

Advances in Early Warning

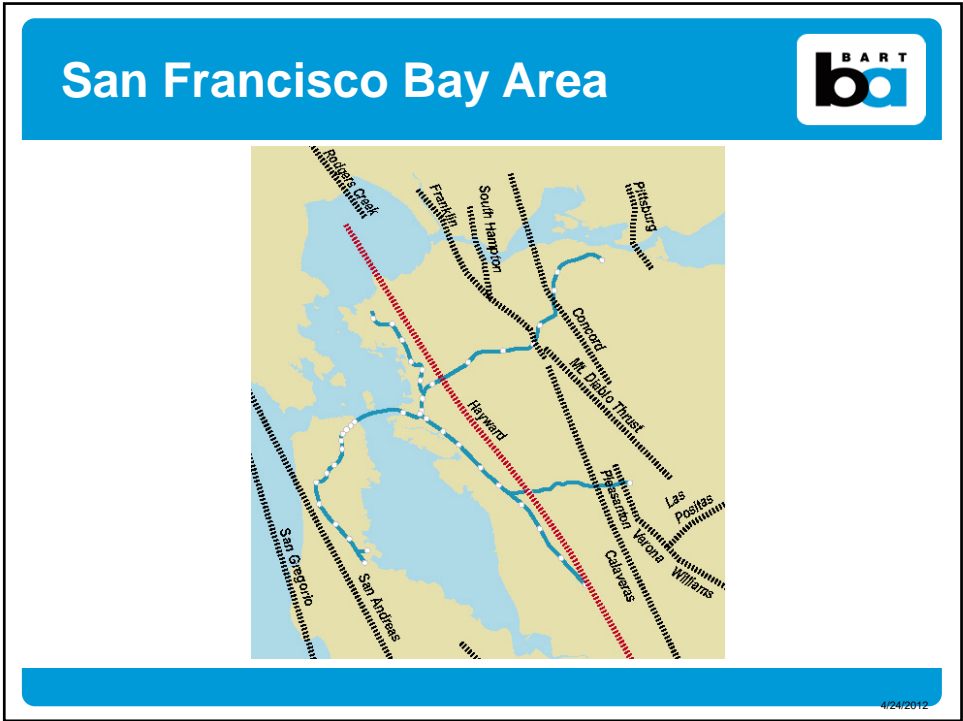
EERI Annual Meeting & National Earthquake Conference

John McPartland, President BART Board of Directors
Location: Memphis, Tennessee
Date: April 12, 2012

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EQEW + BART = MCI – CA

Earthquake Early Warning + BART =
Mass Casualty Incident – Catastrophe Avoidance

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Defining the Equation:

$$EQEW + BART = MCI - CA$$

Earthquake Early Warning = Seismic Advanced Notice

BART = Bay Area Rapid Transit

Mass Casualty Incident=More Patients Than Rescuers

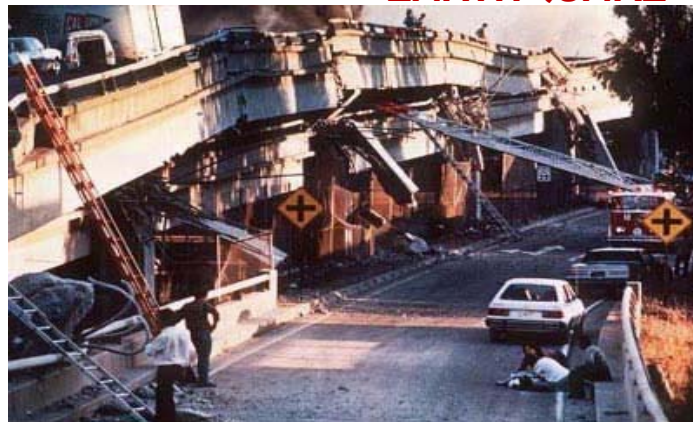
Catastrophe=Disaster with Infrastructure Collapse

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MCI EXAMPLE: 1989 LOMA PRIETA EARTHQUAKE

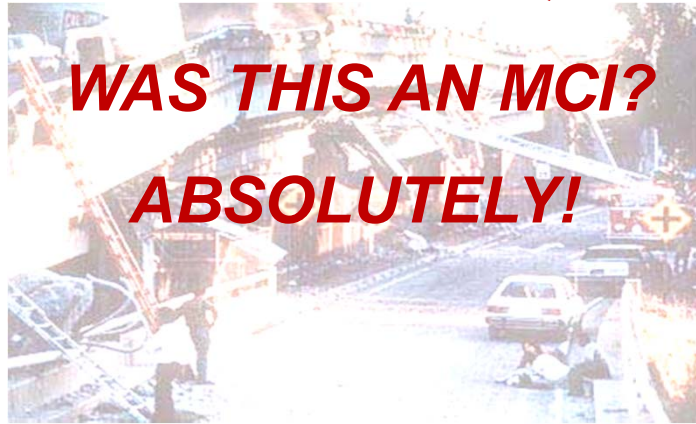


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MCI EXAMPLE: 1989 LOMA PRIETA EARTHQUAKE



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CATASTROPHE EXAMPLE: 2005 HURRICANE KATRINA/SUPERDOME



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**CATASTROPHE 2005 HURRICANE
EXAMPLE: KATRINA/SUPERDOME**



**WAS THIS A
CATASTROPHE?
THIS WAS A MASS TRANSIT
AND PLANNING FAILURE.**

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CONSIDER THIS:

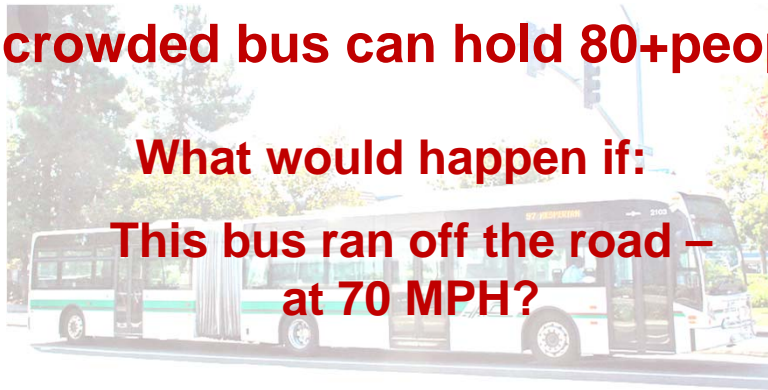


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CONSIDER THIS:

A crowded bus can hold 80+ people.



What would happen if:

This bus ran off the road —
at 70 MPH?

Crowded BART Car



CONSIDER THIS:

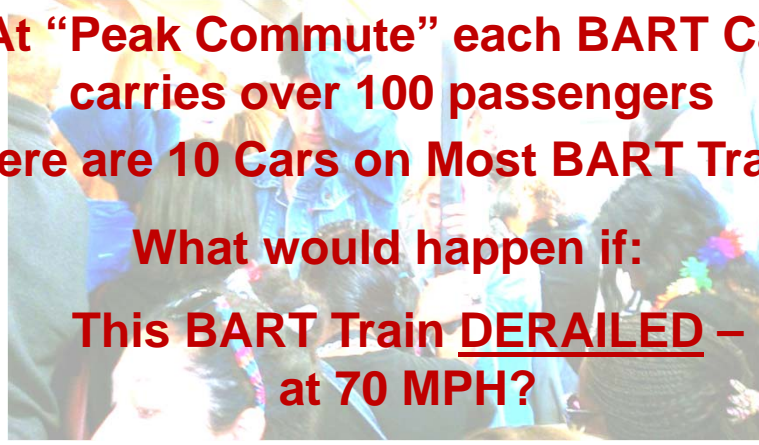


Crowded BART Car



CONSIDER THIS:

**At "Peak Commute" each BART Car carries over 100 passengers
There are 10 Cars on Most BART Trains**



**What would happen if:
This BART Train DERAILED –
at 70 MPH?**

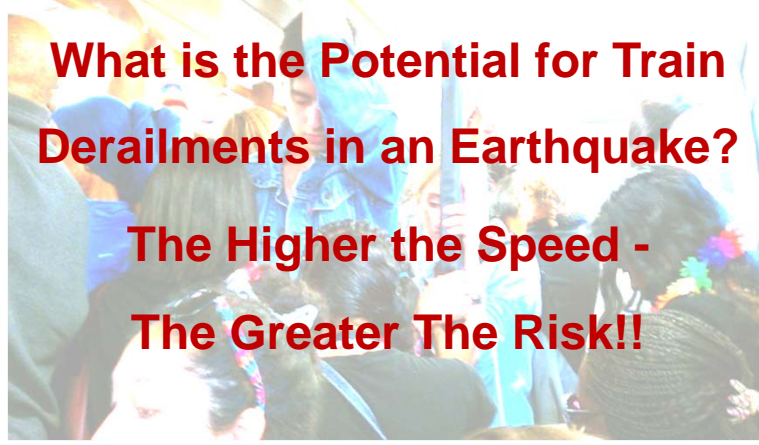
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Crowded BART Car



CONSIDER THIS:

**What is the Potential for Train
Derailments in an Earthquake?**



**The Higher the Speed -
The Greater The Risk!!**

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CONSIDER THIS:

Using EQEW, trains could begin braking seconds before strong shaking from a major EQ reaches BART.

**Slower Trains =
Lower Risk for Derailment**

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64 trains operating during peak commute

Of those: 40-45 trains traveling at 70 mph

How many trains will derail???

How many casualties from derailments?

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BART DERAILMENT POTENTIAL

Higher Velocities = Greater Risk for Derailment
Slower Trains = Lower Risk for Derailments

	Automatic Speed Reduction				Manually Activated (<i>Train Operator</i>) Emergency Stop Speed Reduction																				
	2 MPH/SEC				3 MPH/SEC																				
SPEED	70	68	66	64	61	58	55	52	49	46	43	40	37	34	31	28	25	22	19	16	13	10	7	4	1
TIME	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

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CONSIDER THIS:

**When the Next Major EQ Hits the SF Bay Area-
 Roads, Bridges, Infrastructure Are Compromised**

**What is the Value of a
 Mass Transit (Rail) System in a
 Catastrophic Disaster?**

**That Will Require A Resilient Rail
 System *and* NO DERAILMENTS**

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THE CHOICE IS OURS!

**We Have The EQEW
Technology and Disaster
Planning Tools!**

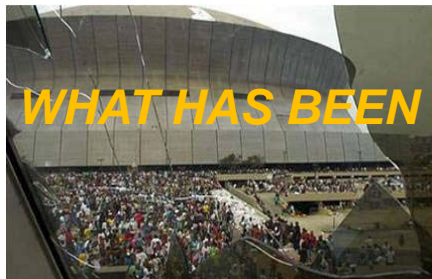
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***Superdome
Katrina 2005***

***Hayward Fault
Oracle Arena 20??***



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Earthquake Early Warning!

**What Can We Do With A Few
Seconds Warning?**

...As a Person

...As a Family

...In Our Business

...In Our Community

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PANEL DISCUSSION

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