• California needs an ability to **survive** and **recover** from disaster

• This ability strongly depends on its capacity to maintain or quickly **restore** infrastructure operations

• Right now the State has **limited knowledge** of the overall **condition** of its infrastructure
Cal VIVA Purpose

• Develop a systematic approach to **prioritize infrastructure investments** based on vulnerability, continuity of operations and other key criteria

Start with **Seismic** Vulnerability of State-Owned Buildings **vital** for response and recovery

Cal VIVA I, II & III- NEHRP/FEMA/CAL OES
California has over 24,000 State-Owned Buildings

13,000 in areas of High Seismicity

US5HZ050
Polygon coverage of 0.2 second spectral acceleration with 10% probability of exceedance in 50 years (same attributes as US1HZ050) (Source: OFR-97-0131)
Cal VIVA Process

1. Create a methodology to determine the seismic vulnerability of a group of buildings
2. Develop a prioritization method to mitigate those vulnerabilities
3. Disseminate the information
1. Create a methodology to determine the seismic vulnerability of a group of buildings
1. Create a methodology to determine the seismic vulnerability

**3 Triggers**

1. Function
   - Vital to Response & Recovery

2. Location
   - Site
   - Seismicity

3. Building Vulnerability
   - Structural System
Using these 3 Triggers
Performed 19 Building Assessments
4 Departments
Challenges

• FUNCTION
  – Planning for response and recovery is a work in process

• BUILDING VULNERABILITY
  – Lack of documentation of building construction complicated assessments
  – Site hazards were uncovered that may affect the buildings performance
2. Develop a prioritization method to mitigate the seismic vulnerability
2. Develop a prioritization method to mitigate seismic vulnerability

A. Develop and cost conceptual mitigations for vulnerable buildings

B. Prioritize the mitigations based on the specific Department mission and needs

C. Create a Department Mitigation Plan
Cal VIVA Test
Agency/Department Plan

Caltrans Division of Maintenance
1321 Facilities
Vital Caltrans Maintenance Facilities

Process identified 156 Critical Facilities in areas of high seismicity.

Caltrans next steps is to determine age and structural type.

With that information they can create an assessment program and with results a prioritization plan.
Challenges

Cal VIVA identified distinct department differences in their building stock and resiliency. Due to the differing missions their prioritization goals varied.
3. Disseminate the information

Currently mitigations are done at the department level

Memorial Stadium Renovations UC Berkley
3. Disseminate the information

State Reporting Plan Framework

State Overview
Delivered
5 years
SHMP

1

Statewide Database
Summary of Individual Assessments

2

Agency/Department Level
Department Plans & Individual Reports

3
Conclusions

Cal VIVA methodology is valid

• defines the extent of the seismic vulnerabilities,
• prioritizes improvements,
• identifies needed resources for reducing those vulnerabilities
• monitors progress
Next Steps

• Implementation must overcome significant challenges
  – All concerned agree it is a needed project but it is not their primary mission
  – The assessment and prioritization process requires a significant investment of staff time and specialized knowledge
  – Mitigation requires substantial outlay of capital funds
Next Steps

California Office of Emergency Services believes in the project and is working to locate needed resources.
Questions
Increasing the resiliency of the state is a goal for all Californians

Utilizing the Cal VIVA methodology and working together we can improve our knowledge, work to secure funding and systematically reduce the seismic vulnerability of California

THANK YOU
1. Create a methodology to determine the seismic vulnerability

Basis: ASCE 31-03

Recognized Source

3 level system allowed for simple and complex buildings types
Agenda

• Purpose
• Process
• Conclusions
• Questions