



**Asia-Pacific
Economic Cooperation**

2014/TPTWG/WKSP/014

Hazard Mapping

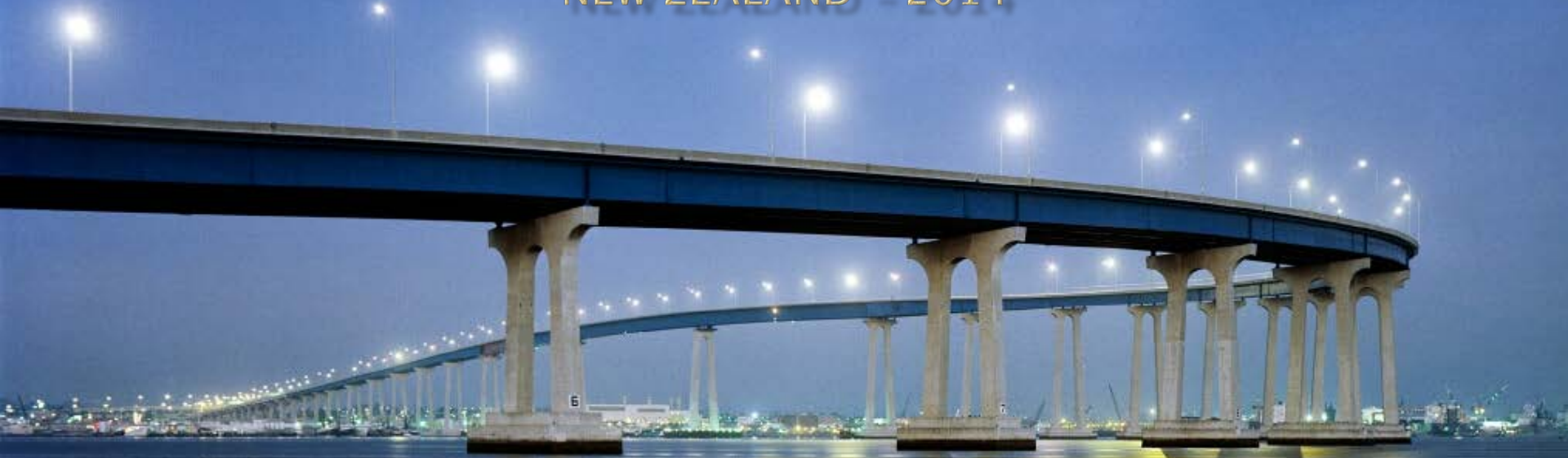
Submitted by: United States



**Workshop on Improving Global Supply Chain
Resilience: Advancing the Seven APEC
Principles in Your Organization
Christchurch, New Zealand
26-28 March 2014**

HAZARD MAPPING

APEC WORKSHOP ON IMPROVING GLOBAL SUPPLY CHAIN RESILIENCE
NEW ZEALAND - 2014



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Chief, Office of Emergency Management
California Department of Transportation



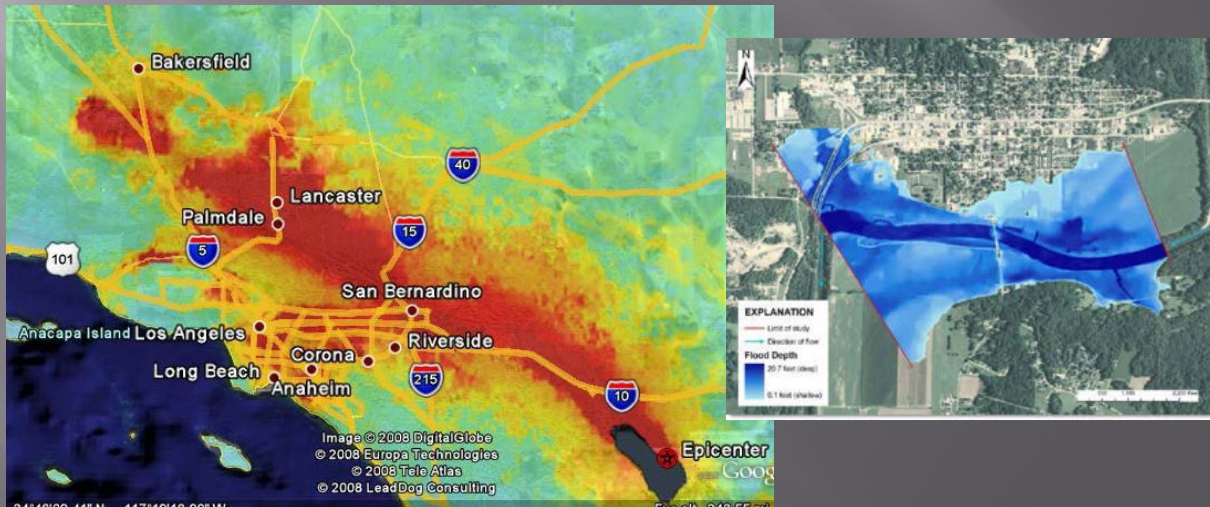
Caltrans uses the Four Phases of Emergency Management



To develop their Hazard Mapping procedures

PREPARATION

- ▣ The effective use of Hazard Maps decreases the magnitude of disasters
- ▣ Hazard Maps provide information on the range of possible damage and disaster prevention activities



RESPONSE

- ▣ Caltrans responds to damage from all types of hazards impacting California's State Transportation Corridors and the U.S. Highway System



- ▣ For Earthquake Response we use ShakeMap



SHAKEMAP at CALTRANS

- ShakeMap products are automatically delivered to Caltrans

Bridge Assessment Summary

Maximum Peak 1.0 sec Spectral Acceleration: 48.5782%g

Maximum Acceleration: (not measured)

Total number of bridges assessed: 219

Summary

High

Medium

Medium

Low

Bridge

Bridge

Accel

Bridge

58.0

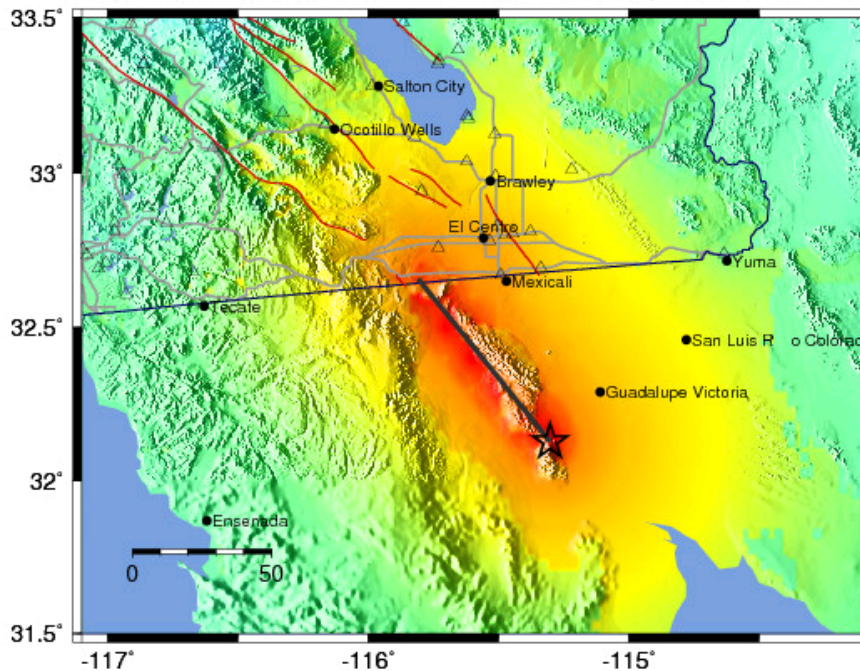
58.0

58.0

58.0

CISN ShakeMap : 39.0 mi SSE of Calexico, CA

Sun Apr 4, 2010 03:40:40 PM PDT M 7.2 N32.13 W115.30 Depth: 10.0km ID:14607652



Potential bridge damage is automatically analyzed based on Basoz & Mander methodology using ShakeMap peak spectral accelerations

Bridge inspection prioritization lists are emailed and paged out



RECOVERY

- ▣ Caltrans uses Strategic Highway System (STRAHNET) Mapping and U.S. Highway System (NHS) Mapping to restore function and mobility to affected City and County critical infrastructure
- ▣ Maps are often GIS based and provide a common operational picture



Emergency Management Common Operational Picture (EMCOP)

CA DATA EXCHANGE CENTER STATIONS

Station_No SAN ANGELES COTTAGE
 River_Basin SAN MATEO CREEK
 County SAN MATEO
 Longitude -122.408
 Latitude 37.579

Flood Warnings

- USGS STATIONS
- CDEC STATIONS
- FLOOD HAZARD AREAS
 - 1% Annual Chance Flood Hazard
 - 0.2% Annual Chance Flood Hazard
 - Area with Reduced Flood Risk due to Levee Zone
 - Regulatory Floodway
 - Undetermined Flood Hazard

Disasters can be grouped into two main categories: natural and man-made disasters. Natural disasters are the consequences of natural hazards that affect people, whereas man-made disasters are caused by human actions. Experience from recent emergencies revealed that supply chain activities in the early phase of emergency response (including procurement and transport of relief items) tend to involve a lot of activity starting outside of the affected area, in the strategic zones.

EMERGENCY SUPPLY CHAIN

A critical factor in planning for emergency response is the geographical location in which your supply chain is initiated. In its earliest operations, where you decide to start moving your emergency supplies, there will have an enormous impact on your speed of response. Supply chain starts from the point at which supplies are initiated in an emergency response and continues to the point at which these reach their respective destination. The supply chain includes all processes from initial procurement to and point delivery at implementation sites and has both temporal and geographical dimensions. Supplies consist of relief items, personnel/equipment, and transportation and construction resources, among others. Most of the supplies fall into the relief item category.

LAND USE

- General Unaffiliated Areas
- Water Reservation
- Department of California
- National Forest
- National Park Service
- Water

D.O.T. FACILITIES

- California Highway Maintenance Station

SEAPORTS

- Shipping Port Terminal

RAIL

- AMTRAK Rail Depot
- AMTRAK Rail Line

State of California
 Department of Transportation
 Division of Maintenance
 Office of Emergency Management



Emergency Management Common Operational Picture (EMCOP)

Google Street View - Multiple Views

San Francisco, California

Caltrans Layers

- Layer Visibility
- Highway Camera Location
- CHP Facilities
- Changeable Message Signs
- STATE BRIDGE
- LOCAL BRIDGE
- MAINTENANCE FACILITIES
- COMMERCIAL VEHICLE FMV
- TELECOMMUNICATION TOOLS
- CALTRANS DISTRICT OFFICE



VELOCITY	VE...	AR...	BFE_REVE...	DEP_REVE...	SOI...
-9999.00			-9999.00	-9999.00	11823
-9999.00			-9999.00	-9999.00	11823
-9999.00			-9999.00	-9999.00	0000
-9999.00			-9999.00	-9999.00	0000
-9999.00			-9999.00	-9999.00	0000
-9999.00			-9999.00	-9999.00	0000
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MITIGATION

- Hazard Mapping helps to identify, prioritize, and allocate resources to populations in potential high risk areas for safe evacuation, rescue, relief and rehabilitation



TRANSPORTATION STUDIES

Transportation Research Circular E-C169

ISSN 097-8515

Measuring the Transportation System from a Supply Chain Perspective

- ▣ “A supply chain view of the transportation system must collectively consider all aspects of the commodity being shipped,...recognizing that freight crosses jurisdictions, modes, industries, and is constantly changing to meet higher service standards and lower cost expectations”

THANK YOU!