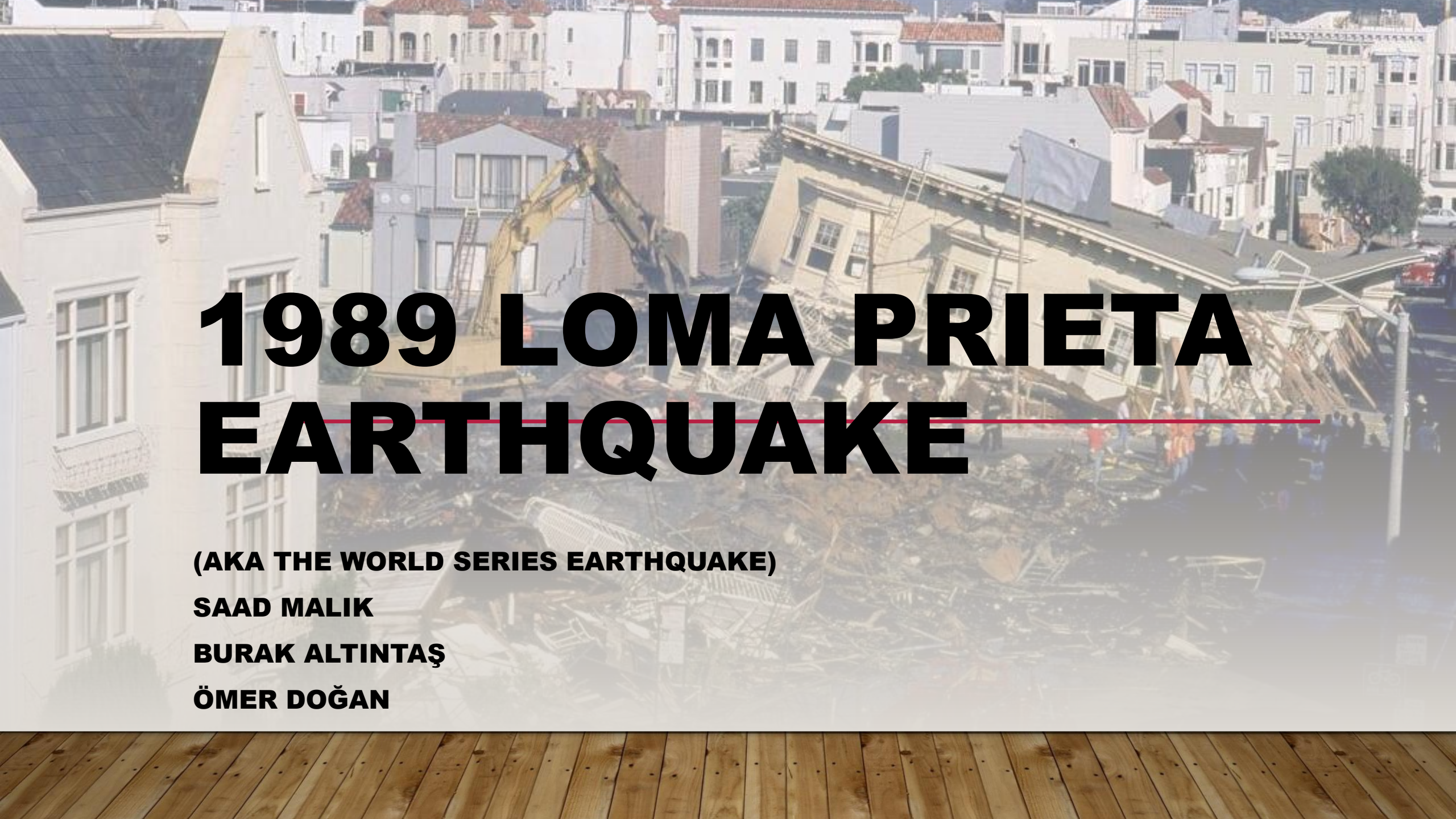


An aerial photograph of a city street in San Francisco following the 1989 Loma Prieta earthquake. A large yellow excavator is in the process of demolishing a multi-story building that has collapsed. The street is filled with debris, and other buildings in the background show signs of damage. The title '1989 LOMA PRIETA EARTHQUAKE' is overlaid in large, bold, black letters, with a red horizontal line underlining the word 'EARTHQUAKE'.

1989 LOMA PRIETA EARTHQUAKE

(AKA THE WORLD SERIES EARTHQUAKE)

SAAD MALIK

BURAK ALTINTAŞ

ÖMER DOĞAN

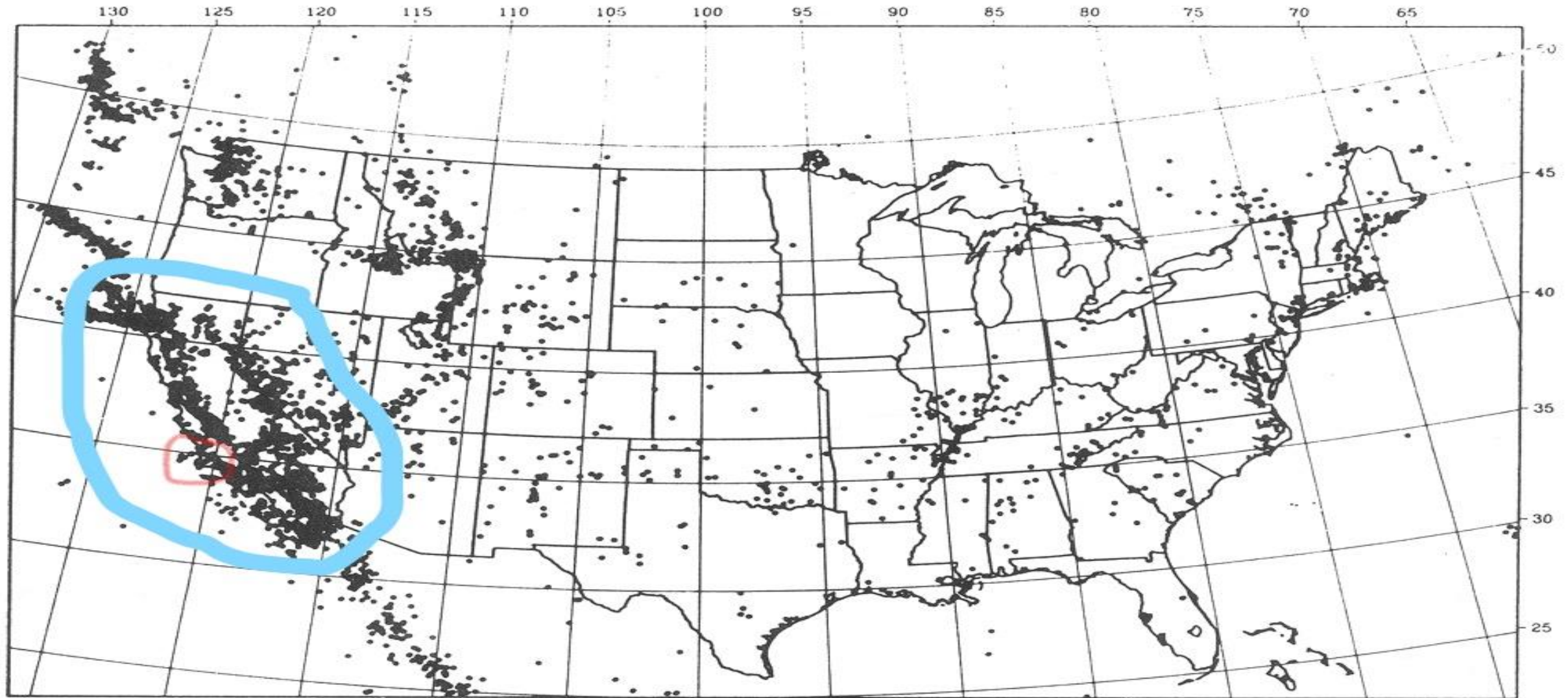
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2. Precautions
3. Disaster Management
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5. What was right/wrong?
6. Lessons Learned
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HOW LONG WAS THE EARTHQUAKE

- a. 1000-1500 sec
- b. 500-1000 sec
- c. 100-500 sec
- d. 10-15 sec

SEISMIC ACTIVITY THROUGHOUT THE USA



Overview of the disaster

8,000 square kilometer
area with a population
of about 4 million
people affected

Occurred at 5:04
PM 17th October
1989

63 Deaths

3,757
Injuries

3,000-12,000 people
homeless & 2600
businesses
damaged

Lasted 10–15 seconds
and measured 6.9 on
the moment
magnitude scale

Caused \$5 billion
in damages

42 casualties: Cypress
Street Viaduct collapse on
the Nimitz
Freeway (Interstate 880)

\$1.1 billion
earthquake relief
package for
California

Cypress City Viaduct

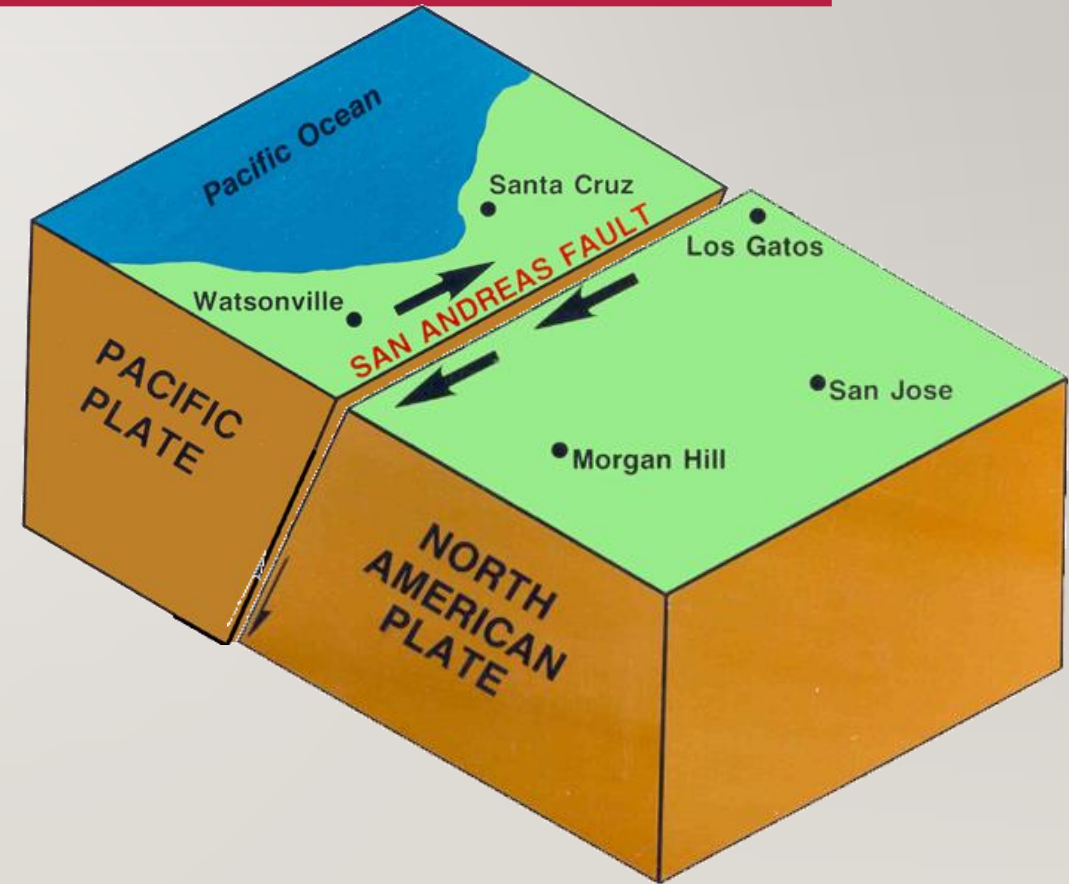


OVERVIEW OF THE DISASTER – ROOT CAUSE

- The San Andreas Fault line, which extends across most of North America, experienced an oblique slip caused the earthquake.

Effected Regions:

- California State (especially Oakland, Santa Cruz and San Francisco areas)
- Parts of Nevada



PRECAUTIONS

- 24 foot trailer communication tower was build in 1985 as forecasts required the state to provide such infrastructure
- The Los Angeles City Council passed in 1981 a law requiring the strengthening or razing of 8,000 weak buildings over a period that, with extensions, owners could stretch to a decade or longer.
- Seismic Safety Commission to develop plans to pinpoint and reduce potential architectural hazards that would be modified to withstand future earthquakes.
- Hospitals in the California area started to conduct drills regularly to prepare for a large number of casualties in the event of an earthquake.

Major League Baseball's World Series



gettyimages®

Otto Greule Jr

Disaster Management

Local volunteers helped by providing food, water, shelter and clearing debris (SC: 70%, SF:60%)

Local Populace warned about aftershocks by the government

31,000 Total number of Search and Rescue volunteers (SC:5%,SF:3%)

Bigger Organizations such as the Red Cross and Salvation army stepped into help

Counselling provided to victims by victims (SC:17%,SF:8%)

Disaster Management

Share a ride
service operated
by volunteers in
SC and SF to
reduce traffic

Channels
Broadcasting the
World Series at the
time switched off
their streams and
instead warned
locals of the
earthquake

Emergency water
supplies were
transferred to
affected areas from
the rest of California
to compensate for
damaged pipelines

WHAT WAS WRONG/RIGHT?

RIGHT

- THE EFFORTS OF THE GOVERNMENT IN MOBILISING THE LOCAL POPULATION
- THE GOVERNMENT WARNING ABOUT AFTERSHOCKS AND THE MEDIA GIVING INSTANT AND WIDE COVERAGE OF THE SITUATION
- GOVERNMENT COORDINATED RESPONSE AFTER THE EARTHQUAKE AND REQUEST FOR INFRASTRUCTURAL CHANGES
- MEDICAL INSTITUTIONS WERE PREPARED IN ADVANCE
- EARTHQUAKES IN NEIGHBOURING COUNTRIES WERE OBSERVED AND STUDIED BY THE SIESMIC COMMISSION OF US

WRONG

- CITIZENS WERE POORLY TRAINED ABOUT HOW TO ACT DURING EARTHQUAKES CAUSING A STATE OF PANIC AND CONFUSION
- OLD HISTORIC BUILDINGS WERE NOT RENOVATED ACCORDING TO EARTHQUAKE MEASURES.
- MANY BUILDINGS, ALTHOUGH RENOVATED, WERE BUILT IN AREAS PRONE TO LIQUEFACTION.

LESSONS LEARNED

- *The earthquake-readiness of highways and bridges are just as important as building readiness*
- *Single Road systems do not work in times of atrocities. There should be multiple roads incase of the main roads collapsing, as in the case of Loma Prieta.*
- *Quantity Does not equal quality; There were a lot of volunteers willing to help people in need after the earthquake but their sheer number and lack of training towards such situations created communicational and organizational difficulties. People, especially those living close to the fault lines, should have some form of post disaster training.*
- *Buildings should not be constructed in areas prone to post-quake liquefactions.*
- *Proper renovation is required for all buildings, despite historic nature. If such buildings were renovated, it could have prevented more casualties.*



Figure 5.9.8 Diagonal cracking of the east-side column of Bent 51 (south face).



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THANKS FOR LISTENING