

## Seattle Fault Earthquake Scenario

Conference

February 28, 2005







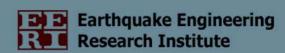














#### **Introductions**

Don Ballantyne, P.E. ABS Consulting, Inc.





### **Project Oversight Committee**

- Donald Ballantyne, PE ABS Consulting
- Stacy Bartoletti, PÉ, SE Degenkolb Engineers
- Susan Chang, PhD, PE Shannon & Wilson
- Barb Graff City of Bellevue
- Greg MacRae, PhD, PE University of Washington
- Jacqueline Meszaros, PhD University of Washington/ NSF
- Ines Pearce City of Seattle
- Mark Pierepiekarz, PE, SE MRP Associates
- Jane Preuss, AICP Planwest Partners
- Mark Stewart Washington State Emergency Management Division
- David Swanson, PE, ŠE Reid Middleton, Inc.





### **Scenario**

- Magnitude 6.7 earthquake
- Seattle Fault
- Epicenter at Harbor Island, moving easterly 14 miles
- 6.5-foot offset

#### **Scenario Results**

- Dead 1600
- Destruction \$33 Billion
- Downtime months to years



#### **Study Area**

- King County focusing on Seattle and Bellevue
- Pierce and Snohomish Counties
- Study area includes over half the state's population, and 6 of the 10 largest cities.
- King County has 44 % of the jobs state wide



### **Earthquake Risk**

- Washington has the 2<sup>nd</sup> highest risk in the US
- Deep Earthquakes 1949, 1965, 2001 – Nisqually
- Cascadia Subduction 7 over 3500 years, the last one in January, 1700
- Crustal M7.3 on the Seattle Fault 1100 years ago, 7 meter offset

#### **Scenario Earthquake**

- Seattle Fault presents the highest risk to the region
- M6.7 likely event on that fault, as demonstrated by trenching in Bellevue
- Many of the vulnerabilities in this scenario are also manifested in other earthquakes: other crustal, the subduction, and large deep events.

### **Scenario Objective**

- Establish a baseline.
- Bring stakeholders to the table to ask:
- Are the risks acceptable?
- And if not, what action shall we take?



# Introducing the Seattle Fault Earthquake Scenario

Craig Comartin, S.E.

Earthquake Engineering Research Institute





#### **Tool and Resources**

- Draw on existing information
- Use HAZUS to provide an overview
- Seismology from the USGS
- Geology from the WSDNR and USGS
- Use GIS to relate hazards to the infrastructure
- Multidisciplinary team scientists, geologists, engineers, emergency response professionals, economists, social scientists – most that have been involved in the regional earthquake community



#### **Limitations**

- Scenario not a detailed risk or vulnerability study
- Intent to provide a regional perspective of the risk, not to focus on any single system or owner
- Comprehensive, but not exhaustive; did not evaluate:
  - Aftershocks
  - Tsunamis
  - Fire following



## Integrated — People, Facilities, and Systems

- Regional transportation system
  - Bridges are just a component of the highway segments that are designed to get us from Point A to B
  - Highways are only one component of the overall regional transportation system that includes ports, ferries, and airports.
- Emergency response and recovery is dependent on integrated systems
  - Transportation, electrical power, hospitals
- Study participants "worked across traditional boundaries"



## Document Availability and Follow-up

- Hardcopy by end of March
- Available at the EERI web site by mid-March
  - http://seattlescenario.eeri.org/
- Interest in future participation
  - EERI web site questionnaire



#### **Call to Action**

- 1.Establish an independent state seismic safety board or commission.
- 2.Implement risk reduction plans for critical public facilities.
- 3. Retrofit high risk buildings.
- 4. Protect the transportation infrastructure.



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