 SESSION

SB 485 (Craven) **-** Requires the local enforcement agencies to enter and inspect all mobilehome parks once every 8 years and to submit the required report to the Department of Housing and Community Development after completion of the program's first 7-year cycle and prior to March 1, 1999. **Chapter 773, Statutes of 1998.**

SB 708 (Greene) - Requires that the provisions of the Field Act be met for the specified relocatable buildings that are owned or leased prior to September 30, 1997, and for which no waiver has been granted before September 30, 1997, and be met for relocatable buildings that are purchased or leased on or after September 30, 1997. Specifies that any waiver granted by the State Allocation Board to a school district, that is in effect on September 29, 1997, is extended until September 30, 2000. **Chapter 320, Statutes of 1997.**

AB 425 (Baldwin) – Authorized a community college district to purchase, for use as a school building, any offsite building constructed prior to January 1, 1998, that meets certain structural

requirements. Authorized a community college district to lease, for use as a community college building, an offsite commercial building that meets certain structural requirements. **Chapter 610, Statutes of 1998.**

AB 865 (Pringle) – Provides that a school district may lease a commercial building prior to January 1, 2003, that does not meet the requirements of the Field Act, for use as a school building if the governing board of the school district finds that the building was constructed in accordance with seismic safety standards for commercial buildings constructed within an earthquake zone, the building permit for the initial construction of the building was issued on or after January 1, 1990, a structural engineer inspected the building and submitted a report, as specified, to the governing board of the school district, and the governing board submitted the report to the Division of the State Architect to determine if the building is in substantial compliance with the Field Act. **Chapter 629, Statutes of 1997.**

AB 1195 (Torlakson) – Provides that the disclosure with respect to earthquake fault zones and seismic hazards, need be given only if one of two specified conditions are met, and may be made in a natural hazard disclosure statement, rather than by the real estate contract and receipt for deposit. **Chapter 65, Statutes of 1998.**

AB 1302 (Wayne) – Requires the San Diego Association of Governments to include $33 million expenditure plan for seismic retrofit of the San Diego-Coronado Bridge in the regional transportation improvement program. Requires not less than $10 million of the $33 million to be paid from local toll revenue reserve funds, and the balance to be paid from toll bridge revenue bonds. **Chapter 777, Statutes of 1997.**

AB 1537 (Machado) – Requires the Department of General Services to evaluate and provide training for school construction inspectors. Requires the inspector to act under the direction of the governing board and the architect or structural engineer, as the board may direct. Requires the inspector to be responsible to the governing board for employment purposes, and to be responsible to the Department of General Services for enforcement of the plans and specifications of the school project. **Chapter 683, Statutes of 1997.**

Special Session

ABX1 6 (Torlakson) – Requires an additional disclosure by the seller to the prospective buyer with respect to real property located in an area subject to flooding or fire hazards to be made either by the issuance of a natural hazard disclosure statement or in a disclosure statement specified in existing law. Provides that the disclosure described above, with respect to earthquake fault zones and seismic hazards, need be given only if one of two specified conditions are met, and may be made in a natural hazard disclosure statement, rather than by the real estate contract and receipt for deposit. The bill would require the counties to post a notice identifying the location of specified maps or lists containing information regarding areas of potential flooding and fire hazard severity. **Chapter 7, Statutes of 1997 First Extraordinary Session.**

1999-2000 SESSION

SB 1122 (Alarcón) – Requires the Office of Emergency Services, in cooperation with the State Department of Education, the Department of General Services, and the Seismic Safety Commission, to develop an educational pamphlet for use by grades K-14 personnel to identify and mitigate the risks posed by nonstructural earthquake hazards. **Chapter 294, Statutes of 1999.**

SB 1871 (Alarcón) – Requires the Office of Emergency Services to establish a statewide disaster recovery plan addressing specified aspects of disaster recovery plans and procedures in the state. **(Vetoed by the Governor).**

SB 1899 (Burton) – Allows certain insurance claims for damages arising out of the Northridge earthquake of 1994 which were barred solely because the applicable statute of limitations has or had expired is revived and a cause of action thereon may be commenced provided that the action is commenced within one year of the effective date of the bill. **Pending in the Assembly.**

AB 300 (Corbett) – Requires the Department of General Services to conduct an inventory of public school buildings that are concrete tilt-up school buildings and school buildings with nonwood frame walls that do not meet the minimum requirements of the 1976

Uniform Building Code and to submit a report to the Legislature and the governor by December 31, 2001. Also requires the Department of General Services to pursue nonstate funding of up to $500,000 for the purposes of conducting a seismic safety survey to identify the most vulnerable school buildings in the state. **Chapter 504, Statutes of 1999.**

AB 880 (Dutra) – Requires the Office of Emergency Services to procure mobile communication translators to enable mutual-aid emergency response agencies to communicate effectively while operating on incompatible frequencies. **Chapter 356, Statutes of 1999.**

AB 964 (Aroner) – Requires the California Earthquake Authority to establish in the operational rules of the Earthquake Loss Mitigation Fund, a plan for the expedited expansion of the residential retrofit program statewide. **Chapter 715, Statutes of 1999.**

AB 1291 (Corbett) – Revises the definition of "seismic retrofitting improvements" for the purposes of Proposition 13 and eliminates the sunset date of the exclusion. **Chapter 504, Statutes of 1999.**

AB 2791 (E. Alquist) – Authorizes the Department of General Services to issue a stop-work order when construction work on a school building, a community college, or an essential services facility, as defined, is not being performed in accordance with existing law and would compromise the structural integrity of the building. **Chapter 463, Statutes of 2000.**

Selected Historic Publications from the California Seismic Safety Commission 1974 to 2000

SSC 2000-03	Seismic Safety Commission Findings: A Report to the Governor and the Legislature on Lessons Learned from Recent Earthquakes in Turkey, Greece, and Taiwan
SSC 2000-02	2000 Status of California's Unreinforced Masonry Building Law
SSC 2000-01	January 2000 Report to the Governor & the Legislature (activities during the 1999 Legislative Session)
SSC 99-06	Earthquake Risk Management Tools for Decision Makers: A Guide for Decision Makers
SSC 99-05	Earthquake Risk Management Tools for Decision Makers: Mitigation Success Stories
SSC 99-04	Earthquake Risk Management Tools for Decision Makers: A Toolkit for Decision-Makers
SSC 99-03	Built to Resist Earthquakes. The Path to Quality Seismic Design & Construction for Architects, Engineers, Inspectors. **Call ATC at 650-595-1542 for ordering**
SSC 99-02	Incentives to Improve California's Earthquake Safety: "An Agenda in Waiting"
SSC 99-01	Education and Technology Development to Reduce California's Earthquake Losses (A Review of the Pacific Earthquake Engineering Research Center)
SSC 99-00	January 1999 Report to the Governor & the Legislature (activities during the 1998 Legislative Session)
SSC 98-01	The Commercial Property Owner's Guide to Earthquake Safety (1998 Edition)
SSC 97-03	1997 Status of California's Unreinforced Masonry Building Law
SSC 97-02	California Earthquake Loss Reduction Plan
SSC 97-01	The Homeowner's Guide to Earthquake Safety 1998 Edition
SSC 96-02	National Seismic Safety Advisory Boards' Directory

SSC-96-01	Seismic Evaluation and Retrofit of Concrete Buildings, ATC-40 Product 1.2 & 1.3 **Call ATC at 650-595-1542 for ordering**
SSC 95-05	1995 Status of California's Unreinforced Masonry Building Law
SSC 95-04	1995 Recommended Model Ordinance for the Seismic Retrofit of Hazardous Unreinforced Masonry Bearing Wall Buildings. (This publications is included in SSC 95-05)
SSC 95-03	Public Safety Issues from the Northridge Earthquake of January 17, 1994
SSC 95-02	A Reconnaissance Report to the Seismic Safety Commission on the Hyogo-ken Nanbu Earthquake, (Neisei Nana Nen) The South Hyogo Prefecture near Kobe, Japan, January 17, 1995. By L. Thomas Tobin, Executive Director, Seismic Safety Commission
SSC 95-01	Northridge Earthquake: Turning Loss to Gain, Seismic Safety Commission Report to Governor Pete Wilson, Governor's Executive Order W-78-94
SSC 94-11	Northridge Earthquake, January 17, 1994—The Hospital Response. by Donald H. Cheu, MD
SSC 94-10	Research and Implementation Plan for Earthquake Risk Reduction in California
SSC 94-08	A Compendium of Background Reports on the Northridge Earthquake (January 17, 1994) for Executive Order W-78-94
SSC 94-07	Northridge Earthquake Hearings—Draft Transcripts of Hearings Held February 10 & 11 and March 2 & 3, 1994, (provided in ASCII text on either Macintosh or PC format 3.5 inch disks—specify disk format).
SSC 94-06	1994 Northridge Earthquake: Buildings Case Studies Project, Proposition 122, Product 3.2
SSC 94-05	Seismic Risk Management Tools, Product 2.1, includes Summary Report, 11 pages
SSC 94-04	The Tsunami Threat to California—Hearings before the California Seismic Safety Commission
SSC 94-03	Review of Seismic Research Results for Existing Buildings, Product 3.1

SSC 94-02	Provisional Commentary for Seismic Retrofit, Product 1.1
SSC 94-01C	California at Risk—1994 Status Report (94-01) and California at Risk: Reducing Earthquake Hazards 1992-1997 (91-08)
SSC 94-01	California at Risk — 1994 Status Report
SSC 93-03	Creating a Seismic Safety Advisory Board — A Guide to Earthquake Risk Management
SSC 93-02	Proposed Maps for NEHRP's Recommended Provisions
**SSC 92-01	Status of California's Unreinforced Masonry Building Law (Commission Report)
**SSC 91-08	California at Risk: Reducing Earthquake Hazards 1992-1997 (Commission Report)
**SSC 91-04	Status of California Unreinforced Masonry Building Law (Commission Report)
**SSC 91-03	Recommended Model Ordinance for the Seismic Retrofit of Hazardous Unreinforced Masonry Bearing Wall Buildings (Commission Report) {previously numbered 91-02}
**SSC 91-01	Policy on Acceptable Levels of Earthquake risk in State Buildings (Committee Report)
**SSC 90-04	California at Risk: Reducing Earthquake Hazards 1987 to 1992, 1990 Supplement to 1989 Edition (Commission Report)
**SSC 90-03	Status of California Unreinforced Masonry Building Law (Commission Report)
*SSC 90-01	A Draft Model Ordinance for the Seismic Retrofit of Hazardous Masonry Buildings (Commission Report)
**SSC 89-02	California at Risk: Reducing Earthquake Hazards 1987-1992, Year 4 (Commission Report)
**SSC 89-01	Status of the Unreinforced Masonry Building Law (Commission Report)
**SSC 88-03	Status of the Unreinforced Masonry Building Law (Commission Report)
**SSC 88-02	Advance Copy California at Risk: Reducing Earthquake Hazards 1987-1992 (Commission Report)

**SSC 87-01	California at Risk: Reducing Earthquake Hazards 1987-1992, Vols. I and II (Commission Report)
**1986	California at Risk: Reducing Earthquake Hazards 1987-1992, Vol. I and II (Commission Report)
**SSC 85-06	Rehabilitating Hazardous Masonry Buildings: A Draft Model Ordinance (Commission Report)
*SSC 85-05	A Review of the Seismic Safety Element Requirement in California (Committee Report)
*SSC 85-04	Earthquake Safety: Potentially Hazardous Buildings (Committee Report)
*SSC 85-03	Proceedings of the May 10, 1984 Hearing on the Morgan Hill/Halls Valley Earthquake of April 24, 1984: An Initial Assessment
*SSC 85-02	Proceedings of the Annual Meeting of the Western States Seismic Policy Council Oct. 17-19, 1984
*SSC 85-01	Report on the Coalinga Earthquake of May 2, 1983 (Kathleen J. Tierney)
*1985	Building Code Requirements for Seismic Safety, A Report to the California Legislature on the Effectiveness of SB 445 Statutes of 1979 Chapter 510 (Commission Report)
*SSC 84-01	Private Elementary and Secondary Schools and Earthquake Safety (Committee Report)
*SSC 83-10	Preliminary Reports Submitted to the Seismic Safety Commission on the May 2, 1983, Coalinga Earthquake (Transcripts from the July 14, 1983 Seismic Safety Commission meeting in Coalinga)
*SSC 83-09	A Brief Account of the Organization for Seismic Hazard Assessment in China (Zhu Chuanzhen)
*SSC 83-08	Preliminary Reports Submitted to the Seismic Safety Commission on the May 2, 1983 Coalinga Earthquake (Proceedings from the June 9, 1983 Seismic Safety Commission meeting)
*SSC 83-07	California's Earthquake Threat: Are Lawmakers Interested? (Vince Montane)
*SSC 83-06	Seismic Safety in California: Short History and Current Issues (Staff Report)
*SSC 83-05	The Construction Process (Commission Report)

*SSC 83-04	The Commission's Role in Earthquake Research (Commission Report)
*SSC 83-02	Responses in California to Earthquake Forecasts (Richard Andrews)
*1983	Final Report of the Earthquake Preparedness Task Force (Commission Report)
*SSC 82-01	Earthquake Hazards Management: An Action Plan for California and the Executive Summary, A report to the Governor & the Legislature (Commission Report)
*SSC 81-03	Report of the Precast Concrete Investigation Committee (Committee Report)
*SSC 81-01	Independent Review of Critical Facilities: With Special Emphasis on State-Federal Relationships and Dam Safety (Stanley Scott)
*SSC 604	Seismic Hazard Survey, State of California Buildings (H.J. Degenkolb Assoc.) 1981
*SSC 80-03	Selected Damaging California Earthquakes: A Reference to Earthquake Damage With Isoseismal Maps (Staff Report)
*SSC 80-02	Summary Report of the Western States Seismic Policy Council Conference, Second Annual Meeting
*SSC 79-07	Mobile Home and Earthquake Damage in California (Karl V. Steinbrugge, Eugene E. Schader, and S.T. Algermissen)
*SSC 79-06	Mobile Home Damage and Losses, Santa Barbara Earthquake Aug. 13, 1978 (Karl V. Steinbrugge, Eugene E. Schader)
*SSC 79-05	Public Official Attitudes Toward Disaster Preparedness in California; Appendices and Background Material (Committee Report)
*SSC 79-04	Guiding Action: Goals, Objectives, and Policies to Strengthen Earthquake Safety in California (Staff Report)
*SSC 79-03	Hazardous Buildings: Local Programs to Improve Life Safety (Committee Report)
*SSC 79-02	The Field Act and California Schools (Arthur Mann)

*SSC 79-01	Evaluating the Seismic Hazard of State Owned Buildings (Commission Report)
*SSC 46	Seismic Protection for Mobile Homes (Barrish, Aldrich, and Schroeter) 1979
*1979	Reassessing the Earthquake Hazards in California (Bruce A. Bolt)
*1978	Santa Barbara Earthquake, August 13, 1978 (Richard Buck, Bruce Baird)
*SSC 77-04	State Agency Budgets for Earthquake Programs for F.Y. 1977-78 (Staff Report)
*SSC 77-03	Report of the Task Committee of the Seismic Safety Committee on the Hospital Act of 1972 (Committee Report)
*SSC 77-02	State Agency Budget for Earthquake Programs for F.Y. 1976-77 (Staff Report)
*SSC 77-01	A Review of the Seismic Safety Element Requirement in California (Committee Report)
*SSC 76-02	Seismic Safety of Proposed Liquid Natural Gas Facilities in California (Committee Report)
*SSC 76-01	Report of Task Committee on the Seismic Safety Hazard From State Owned Buildings (Committee Report)
*1974	California Legislature Joint Committee on Seismic Safety (Senator Alfred Alquist)

*Out of Print
**Updated Annually

HISTORIC CALIFORNIA EARTHQUAKES AND RESULTING SIGNIFICANT LEGISLATION

California Earthquakes	Legislation
1769 – Orange County	
November 22, 1800 – San Diego	
December 8, 1812 – San Juan Capistrano	
June 10, 1812 – San Francisco	
January 1838 – San Francisco	
January 9, 1957 – Fort Tejon	
October 8, 1865 – San Francisco	
October 21, 1868 – Hayward	
March 26, 1872 – Owens Valley	
April 18, 1906 – San Francisco	
June 29, 1925 – Santa Barbara	
November 4, 1927 – Santa Barbara	
March 10, 1933 – Long Beach	The Field Act (AB 2342) and the Riley Act (AB 2391). Followed six years later by the Garrison Act.
May 18, 1940 – El Centro	
June 30, 1941 – Santa Barbara	
December 21, 1951 – Eureka	
August 22, 1952 – Bakersfield	
July 21, 1952 – Kern County	
March 22, 1957 – San Francisco	
February 9, 1971 – San Fernando Valley	Seismic Safety General Plan Element (SB 519), Hospital Seismic Safety Act (SB 352), Alquist-Priolo Earthquake Fault Zoning Act (SB 520), Strong Motion Instrumentation Program (SB 1374), State Capitol Seismic Evaluation (SCR 84), Dam Safety Act (SB 896)
February 21, 1973 – Point Mugu	
August 1, 1975 – Oroville	No liability for earthquake predictions (SB 1950, Highway Emergency Fund established (AB 387), School inspection program revised (AB 2122) Highway Emergency Fund (AB 387) and Seismic design of LNG facility (SB 1081).

August 13, 1978 – Santa Barbara	Earthquake hazard reduction program (SB 1279), Registration of construction inspectors (SB 1367) and Request that Auburn Dam be seismically safe (AJR 14)
August 6, 1979 – Gilroy/Hollister	Lower building standards for pre-1933 buildings (SB 445), So. CA Earthquake Preparedness Project (AB 2202), Seismic-safe gas valves (AB 2438) and Study of mobilehome bracing (ACR 96).
January 24, 1980 – Livermore	
May 27, 1980 – Owens Valley	
November 8, 1980 – Eureka	Mobilehome bracing devices (SB 360), Earthquake Education (SB 843), Hospital inspections (SB 961).
May 2, 1983 – Coalinga	Coalinga investigation (SB 612), Removal of SSC sunset date (SB 1782), Earthquake Education (SB 1893), Earthquake preparedness (AB 2662), and Earthquake insurance (AB 2865).
April 24, 1984 – Morgan Hill	Essential buildings (SB 239), Unreinforced masonry building program (SB 547), Hazardous buildings (SB 548), and Private school construction (AB 3249).
July 8, 1986 – Palm Springs	
June 13, 1986 – Oceanside	
July 21, 1986 – Chaifant Valley	
October 1&4, 1987 – Whittier	Funding for Strong Motion Instrumentation Program (SB 593), and Earthquake insurance study (AB 1885).
November 23&24, 1987 - Imperial County	

October 17, 1989 – Loma Prieta	Levels of risk (SB 920), Earthquake bond (SB 1250), Bridge inspections (SB 1742), Inventory of state bridges (SB 2104), Hospital anchorage (SB 2453), Mobilehome bracing (AB 631), So. CA Earthquake Preparedness Project (AB 725), Safety elements (AB 890), Water heaters (AB 1890), Homeowner's guide (AB 2959), Retrofit guidelines for state buildings (AB 3313), Seismic hazard mapping program (AB 3897), Liability for volunteers, (SBX1 46), Health care study (ABX1 16), Higher Ed bond Act (SB 119), Essential buildings (SB 122), Seismic retrofit guidelines (SB 597), Permits for mobilhome bracing (SB 1716), Retrofit not new construction (AB 43), Earthquake preparedness guide distribution (AB 200), Liquefaction in safety elements (AB 908), Local bonds for seismic safety (AB 1001), Classes of inspectors (AB 1230), Commercial owner's guide (AB 1968), Bond act to retrofit after Northridge earthquake (SB 131), Hospital seismic requirements (SB 1953) and transportation contracts – bidders (AB 1958).
February 28, 1990 – Upland	
June 28, 1991 – Sierra Madre	
April 22, 1992 – Joshua Tree	
April 25&26, 1992 – Cape Mendocino	
June 28, 1992 – Landers	
June 28, 1992 – Big Bear	
January 17, 1994 - Northridge	Transportation bond act (SB 146), Earthquake research (SB 1864), CA Earthquake Authority (AB 13),), CA Earthquake Authority (SB 1993)

EXECUTIVE DIRECTORS OF THE SEISMIC SAFETY COMMISSION
1975-2000

Name	Years of Service
Richard J. McCarthy	July 1995 – current
L. Thomas Tobin	February 1985 – July 1995
Richard Andrews	March 1982 – February 1985
Robert A. Olson	May 1975 – March 1982

COMMISSIONERS OF THE SEISMIC SAFETY COMMISSION
1975 – 2000

Current Commissioners	Term	Representing
Senator Richard Alarcón	2/99-present	Senate
Assemblywoman Elaine Alquist	3/97-present	Assembly
Andrew A. Adelman	3/00-present	Cities/Building Officials
Jerry C. Chang	11/93-present	Soils Engineering
Bruce R. Clark	5/00-present	Geology
Scott P. Haggerty	7/97-present	County Government
Jeffrey Johnson	1/94-present	Seismology
Donald O. Manning	8/97-present	Fire Protection
Douglas E. Mochizuki	3/00-present	Emergency Services
Stan Y. Moy	5/00-present	Architectural Planning
Ashok S. Patwardhan	3/00-present	Mechanical Engineering
Daniel Shapiro	5/95-present	Structural Engineering
Patricia Snyder	6/89-present	Social Services
Bill Gates (Alternate)		
Chris Modrzejewski (Alternate)		

Former Commissioners

Senator Alfred E. Alquist
J. Marx Ayres
Nettie Becker
Kenneth R. Blackman
Bruce A. Bolt
Ann F. Boren
Ezunial Burts
Robert L. Cheney
Lloyd S. Cluff
Emmett D. Condon
Assemblyman Dominic L. Cortese
LeRoy Crandall
Morgan W. Davis
Henry J. Degenkolb
Robert Downer
Daniel J. Eberle
John W. Englund
Charles R. Ford
Paul F. Fratessa
Louise P. Giersch
Homer Givin
Senator Leroy Greene
Frederick M. Herman
Wilfred "Bill" D. Iwan
Richard H. Jahns
Walter T. Johnson
Assemblyman Richard Katz
William Kesler
Assemblyman Jim Keysor
William J. Kockelman
Henry J. Lagorio
Corliss Lee
King S. Luc
George G. Mader
Arthur Mann
Robert E. McCarthy
Gary L. McGavin
James F. McMullen
Michal C. Moore
Rosemary F. Muller

Wilferd W. Peak
Will H. Perry
Robert B. Rigney
Barbara Cram Riordan
Assemblyman Don Rodgers
Katherine H. Russell
Stanley Scott
H. Bolton Seed
Lowell E. Shields
James E. Slosson
Richard Spees
Karl V. Steinbrugge
William T. Waste
H. Robert Wirtz
Donald L. Wolfe

Alternates

D. Michael Foulkes (Assemblywoman Alquist)
Chris Lindstrom (Senator Alquist)
Chris Modrzejewski (Senator Alarcón)
Vince Montane (Senator Alquist)
Robert Paschall (Assemblyman Rogers)
Randy Pestor (Assemblyman Cortese)
Keith Umemoto (Senator Alquist)
Tom White (Assemblyman Cortese)

STAFF OF THE SEISMIC SAFETY COMMISSION
1975 – 2000

Staff:

Bethany L. Adams
Richard A. Buck
Sally Cardenas
Karen Cogan
Timothy G. Cronin
William E. Dean
Irene Duci
Jonathan E. Faulks
Kathy Goodell
Minda Gosslin
Ed Hensley
Helen K. Van Houte
Roxanne J. Jones
Chris Lindstrom
John D. MacLeod
Dennis S. Mileti
Deborah Penny
Rosemary Raquindin
Mylene de la Rosa
Peter A. Stromberg
Fred Turner
Patricia J. Yeager
Brenda Boswell
Joy Calibo
Jerry Chang
Erica J. Cornelison
Rita Darden
Teri DeVriend
Janey M. Ellis
Marc Firestone
James Goodfellow
Carmen Harms
John Hobe
Beverly Johnson
G. Jean Laurin
Liz A. Lott
Carmen Marquez
Susan Pelzman
Edmundo A. Puchi
Henry Reyes
Henry Sepulveda
Brian Stoner
Kip Wiley
Laurie Zimmerman

Interns:

Bill Avey
Matt Bowden
Anthony Dailly
Bill Dean
Laura Fowler
Dan Hernandez
Jessica Loomis
Susan Merkel
Jennifer Rinna
Brenda P. Baird
Farrah D. Craig
Kyshia Davis
Judy Deng
Meg Halloran
Stephanie Hinrichs
Shawna Marsh
Ronnie Mitchell
Patrick Tyner