City of Long Beach
Working Together to Serve

Memorandum

4

Date: April 19, 2013

To: State Legislation Committee Staff

From: Larry Herrera, City Clerk

Subject: City Council Referral to the State Legislation Committee

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At the City Council meeting held Tuesday, April 2, 2013, the following agenda item was referred to the State Legislation Committee:

RESOLUTION IN SUPPORT OF SENATE BILL 135 TO CREATE A STATEWIDE EARTHQUAKE EARLY WARNING SYSTEM IN CALIFORNIA

A motion was made by Councilmember Johnson moved, seconded by Councilmember DeLong, that the communication be referred to the State Legislation Committee for consideration of support of Senator Alex Padilla's bill – SB 135 – that would create an earthquake early warning system in California.

LARRY G. HERRERA
City Clerk

Prepared by:
Carolyn Hill

Attachment

cc: Patrick H. West, City Manager
Suzanne Frick, Assistant City Manager
Reginald I. Harrison, Deputy City Manager
Tom Modica, Director of Government Affairs

R-13

City of Long Beach
Working Together to Serve

Office of Gerrie Schipske, R.N.P., J.D.
Councilwoman, Fifth District
Memorandum

Date: April 2, 2013

To: Honorable Mayor and City Council

From: Councilwoman Gerrie Schipske, Fifth District
Councilmember James Johnson, Seventh District

Subject: **AGENDA ITEM:** Request for Resolution in Support of Senate Bill 135 To Create a Statewide Earthquake Early Warning System in California

Discussion:

March 10 was the 80th Anniversary of the Long Beach earthquake. Since then we have experienced numerous earthquakes in California such as Loma Prieta, Northridge, Whittier Narrows, and Sylmar. And as we know that another major earthquake in California is not a matter of if, but when.

We cannot prevent an earthquake, but we should do more to prepare ourselves. Earthquake early warning systems are in place, or in the works, in a number of earthquake prone nations including Japan, Taiwan, Mexico, Turkey, Italy, China and Romania. They not only save lives, they help mitigate damage.

Japan's earthquake early warning system provided the public with critical advanced warning of the 9.0 magnitude earthquake in March 2011. Earthquake warnings were automatically broadcast on television and radio, and 52 million people received the warning on their smartphones. The warnings allowed people to take cover, assist loved ones, pull to the side of the road or exit a building. A professor at the University of Sendai received a text message of the warning and was able to warn his students to duck for cover before the shaking began and the light fixtures fell from the ceiling.

In California, the California Institute of Technology, UC Berkeley, US Geological Survey, California Geological Survey and others operate a demonstration earthquake early warning system called the California Integrated Seismic Network.

Senate Bill 135 would build upon that progress and calls for a fully developed statewide system that would detect seismic activity, determine the progression and alert people in advance of an approaching earthquake to save lives and mitigate damage. It could provide critical seconds and up to 60 seconds to assist trains, power down infrastructure, and turn off industrial machines. Such a system would not only alert the public via television, radio and smartphones, it would speed the response of police and fire personnel by quickly identifying areas hardest hit by the quake.

SB 135 would require the development of a comprehensive statewide earthquake early warning system in California. Senator Alex Padilla has requested that the City of Long Beach approve a resolution in support of SB 135 that would create an earthquake early warning system in California.

Fiscal Impact:

None

Recommendation:

It is moved that the City Council refer this matter to the State Legislative Committee for consideration of support of Senator Alex Padilla's bill – SB 135 – that would create an earthquake early warning system in California.

BILL ANALYSIS

SENATE COMMITTEE ON NATURAL RESOURCES AND WATER
Senator Fran Pavley, Chair
2013-2014 Regular Session

BILL NO: SB 135 HEARING DATE: April 23, 2013
AUTHOR: Padilla URGENCY: No
VERSION: April 2, 2013 CONSULTANT: Leonardo Scherer Alves
DUAL REFERRAL: No FISCAL: Yes
SUBJECT: Earthquake early warning system.

BACKGROUND AND EXISTING LAW
The California Geological Survey is located in the Department of Conservation and its mission is to provide scientific products and services about the state's geology, seismology and mineral resources that affect the health, safety, and business interests of the people of California.

California is the second most seismically active state in the country. The Uniform California Earthquake Rupture Forecast (UCERF) forecasts a 99.7% chance of a magnitude 6.7 or larger earthquake in the state during the next 30 years. The chance of an even greater quake of magnitude 7.5 or greater is 46%, over the same period of time. California's last significant earthquake was the 1994 Northridge event which caused tremendous damage, including 57 fatalities.

Some places, known for high seismic activity such as Japan, Turkey, Mexico, and Taiwan already have early warning systems. Japan is the only country with a nationwide public warning system, and the others have local systems. Other places, such as China, are currently developing similar systems. Unfortunately these systems seem to only be implemented after a killer earthquake strikes. All these detection systems are based upon the finding that the first waves emanating from the epicenter of the earthquake, primary waves (P-waves), cause less damage but travel faster than the slower and damage-causing secondary waves (S-waves). Therefore, through taking advantage of this feature in conjunction with a large network of seismic sensors, a warning signal could be sent before the arrival of the damaging S-waves.

PROPOSED LAW
This bill would require the Office of Emergency Services, in collaboration with the California Institute of Technology (Caltech), the California Geological Survey, the University of California Berkeley, the United States Geological Survey, and others, to develop a comprehensive statewide earthquake early warning system in California.

ARGUMENTS IN SUPPORT
According to the author "while earthquakes cannot be predicated or prevented, using advanced science and technology we can detect seismic activity to provide an advanced warning, save lives and help mitigate damage."

"California currently has the California Integrated Seismic Network (CISN), which is a demonstration earthquake early warning system. A fully developed system would process data from an array of sensors throughout the state. The system would effectively detect the strength and the progression of earthquakes, alert the public within seconds and provide up to 60 seconds advanced warning before potentially damaging ground shaking is felt."

"Earthquake early warning systems not only alert the public, they also speed the response of police, fire and other safety personnel by quickly identifying areas hardest hit by the quake."

COMMENTS
This bill is a work-in-progress . Should the bill be substantially amended in the future and should it pass this committee, the committee may wish to re-hear the bill.

Benefits of an early warning system (and limitations).
Early warning system can be used in a variety for examples such as slowing or stopping trains, warning airplane pilots and avoid take-offs and landings, and closing bridges. This system also could be used in industry and businesses to slow or stop production lines, moving employees to safe areas, stopping potentially dangerous procedures and securing dangerous areas. In hospital such system would prevent a series of accidents during operations and surgeries. It has been shown that a warning signal of as little as 30 seconds is enough to activate many automatic response systems and reduce significantly the number of casualties and financial losses caused by the tremors. The "big one" over the San Andreas fault possibly will give Los

Angeles 45 seconds warning - which could be critical in minimizing damages.

However, earthquakes cannot be predicted; therefore, by definition, there will be always blind zones. With technology advancement the size of the blind zone will continue to decrease but the people located immediately above the epicenter will always feel the tremors just seconds after it starts. Individuals further away from the epicenter will have more time to prepare. Further, a decision must be made to determine what magnitude that would trigger sending a message to the general public. Small tremors would create unnecessary chaos and using such system for minor quakes should be minimized.

California's current system .
Currently California has 300 sensors in place but hundreds more are needed, this will aid the detections of the early signs of a rupture and the collected data also will allow operators to determine the precise location and severity of the quake. California can use the current seismic network making the development of a robust, fully operational early warning system in California to cost only a fraction of the one in Japan. The author's office estimates the cost to be $16 million a year for a period of 5 years.

Other countries' experience
Japan spent $600 million dollars to build a system from the ground up. Japan's early warning system was developed after the 1995 Kobe earthquake that killed over 6,400 people. Mexico developed its system after the 1985 Mexico City earthquake; this 8.1 magnitude earthquake killed at least 10,000 people.

The Japanese success story springs from the partnership of public and private early warning systems. Japan Railways, a nationwide railway network, has had its own system for over 20 years. Although the current bill allows for participation by the private sector, it may be beneficial to include the intent to create these private and public sector partnerships explicitly.

Related legislation
AB 928 (Blakeslee) 2009-10 Session would have required the High-Speed Rail Authority to develop an earthquake early warning system and coordinate development of that system with public partners in order to protect infrastructure and public safety.

(Held in Assembly policy committee at author's request)

AB 1374 (Liu) 2005-06 Session. would have extended the assessment that supports the Seismic Safety Commission through July 1, 2013. (Vetoed - Governor's message stated, "Since we are reviewing how best to use the expertise the Commission provides, it is premature to extend the assessment that supports the Commission through 2013.")

SB 1049 (Budget Committee), Chapter 741, Statutes 2003 . established the authority through July 1, 2007 that Seismic Safety Account funds may be used to fund activities of the Seismic Safety Commission and related activities. This was a shift from the use of a mixture of money from the General Fund, seismic bond funds and reimbursement which had been used prior to 2003.

SUPPORT
California Institute of Technology
City of Bell Gardens
City of Coalinga
City of Culver City
City of Los Angeles
City of Rancho Cordova
City of South El Monte
City of West Hollywood
County of San Mateo
Mayor Bill Bogaard of the City of Pasadena
Mayor Rob Schroder of the City of Martinez
Town of Los Altos Hills
University of California
University of California, Berkeley

OPPOSITION
None Received

AMENDED IN SENATE APRIL 2, 2013

SENATE BILL No. 135

Introduced by Senator Padilla
(Coauthors: Senators Hill, Lieu, and Liu)
(Coauthors: Assembly Members Blumenfield, Gordon, Mullin, and Skinner)

January 28, 2013

An act to add Section 8587.8 to the Government Code, relating to earthquake safety.

LEGISLATIVE COUNSEL'S DIGEST

SB 135, as amended, Padilla. Earthquake early warning system.

There is in state government, pursuant to the Governor's Reorganization Plan No. 2, operative July 1, 2013, the Office of Emergency Services. Existing law requires the office to develop and distribute an educational pamphlet for use by kindergarten, any of grades 1 to 12, inclusive, and community college personnel to identify and mitigate the risks posed by nonstructural earthquake hazards.

This bill would require the office, in collaboration with various entities, including the United States Geological Survey, to develop a comprehensive statewide earthquake early warning system in California.

Vote: majority. Appropriation: no. Fiscal committee: yes. State-mandated local program: no.

The people of the State of California do enact as follows:

SECTION 1. The Legislature finds and declares the following:

(a) According to the United States Geological Survey, California is one of the most seismically active states, second only to Alaska.

(b) California has experienced dozens of disastrous earthquakes, which have caused loss of life, injury, and economic loss. Some of the most significant earthquakes in California's history include:

(1) The 1906 San Francisco earthquake, which, at a magnitude of 7.8, resulted in an estimated 3,000 deaths and over $500 million in property losses.

(2) The 1971 San Fernando earthquake, which, at a magnitude of 6.7, resulted in at least 65 deaths and caused property damage of over $500 million.

(3) The 1989 Loma Prieta earthquake, which, at a magnitude of 6.9, ~~rocked the bay area and~~ caused 63 fatalities and over $6 billion in property damage.

(4) The 1994 Northridge earthquake, which, at a magnitude of 6.7, claimed the lives of 60 people and caused estimated property damage of between $13 and $32 billion.

(c) About 90 percent of the world's earthquakes and over 80 percent of the world's largest earthquakes occur along the Circum-Pacific Belt, also known as the Pacific Ring of Fire. The Pacific Ring of Fire includes the very active San Andreas Fault Zone in California.

(d) The Uniform California Earthquake Rupture Forecast (UCERF) released in 2008 predicted a 99.7 percent likelihood of a magnitude 6.7 or larger earthquake in California in the next 30 years.

(e) A 2013 study published by the Caltech and the Japan Agency for Marine-Earth Science and Technology discovered that a statewide California earthquake involving both the Los Angeles and San Francisco metropolitan areas may be possible.

(f) Japan, Taiwan, Mexico, Turkey, Romania, Italy, and China either have or are working on earthquake early warning systems that are capable of saving lives and helping to mitigate loss.

(g) The Office of Emergency Services, Caltech, California Geological Survey, University of California at Berkeley, United States Geological Survey, and others have been conducting earthquake early warning research and development in California. They operate the California Integrated Seismic Network, which has a demonstration earthquake early warning capability.

(h) By building upon the California Integrated Seismic Network and processing data from an array of sensors throughout the state, a fully developed earthquake early warning system would

effectively detect some strength and progression of earthquakes and alert the public within seconds, sometimes up to 60 seconds, before potentially damaging ground shaking is felt.

(i) An earthquake early warning system should disseminate earthquake information in support of public safety, emergency response, and loss mitigation.

SEC. 2. Section 8587.8 is added to the Government Code, to read:

8587.8. The Office of Emergency Services, in collaboration with the California Institute of Technology (Caltech), the California Geological Survey, the University of California Berkeley, the United States Geological Survey, and others, shall develop a comprehensive statewide earthquake early warning system in California.

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