

San Bernardino County Essential Facilities Risk Assessment (SBEFRA)

HAZUS Kick-Off Meeting

September 26, 2007



FEMA MAP IX-Mainland

1

Meeting Agenda

- Welcome and Special Guests
- Project Overview
- Technical Discussion
- Community Participation
- Next Steps
- Open Discussion



FEMA

2

Emergency Management Philosophy

- Today's challenges in emergency management require pro-active planning, risk assessment and information sharing.
- We need to leverage innovative technologies and public-private partnerships to better address disaster planning and management.
- The first step is to assess vulnerabilities and the population at risk before we can mitigate and manage the risk.
- Government (Federal, State & Local) and Community participation is essential.



FEMA

3

Project Goal

- San Bernardino County is one of several communities to be selected for this comprehensive multi-hazard HAZUS-Map Mod Risk Assessment.
- The DFIRM update provides us with an excellent opportunity to demonstrate the synergies between FEMA's Map Modernization (Map Mod) Project and FEMA's HAZUS® natural hazard loss estimation software, with products useful to emergency preparedness and hazard mitigation planning.



FEMA

4

Hazard Mitigation Plans

- Importance of having a Hazard Mitigation Plan
 - Disaster Relief Funding
 - Mitigation Funding
- 5 year update
- Status of communities in San Bernardino County
 - 58 organizations in San Bernardino Co. with Hazard Mitigation Plans
 - FEMA Approved Plans in 2005
 - For 21 Cities, plus the County
 - For 37 Special Districts



FEMA

Funding Impacted by the HMP

Individual Assistance

After a disaster, Federal funds are provided to qualified individuals to facilitate recovery. Assistance comes in the form of low interest loans*, housing assistance, cash grants etc.



Not impacted by plan

Public Assistance

Categories A & B: Emergency measures and debris removal



Not impacted by plan

Categories C-G: Reconstruction of public facilities and infrastructure to current codes and standards.



An approved State or Tribal plan is required in order to receive funding.

Mitigation

Hazard Mitigation Grant Program (HMGP): A portion of the total disaster grants (disaster operations cost less administrative costs) may be awarded by FEMA to the impacted State to implement long-term hazard mitigation measures after a major disaster declaration.



An approved State or Tribal and Local, Multi-jurisdictional or Local Tribal plan is required in order to receive funding for projects. Funding support for planning remains available only at the local level.

Pre-Disaster Mitigation Program (PDM-C): An annual competitive grant not tied to a disaster.



FEMA

Project Overview

- Effort to be guided by a Community Executive Committee led by San Bernardino County
- Essential Facilities Data Collection and HAZUS Incorporation
- Incorporation of County Assessor's data, if available.
- Earthquake Hazard Scenario Selection (2) and Risk Assessment
- Incorporation of DFIRM data into HAZUS
- Flood Risk Assessment (Two 100 yr events, w/ & w/out levees & one 500 yr event)
- Risk Assessment Report
- One year schedule



FEMA

7

Vision for the Executive Committee

- San Bernardino County to coordinate the CEC and will invite representatives to participate
- We hope it will establish representation from local communities and agencies to work with FEMA for enhancement of the County's capabilities for natural hazard risk assessment.
- Other county HAZUS projects have CECs with representatives from Cities & the County, in the areas of Emergency Management, Fire, Police, Schools, Hospitals/EMS, Indian Reservations, and Congressional Representatives.
- The working group will meet 3 times over the next year to guide development, ensure usability of products, and result in the best possible risk information for San Bernardino County.



FEMA

8

What Value Are the Results?

- Risk Assessment results feed directly into Hazard Mitigation Planning
- Establishes a Community Executive Committee knowledgeable about the process, results, and future directions.
- Centralized GIS Data to be shared with community partners:
 - Essential Facilities
 - Enhanced Regional Building Inventory, if developed
 - Risk Assessment Report for Flood and Earthquake DFIRM data layers



FEMA

9

Technical Discussion: Introduction to HAZUS



FEMA

Overview of HAZUS (Hazards US) Software

- Standardized, nationally applicable earthquake, flood and wind loss estimation methodologies.
- Developed by FEMA, under a cooperative agreement with NIBS (see <http://nibs.org/hazusweb/> and <http://www.fema.gov/plan/prevent/hazus/>).
- Uses PC-based Geographic Information System (GIS) software, ArcGIS (Requires installation of ArcGIS 9.1, ArcGIS 9.1 Service Pack 1, and Spatial Analyst 9.x for flood modeling)
- HAZUS is distributed to users free of charge
- Next release scheduled for Summer 2007



FEMA

11

What does HAZUS do?

- Estimates physical damage to:
 - Buildings and their contents
 - Essential facilities (including hospitals, schools, etc.)
 - Transportation lifelines (e.g., Bridges)
 - Utility lifelines (e.g., electric power, water systems)
- Assesses how populations might be affected
 - Shelter needs
 - Casualties (Earthquake only)
 - Power and water outage (Earthquake only)



FEMA

12

How does HAZUS estimate losses?

- Predicts damage and estimates dollar losses for:
 - Buildings
 - Lifelines
 - Regional economy
- Answers 'what if' questions
 - Building code modifications
 - Levee or flow regulation structure
 - And much more...



FEMA

13

HAZUS' Benefits

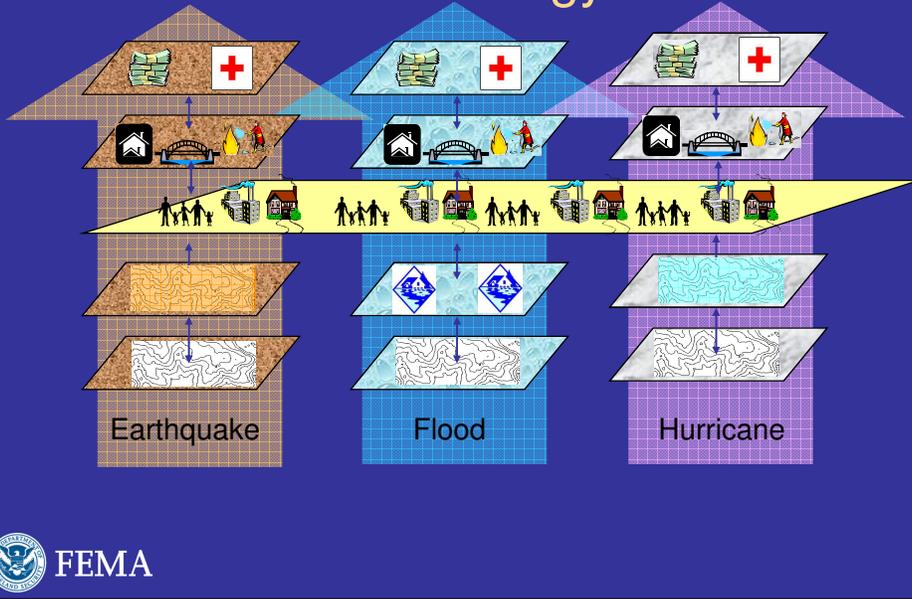
- HAZUS-MH allows user to:
 - **IDENTIFY** vulnerable areas that may require planning considerations
 - **ASSESS** level of readiness and preparedness to deal with a disaster before disaster occurs
 - **ESTIMATE** potential losses from specific hazard events (before or after a disaster hits)
 - **DECIDE** on how to allocate resources for most effective and efficient response and recovery
 - **PRIORITIZE** mitigation measures that need to be implemented to reduce future losses (what if)



FEMA

14

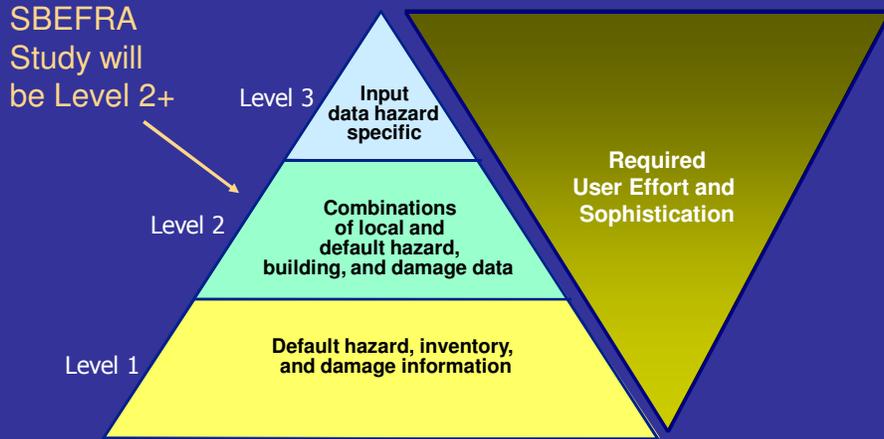
HAZUS-MH Loss Estimation Methodology



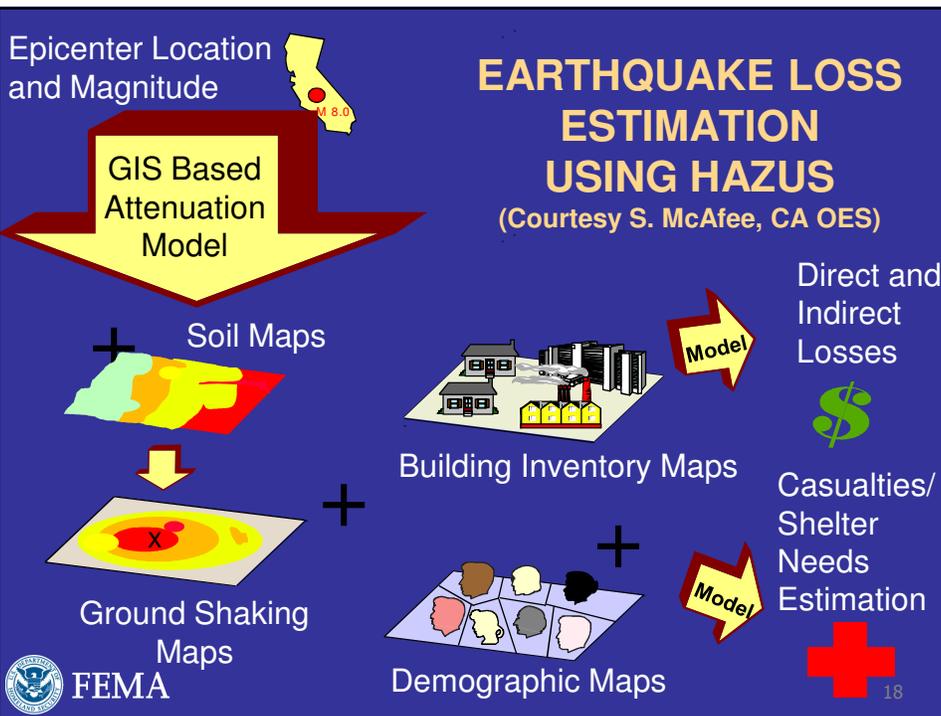
HAZUS-MH Outputs

	Earthquake Ground Shaking Ground Failure	Flood Frequency Depth Discharge Velocity	Hurricane Wind Pressure Missile Rain
Direct Damage			
General Building Stock	✓	✓	✓
Essential Facilities	✓	✓	✓
High Potential Loss Facilities	✓	✓	✓
Transportation Systems	✓	✓	✓
Utility Systems	✓	✓	✓
Induced Damage			
Fire Following	✓		✓
Hazardous Materials Release	✓		✓
Debris Generation	✓	✓	✓
Direct Losses			
Cost of Repair	✓	✓	✓
Income Loss	✓	✓	✓
Crop Damage	✓	✓	✓
Casualties	✓	Generic Output	✓
Shelter Needs	✓	✓	✓
Indirect Losses			
Supply Shortages	✓	✓	
Sales Decline	✓	✓	
Opportunity Costs	✓	✓	
Economic Loss	✓	✓	

Levels of Analysis

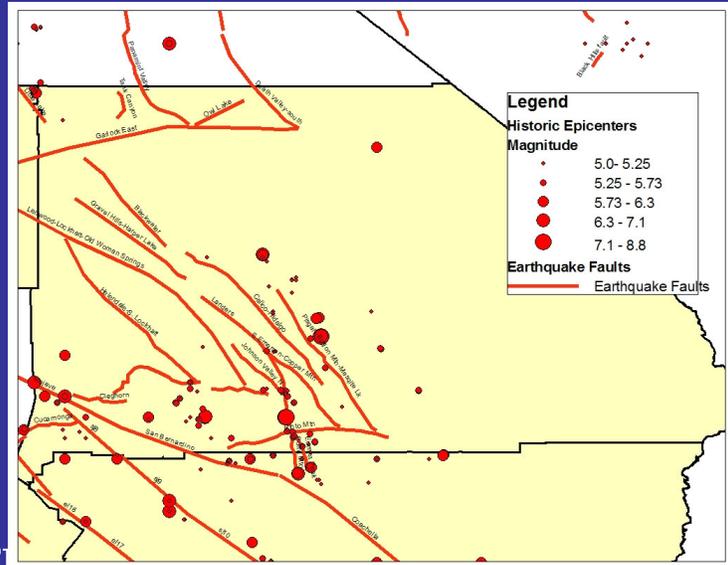


17



18

San Bernardino County Faults in HAZUS



FEMA

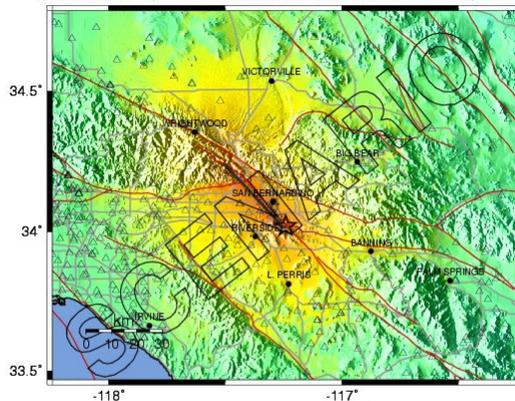
19

GROUND SHAKING MAPS & DATA

ShakeMaps available for So. Cal. From the USGS –

SCENARIO EARTHQUAKES

-- Earthquake Planning Scenario --
Rapid Instrumental Intensity Map for San Jacinto M6.7 Scenario
Scenario Date: Fri Sep 14, 2001 07:00:00 AM PDT M 6.7 N34.02 W117.24 Depth: 10.0km



PLANNING SCENARIO ONLY -- Processed: Mon Jan 23, 2006 05:06:42 PM PST

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-37	37-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



FEMA

<http://www.cisn.org/shakemap/sc/shake/>

Digital FIRM



Base Map

+



Flood Data

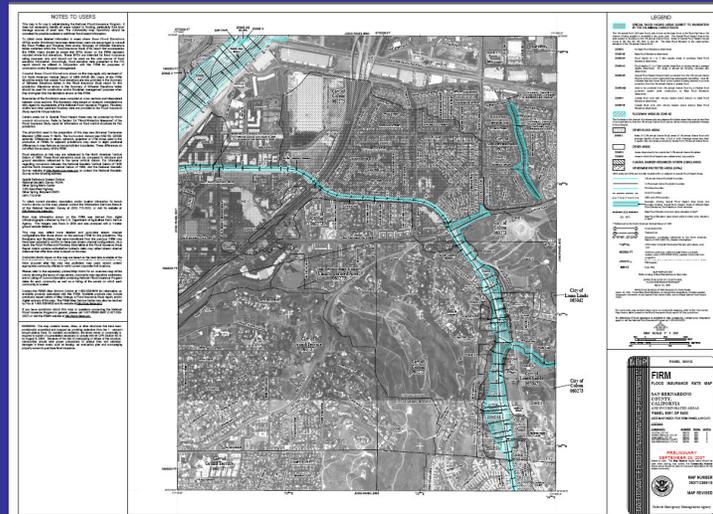
=



Digital FIRM



Current FIRM (September 28, 2007)



HAZUS-MH Default Inventory Data

Default inventory data includes:

- “General building stock” - proxy representation of all buildings in the U.S.
- Essential facilities* – hospitals, schools, etc.
- Transportation lifelines* – highway, railway, etc.
- Utility Lifelines* – water, power, gas, etc.
- Demographics
- Economic values

* In some cases, default data may be limited or unavailable



FEMA

23

Inventory Data

- Essential Facilities inventory data is stored two ways:
 - Data common to all hazards
 - Address
 - Geographic Location
 - Contact Info, etc.
 - Hazard-specific data
 - EQ – model building type, quality, design level, site-specific EQ hazard data
 - Flood – Pre-FIRM/Post-FIRM, foundation type, first floor elevation, flood protection



FEMA

25

Data Sharing

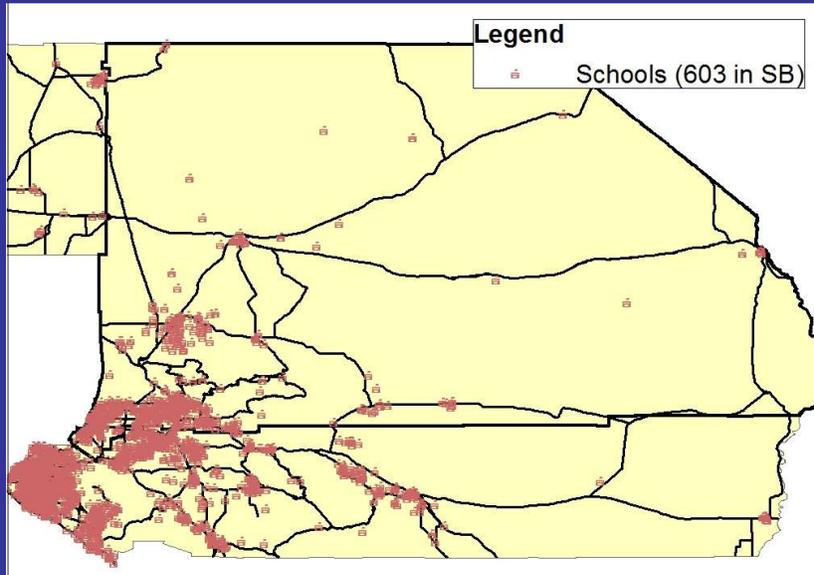


We need the Community's help...

- In order to make the San Bernardino County Risk Assessment more reliable and its products more useful, we need the help of the County and its communities in updating the default essential facilities data in HAZUS...



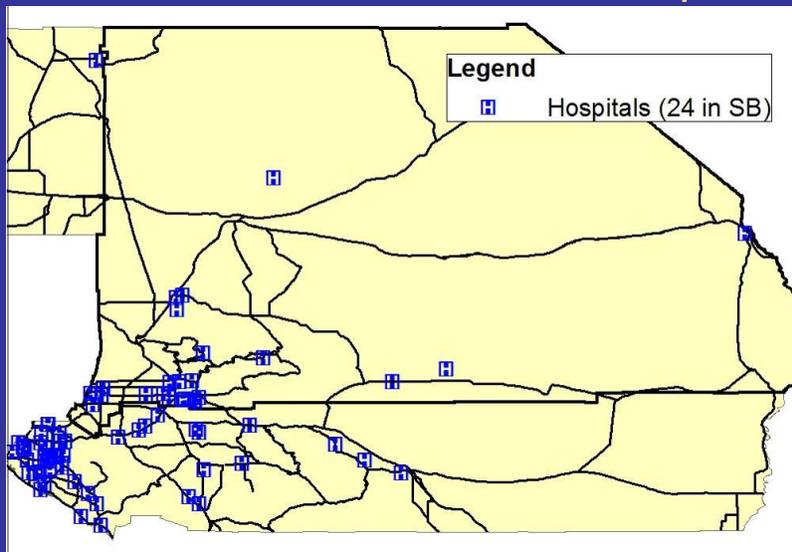
HAZUS Default data for Schools



FEMA

30

HAZUS Default data for Hospitals



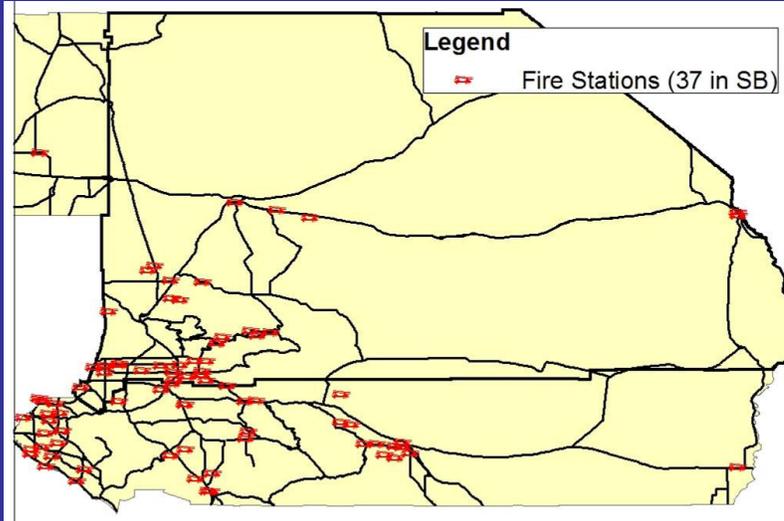
FEMA

31

HAZUS Default data for Fire Facilities

Note:
HAZUS
default
data often
identifies
Main Fire
Dept.
facility
only...

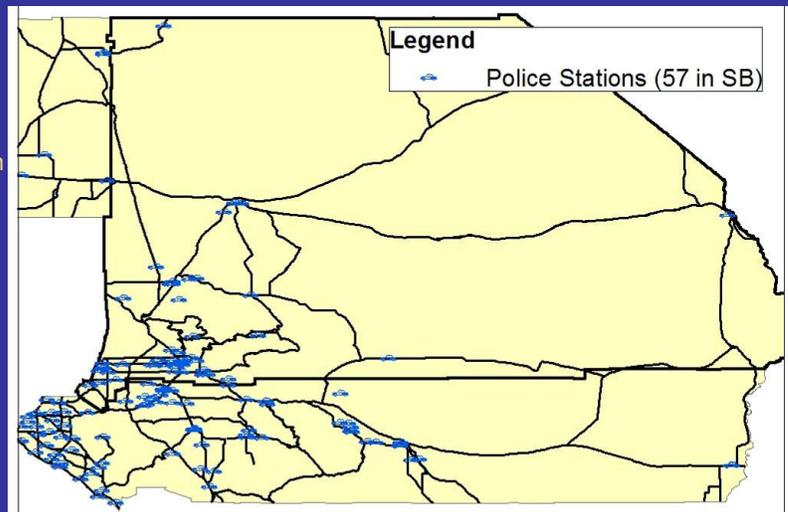
Update of
this data
set is
essential!



32

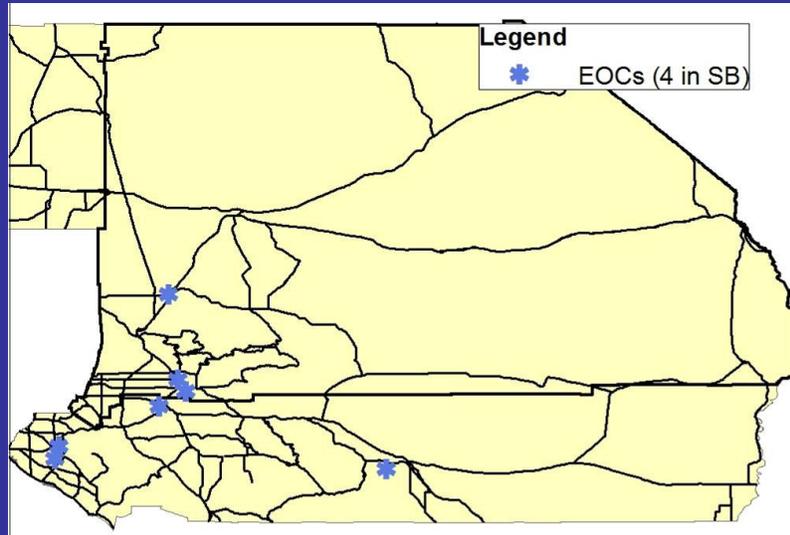
HAZUS Default Data for Police Facilities

Note:
HAZUS
default
data often
identifies
Main
Police
Dept.
facility
only...



33

HAZUS Default Data for EOCs



Project Phases

- 4 Phases:
 - 1 – Initial Coordination, Establishment of Community Exec. Committee, Identify points of contact
 - 2 - Data Collection & Review (*CEC meeting upon completion)
 - 3 - HAZUS Analyses - EQ & Flood (*CEC meeting upon completion)
 - 4 - Risk Assessment Report (*Community Roll-Out upon completion)

Next Steps

- All Coordination through San Bernardino County
- What we need from you
 - If you have an interest in participating in the CEC, please let Denise Benson, San Bernardino Co, know
 - Identify points of contact within cities/agencies for information updates and data collection. Ideally, this contact person should be someone with access to GIS or other facility information for your police stations, fire stations, EOCs, schools and/or hospitals. We will then send data sharing and review requests directly to these contacts
 - Help Acquiring the Assessor's data



FEMA

37

Questions & Discussion

- FEMA is excited to work with San Bernardino County on this important project, to blaze a new trail in emergency preparedness and risk assessment!
- This project has unlimited potential for future applications...this project is for you...
- Questions?



FEMA

38

Contact Information

- San Bernardino County Fire Department
Denise Benson, Division Manager, Office of Emergency Services
(909) 356-3998
dbenson@sbcfire.org
- FEMA Region IX
Raymond T. Lenaburg, Senior Engineer
(510) 627-7181
Raymond.Lenaburg@dhs.gov
- MAP-IX Mainland (Dewberry)
Stephanie Routh, Project Manager
(602) 943-1585
srouth@dewberry.com
- MAP-IX Mainland Consultant - MMI Engineering, Inc
Hope Seligson, Associate
(714) 465-1390
hseligson@mmiengineering.com



FEMA

See: www.sbcfire.org/oes/index.asp
for project documents, etc.

39