Status Report on BART Earthquake Safety Program

Seismic Safety Commission Meeting

September 12, 2013

Presentation Overview

- History of BART
- Earthquakes in the Bay Area
- BART's Earthquake Safety Program
- Studies Completed
- System Vulnerabilities and Potential Impacts
- Priorities, Costs and Schedules
- Completed Activities
- On-going Work

EARTHQUAKE SAFETY PROGRAM
BUILDING A STRONGER SYSTEM

BART – a Regional Response

Section of BART's Transbay Tube Under Construction

"If the Bay Area is to be preserved as a fine place to live and work, a regional rapid transit system is essential to prevent total dependence on automobiles and freeways."

-San Francisco Bay Area Rapid Transit Commission, 1951

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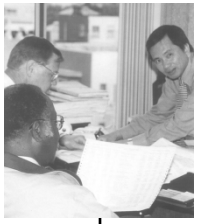
BART's Past



1946

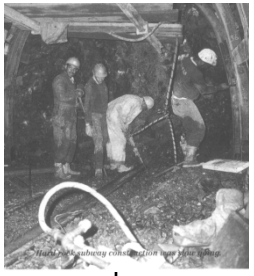
Discussions Begin

1957

BART District Created

1962

Voters Approve BART Plan



1964

Construction Begins

1970

BART Car Prototype Created

1972

BART Carries First Passenger

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BART Today

5 Lines

104 Miles (167 Km)

- Underground = 37 Miles (60 Km)
- Aerial = 23 Miles (37 Km)
- Surface = 44 Miles (71 Km)

43 Stations

385,000 Daily Ridership

$20 Billion Replacement Cost

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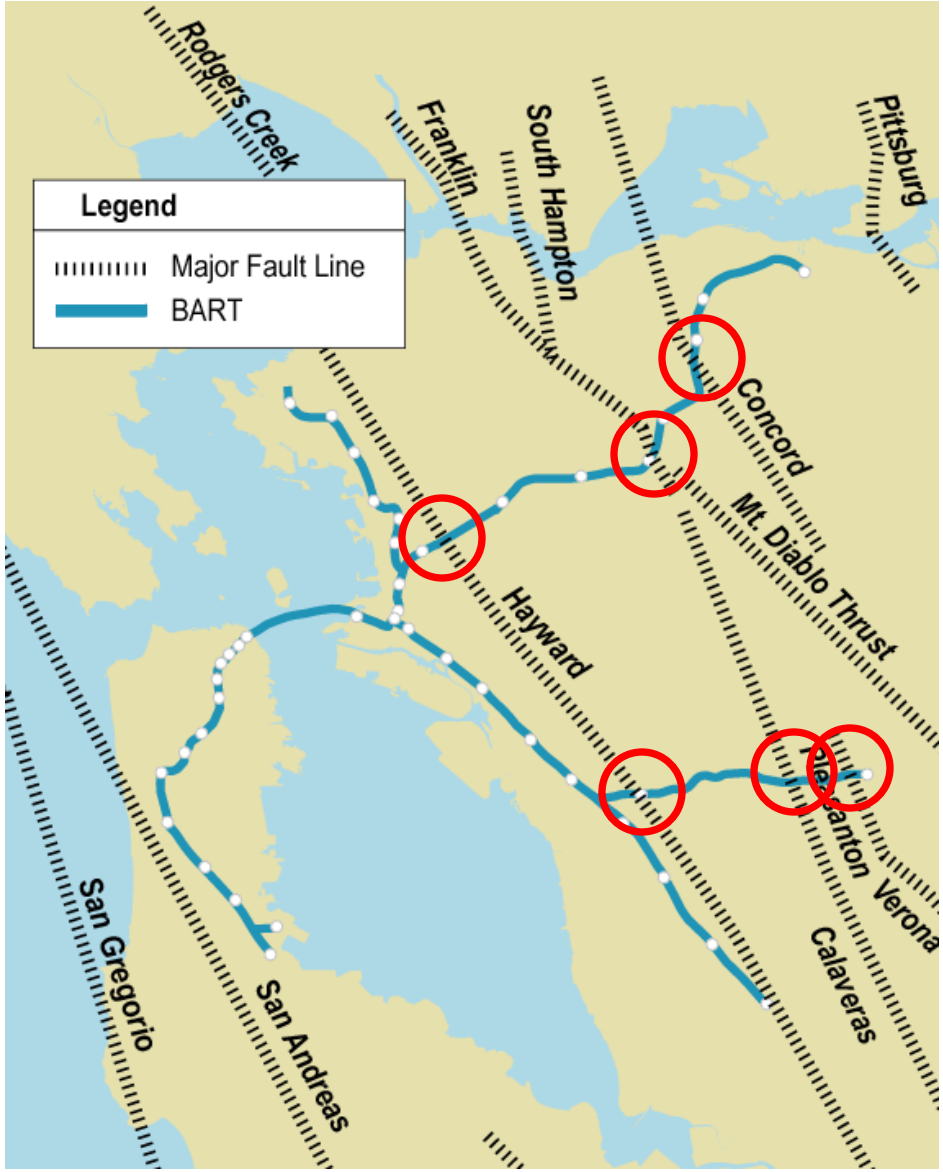
Keeping the Bay Area Moving

A Vital Transportation Link

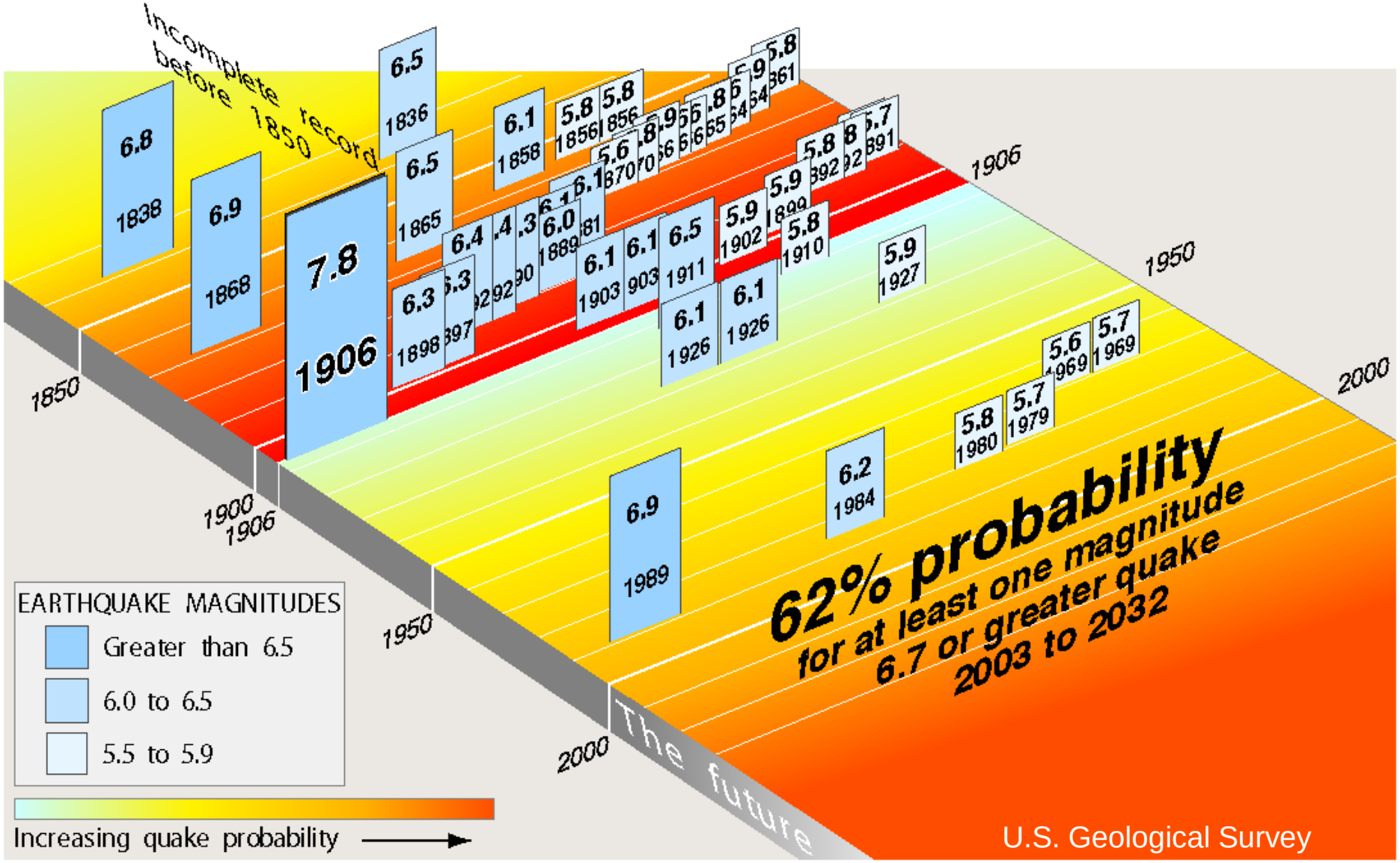
- 385,000 Weekday Ridership
- Approx. Half of Rides Cross Bay
- During Peak Commute, BART Carries as Many People as the Bay Bridge
- 30 Million Trips/Year to or from Contra Costa County
- 75 Million Trips/Year to or from Alameda County
- 50% Downtown Oakland Workers Commute on BART
- BART Riders Spend Ave. $450 Million on Retail in San Francisco Annually

Bay Area Faults and BART



- Hayward Fault parallel to BART and crosses BART.
- **1868** last major rupture of Hayward Fault (130- to170-year return cycle).
- Four earthquake scenarios most likely to damage BART:
  - 7.0 Hayward Fault
  - 8.0 San Andreas Fault
  - 6.7 Concord Fault
  - 6.7 Calaveras Fault

Increasing Earthquake Probability



U.S. Geological Survey

1989 Loma Prieta Earthquake

Bay Bridge

- San Andreas Fault – 60 Miles South of Bay Area
- One Month Without Bay Bridge
- BART Performance Excellent
- Daily Ridership Increased from 218,000 to 350,000
- Critical Support of the Economy
- Transport of Urgent Supplies

Photo by C.E. Meyer, U.S. Geological Survey

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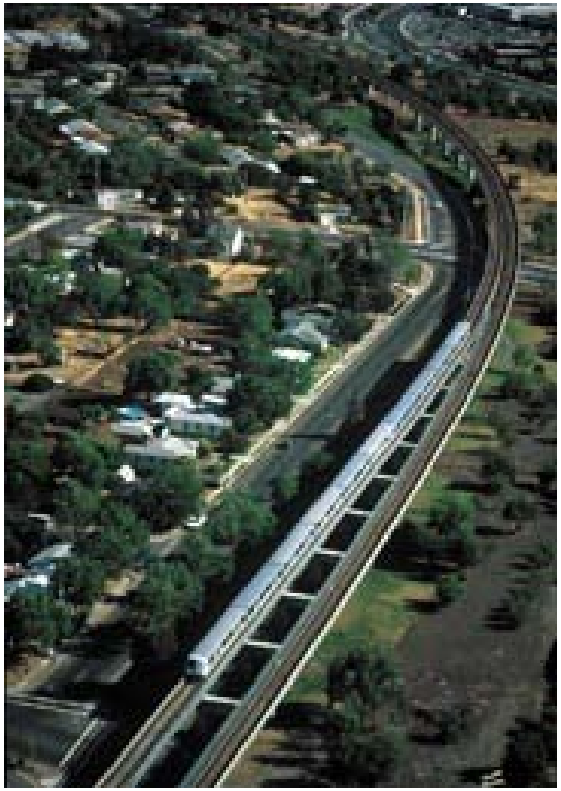
BART's Earthquake Safety Program



- 1989 Loma Prieta EQ (centered 60 miles from SF)
- Began with Vulnerability Study of the Existing System 2002
- Identified Most Cost-Effective Retrofits based on Impacts to Riders and Bay Area Economy
- Successful 2004 Bond Campaign ($980M) with SSC Support!

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Vulnerability Study Findings

Potential Service and Traffic Impacts

- Portions of BART Could Be Closed for Repair for 2.5 Years or Longer
- 385,000 More Trips Competing for Space on a Damaged Roadway System
- During Peak, Additional 60 to 90 Minutes Commute Delay along Major Corridors

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Vulnerability Study Findings

Potential Life Safety Issues

Primary Vulnerabilities

- Transbay Tube – Critical Link in System
- Aerial Guideways – Located Throughout System
- Stations