

Airport and Infrastructure Resilience Project Overview

Dana Brechwald, Earthquake and Hazards Specialist

Lifeline Committee Meeting

May 8, 2014



earthquake and hazards program

Association of Bay Area Governments

Objectives for Our Study

Objective

- Gain a comprehensive understanding of the role Bay Area airports can play in long-term social, economic, and physical recovery from a disaster, given their vulnerabilities, interdependencies on regional infrastructure, and capacity for functioning following a disaster.

Goals

- Provide a general understanding of infrastructure hazard vulnerability and impacts of system interdependencies on restoration
- Develop a regional infrastructure vulnerability assessment at transmission scale
- Recognize the interdependencies in regional infrastructure systems and determine the organization capacity to restore services

Project Overview

Four Interrelated Projects

- Airport Liquefaction Susceptibility Analysis
- Role of Airports in Regional Disaster Response and Recovery
- ***Regional Infrastructure Vulnerabilities and Interdependencies***
- *Oakland Airport Focus Area Shoreline Resilience Planning (in partnership with BCDC)*

http://quake.abag.ca.gov/airport_resilience/

Project Timeline

Airport Liquefaction Susceptibility Analysis
June 2012 – May 2013

Role of Airports in Regional Disaster Response and
Recovery
June 2012 – May 2013

Regional Infrastructure Vulnerabilities and
Interdependencies *and* Oakland Airport Focus Area
Shoreline Resilience Planning (in partnership with BCDC)
June 2013 – September 2014

June 2013 - Aug 2013

June 2013 - Feb 2014

Dec 2013 - May 2014

May 2014 - Sept 2014

Phase 1: Research and Background

- Refine Infrastructure and Hazard Categories
- Assemble data wish list
- Identify potential interviewees

Phase 2: Data Gathering

- *Collect Data on Infrastructure*
- *Examine Earthquake and Regional Case Studies*
- *Conduct analysis*
- *Generate GIS Maps*
- Develop Interview Questions and Tools
- *Conduct Interviews*

Phase 3: Data Synthesis and Analysis

- *Develop Vulnerability Inventory*
- *Synthesize Interview responses*
- Develop Diagrams, Tables and Charts
- *Write Interdependencies Findings Report*

Phase 4: Confirm and Report

- Check findings with stakeholders
- Craft Mitigation Recommendations
- Finalize Report

Interviews to date: Who we've met with

- PG&E
- EBMUD
- BART
- SFO
- OAK

Interviews to date: What we heard

- **Data sensitivity**

- There are still big concerns about sensitive information – bridging the 30,000 foot view with on-the-ground knowledge
- Control of data release
- Disconnect between our big questions and requests for specific pieces of information
- It might be helpful to have more closed sessions with providers

Interviews to date: What we heard

- **Understanding standards**
 - Can understand the world of regulations and standards, but what does it mean?
 - Different standards for private vs. public
 - No standards for disaster performance
 - Wide variation in vulnerability assessments, assumptions about operability
 - Incident command is really unevenly implemented

Interviews to date: What we heard

- **Miscellaneous concerns**
 - Secondary hazards such as fire
 - Fuel is still a big issue
 - Complicated fuel cycle in the Bay Area
 - Major internal communication issues
 - Concerns about getting people there to do the work
 - Lack of understanding about things: what does it mean to be a “priority?” And how do politics change this?
 - Heavy dependence on PG&E – can be difficult to know problem areas without knowing more about PG&E
 - Everyone is making assumptions, but no one is checking them (ex: BART and CalOES exercise)

Interviews to date: What we heard

- *What's in it for the utilities??*

Final Workshops

- 2 workshops – airport only, airport + utilities
- Goals of airport workshop
 - What do we want to know about airports?
 - Dependencies, redundancies
 - Level of planning for lifeline failure
 - Assumptions about lifelines used for planning
 - What do airports want to know?
 - Assumptions about status of lifelines after a disaster, based on identified vulnerabilities
 - Lifeline restoration challenges, timelines

Final Workshops

- Goals of airport + utilities workshop
 - What to airports want to know?
 - Assumptions about status of lifelines after a disaster, based on identified vulnerabilities
 - Lifeline restoration challenges, timelines
 - What do utilities want to know?
 - This is where the interdependencies conversation becomes really relevant
 - Set up next steps/further studies
 - ***What's in it for the utilities??***

Where do we think we're going next?

- Regional lifelines council – recommendation of SF Lifelines Council report – this is way bigger than ABAG
- Better define airport capability after a disaster
- Better define consequences of system disruption to airports
- Identify follow-on projects

The City & County of San Francisco

Lifelines Council

MISSION

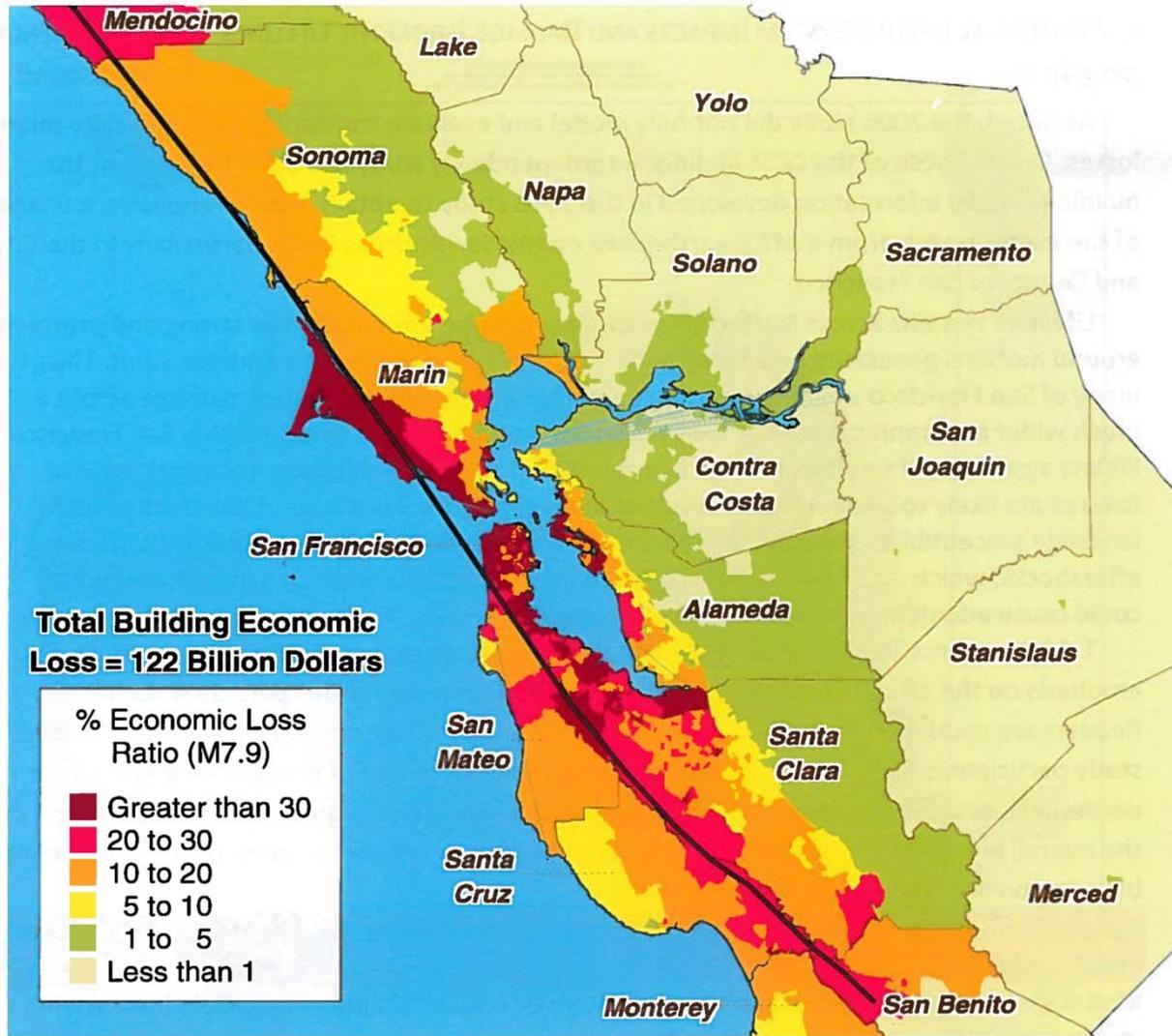
- Improve collaboration in the City and across the region,
- Understand inter-system dependencies to enhance restoration,
- Share information about recovery plans, projects, and priorities,
- Establish coordination processes for lifeline restoration and recovery following a major disaster event.

The City & County of San Francisco

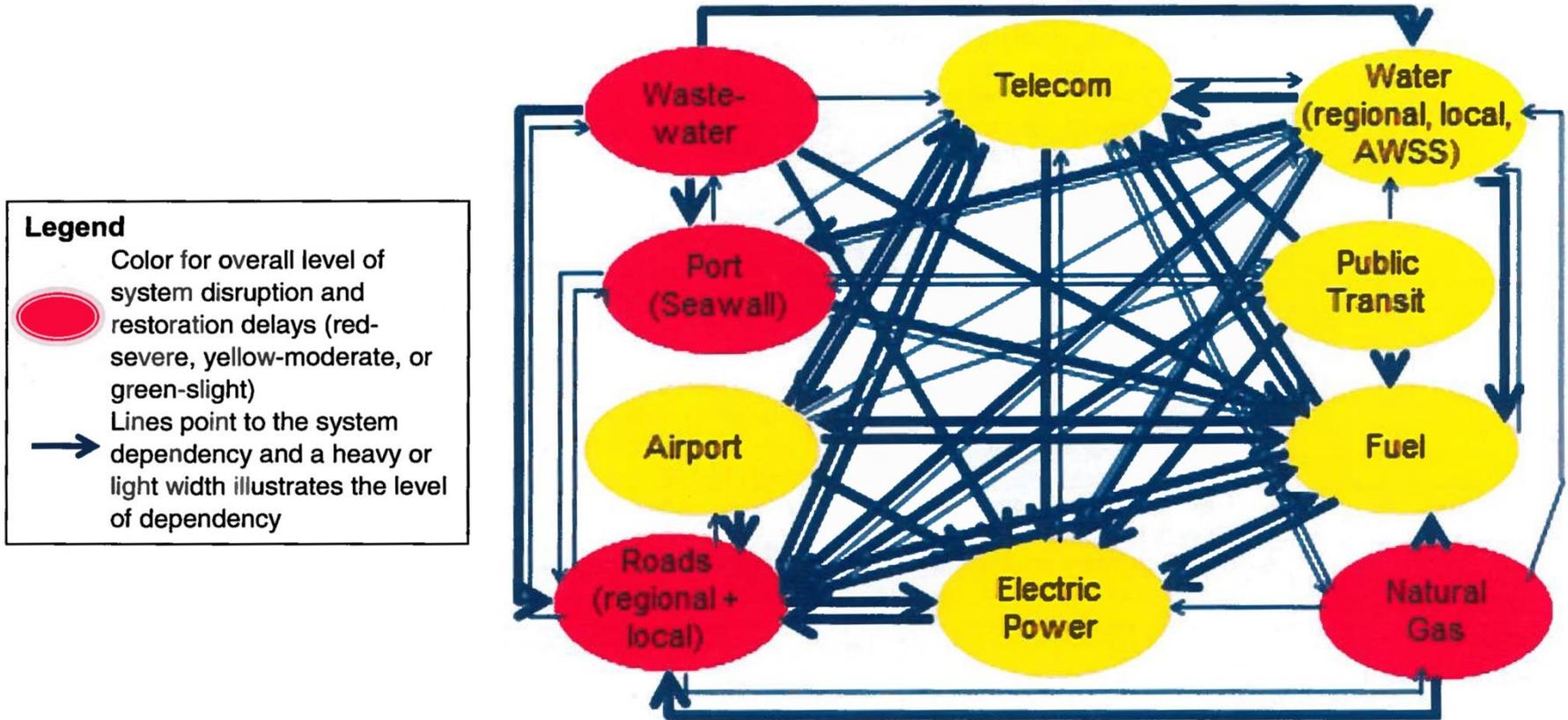
Lifeline Interdependencies Study

- Summaries of impacts to each lifeline
- Summaries of how risk has been managed in lifelines to date
- Restoration challenges
- Restoration timelines
- Lifeline interactions and dependencies, including type of dependency
- Governance snapshot – internal, county/city, state/region, and national decision-making
- Areas for detailed study

A single scenario was used for the study.



Interdependencies were abstractly defined.



All other systems are dependent on electric, telecom, and fuel.

The overall interaction and dependency on a particular system (read down each column)

	Regional Roads	City Streets	Electric Power	Natural Gas	Telecom	Water	Auxiliary Water	Waste-water	Transit	Port	Airport	Fuel
Regional Roads	General	Restoration Substitute	Restoration	Restoration	Restoration	Restoration		Restoration	Substitute		Restoration	Restoration
City Streets	Substitute, Restoration	General	Collocation, Restoration	Collocation, Substitute, Restoration	Collocation, Restoration		Restoration					
Electric Power	Restoration	Collocation, Restoration	General		Restoration	Collocation, Restoration	Collocation, Restoration	Collocation, Restoration		Collocation	Restoration	Restoration
Natural Gas	Restoration	Functional, Collocation, Restoration	Substitute	General	Restoration	Collocation, Restoration	Collocation, Restoration	Collocation, Restoration		Collocation	Restoration	Restoration
Telecom	Restoration	Collocation, Restoration	Functional, Restoration	Restoration	General	Collocation, Restoration	Collocation, Restoration	Collocation, Restoration			Restoration	Restoration
Water	Restoration	Restoration	Restoration		Restoration	General				Collocation		Restoration
Auxiliary Water	Restoration	Functional, Restoration	Restoration		Restoration	Functional, Restoration	General			Collocation, Restoration		Restoration
Waste-water	Restoration	Collocation, Restoration	Functional, Restoration		Restoration	Functional, Restoration		General		Collocation, Restoration		Restoration
Transit	Substitute, Restoration	Functional, Substitute, Collocation, Restoration	Functional, Restoration		Restoration	Collocation, Restoration	Collocation, Restoration	Collocation, Restoration	Collocation, General	Collocation, Restoration		Functional, Restoration
Port	Restoration	Collocation, Restoration	Collocation, Restoration		Collocation, Restoration	Collocation, Restoration	Collocation	Collocation	Collocation	General		Restoration
Airport	Restoration		Restoration		Restoration	Restoration		Restoration	Collocation, Restoration		General	Functional, Restoration
Fuel	Restoration	Restoration	Functional, Restoration		Restoration	Restoration				Restoration	Restoration	General

Lifetime operators' dependency on other lifeline systems (read across each row)

The City & County of San Francisco

Lifeline Interdependencies Study

April 17, 2014

NOTEABLE FINDINGS

- “Look for ways to integrate regional initiatives with other cities to synchronize lifeline restoration priorities,”
- “It is also recommended that a regional lifeline interdependency study be undertaken for the San Francisco Bay Area,”
- “Fuel is a major dependency,”