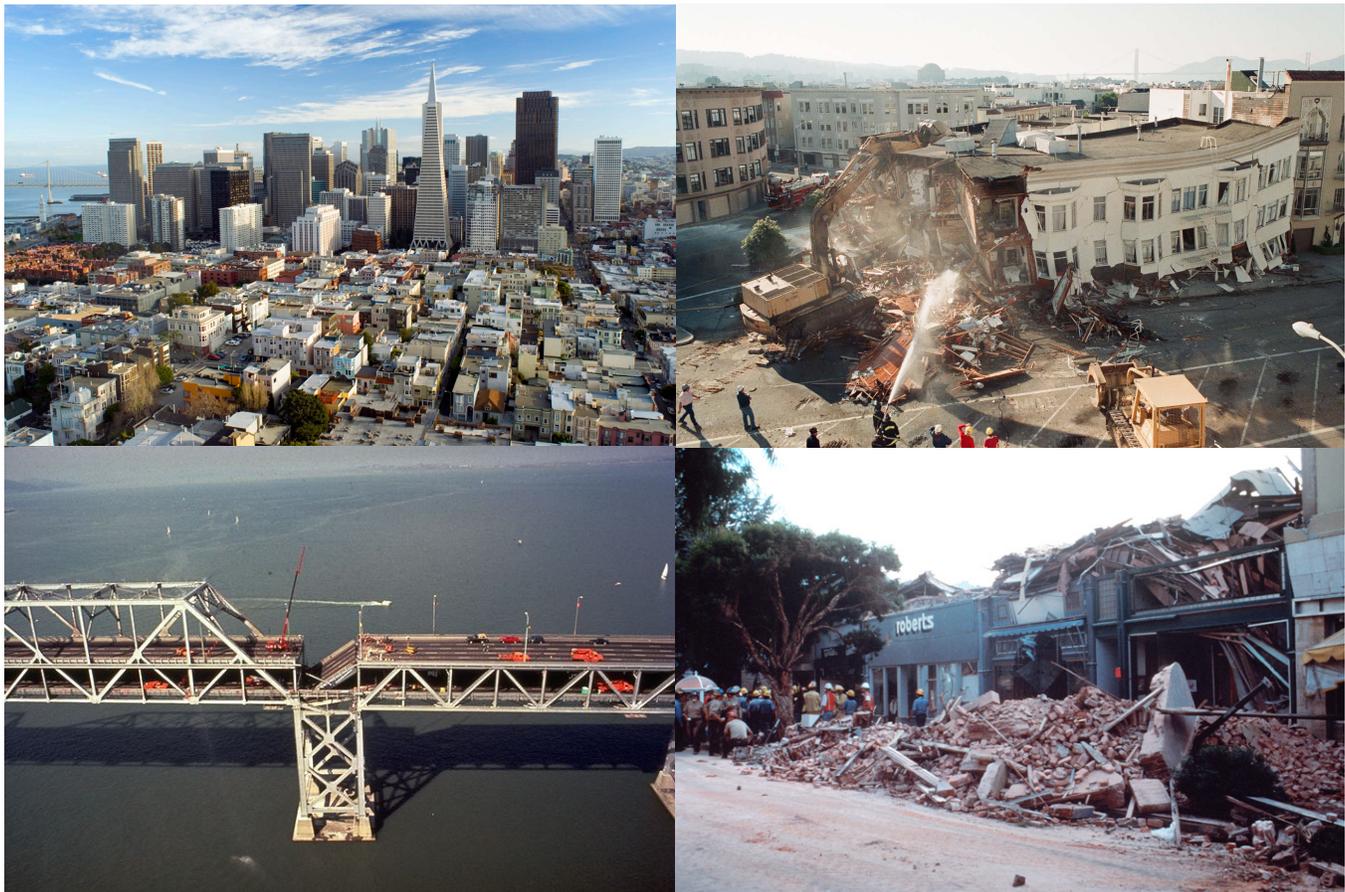

Regional Resilience Initiative



Introduction and Executive Summary

March 2013



Clockwise from top left: <http://www.freeimageslive.co.uk>; www.nbcnews.com; quake.abag.ca.gov; www.earthquake.usgs.gov

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A special thanks to all participants in our workshop series, who provided the basis for our Policy Papers.

Thanks also to our interviewees, who provided detailed input essential to the development of these papers:

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Resilience Initiative Overview

This document and the six papers that follow represent the culmination of the analysis phase of the Regional Resilience Initiative undertaken by the Association of Bay Area Governments (ABAG). The goal of ABAG's Regional Resilience Initiative is to develop a sustainable process through which stakeholders in the Bay Area can progressively build resilience through collaborative planning for long-term disaster recovery. Through the Initiative, we have identified sector-specific recovery issues that may require jurisdictional coordination and collaboration. We have sought to understand the current capacity of the region to implement a coordinated recovery around these issues, and identified recommended actions needed to improve this capacity. Our focus has largely been on planning for long-term recovery.

Disaster recovery, as in past disasters, can span decades. Anticipating post-disaster issues and acting now to support post-disaster recovery is essential. Communities can work in concert with mitigation and disaster response initiatives to create a more sustainable and resilient region—one that has the ability to prepare and plan for adverse events, absorb and recover from their impacts and successfully adapt in the face of change.¹

Building disaster resilience is an on-going, dynamic process where we seek to continually improve our capacity to respond to and recover from natural disasters. We also recognize that disaster resilient regions must be socially, economically, and environmentally resilient and that resilient regions are composed of resilient individuals, organizations, and communities.

To facilitate an effective and coordinated regional recovery from disasters, local governments, special districts, and regional, state and the federal government must come together in collaboration with key actors, such as businesses, nonprofit institutions, community leaders, and infrastructure agencies to determine responsibilities and decision-making structures.

¹ Adapted from *Disaster Resilience: A National Imperative*. National Academies of Engineering, 2012.

While regional governance structures for coordination are well-established for disaster response, developing regional governance for long-term recovery is needed for large-scale disasters because:

- A common vision for regional recovery will instill investment confidence in residents, businesses and the larger global community that the Bay Area will recover;
- Damage to regional infrastructure systems will require coordinated and prioritized decision-making about restoration and reconstruction;
- Many cities will simultaneously face similar decisions about rebuilding housing, restoring business and financing restoration. Crafting consistent and effective practices and leveraging mutual resources can facilitate a more uniform recovery across the region;
- A coordinated regional recovery will further existing goals for a more sustainable, equitable and prosperous region.

A major Bay Area earthquake will leave lasting impacts on our region, altering our built environment, economy, and many other characteristics that make the Bay Area unique. How will Bay Area leaders work together to plan for and address the impacts? Who are the major players in this work? How will cities and counties come together with business, nonprofit, and community partners to rebuild our region and restore our economy? What is the message and image we will send to the outside world after an earthquake? Will it be one of competition for limited resources or will we work together in the interest of the entire region and collectively advocate for our common needs? How will priorities be set?

Stakeholders indicate that a financing strategy to address rebuilding of the Bay Area's economy, infrastructure and housing is a regional necessity. In addition, advocacy for state and federal funding, along with needed legislative and

How will Bay Area leaders work together to plan for and address the impacts of a major Bay Area Earthquake?

regulatory authority could be successfully crafted through an inclusive process. How we come together as a region to grapple with these questions and build regional resilience is the focus of these papers.

The papers are organized around the four Policy topics that emerged from our process: Governance, Housing, Infrastructure, and Economy and Business.

Governance

Recommendations from ABAG's Regional Resilience Initiative interview process confirm both the research and workshop findings that regional coordination and decision-making can speed disaster recovery and improve resilience if accomplished prior to the event. There is region-wide agreement that crises are the worst time to come together to craft public policy. Though many small and large cities make up the region, we are one economy, with shared physical and social systems. Environmental issues and regulations cut across jurisdictions and require coordination among levels of government and agencies well before these systems are disrupted. More than half of the Bay Area residents cross county lines to commute to work, making housing workers a regional concern.² Many assets are regional, including our transportation, power, sewer, water and communications systems.

The overarching goal of the Governance paper is to develop forums for **regional communication and collaboration**. Our recommendation is to accomplish this through three goals – **create a regional resilience policy forum, develop regional resilience leaders, and use information and data analytics for disaster resilience**.

No regional coordinating body or disaster recovery framework is currently in operation to facilitate sharing and decision-making in the aftermath of a major disaster, although Federal Emergency Management Agency (FEMA)'s *National Disaster Recovery Framework* and California Emergency Management Agency (CalEMA)'s *Regional Emergency Coordination Plans* may provide guid-

² *The Bay Area Regional Economic Assessment. A Bay Area Council Economic Institute Report, October 2012.*

Governance Goals

- *Regional communication and collaboration*
- *Create a regional resilience policy forum*
- *Develop regional resilience leaders*
- *Use information and data analytics for disaster resilience*

ance on such a framework. Jurisdictions independently work their way through the FEMA regulatory system and make recovery decisions on their own, based on their current situation. The urgency for quick action and competing demands for time may inhibit decision-makers' awareness of and access to information about other actions occurring around the Bay Area, and knowledge about where building decisions fit within regional context. This can lead to fragmented recovery efforts and competition for federal funds. This is particularly an issue with the restoration and recovery of regional assets, such as infrastructure systems. A forum to help coordinate and guide jurisdictions within the region could not only speed restoration of regional services but expedite jurisdictional recovery as well, and ensure that the recovery process fits with larger regional goals for residents and businesses.

Helping staff and officials understand what may be asked of them before the disaster hits can help ensure that those involved have adequate powers and tools and are prepared for what they may be expected to contribute in the post-disaster recovery phase. Identifying champions or new types of professionals who deeply understand recovery needs and have the ability to move between departments and influence officials can also greatly assist recovery if they are given appropriate roles and forums to use their skills.

In addition, jurisdictions need many different types of information after a disaster. For example, local officials must have essential damage assessment information for utilities, government, and private sector organizations to assist with decisions about outages, damaged infrastruc-

ture, transportation disruptions, red-tagged buildings, and related debris and transportation issues. The same damage impact information can support decisions about long-term sheltering, temporary housing, and expedited disaster assistance. Information needs may range from information on individual buildings to a general picture of damage in other parts of the region.

Housing

One of the most seismically active regions in the country, California has developed strong building codes that will largely prevent loss of life in a major earthquake. These codes were developed over many decades and have been continually improved as earthquakes have demonstrated the need for new techniques and stricter codes. Still, these codes cannot guarantee that even a new building will be habitable or restorable after earthquakes, and many older buildings built before modern codes have not been upgraded and may need to be demolished due to extreme earthquake damage. The challenge for policy makers during the recovery framework is to maintain affordable housing while also improving the seismic resilience of existing housing so that quality affordable housing can survive an earthquake or other disaster.

The first goal of the Housing paper is to **facilitate rapid housing recovery that fulfills regional goals of enhanced quality of life**. Some disaster projections forecast the loss of more than 150,000 housing units across the region. One possibility is to focus replacement housing construction within Priority Development Areas (PDAs), locally-nominated and regionally-supported infill development opportunity areas within existing communities.³ PDAs are generally areas where there is local commitment to develop more housing along with amenities and services to meet the day-to-day needs of residents in a pedestrian-friendly environment served by transit. These qualities that make neighborhoods an enjoyable place to live also promote more resilient communities and supporting these services after an earthquake will be key to ensuring that residents

³ *Association of Bay Area Governments, FOCUS Program* <http://www.bayareavision.org/initiatives/prioritydevelopmentareas.html>

Housing Goals

- *Facilitate rapid housing recovery that fulfills regional goals of enhanced quality of life*
- *Promote housing mitigation to reduce housing loss and expedite recovery*

can remain in their homes.

The second goal is to **promote housing mitigation to reduce housing loss and expedite recovery**. Seismically vulnerable multi-family buildings pose particular challenges for local governments and are expected to account for two-thirds of housing losses.⁴ These buildings are not easy to identify and retrofits can be expensive, but the benefits of retrofitting are significant. Rebuilding multi-family housing post-earthquake is generally very slow, taking several years longer than for single-family homes and affordable units are often rebuilt above market rate, resulting in loss of affordable housing options. In some cities soft-story buildings are clustered together, creating potential for widespread loss of housing in concentrated areas.

Older single-family homes will likely account for nine percent of overall housing losses after each major earthquake.⁵ Single-family homes are generally relatively easy and affordable to retrofit. However, owners who embark on retrofit projects often quickly become perplexed by the lack of retrofit standards for some types of homes and the inconsistent array of retrofitting techniques proposed by contractors. Owners are further discouraged by the lack of incentive programs enjoyed by residents for energy retrofits. An estimated two-thirds of single-family retrofits are done improperly,⁶ a waste of homeowners' money that provides inadequate seismic benefits and

⁴ *Preventing the Nightmare (update), Association of Bay Area Governments, 2003.*

⁵ *ibid*

⁶ *Preventing the Nightmare: Technical Appendix B, Association of Bay Area Governments, 1999 and False Sense of Security, Contra Costa Times, 2006.*

Infrastructure Goals

- *Increase technical understanding of region-wide system vulnerabilities*
- *Increase ways to share risk information to collectively increase regional system resilience*

creates a false sense of security. Quality retrofits benefit not only homeowners and their families, but entire communities when they can get back on their feet faster after earthquakes.

Infrastructure

In the wake of a major disaster, the recovery of our major infrastructure systems will play a large role in our ability to recover quickly and effectively. Many recovery activities are highly dependent upon these systems. For example, the movement of goods - including supplies for rebuilding and daily goods and food for resuming daily lives - depends on a workable transportation system. People will not be able to stay in their homes if water and wastewater services are not available, and businesses will not be able to reopen. Repairing failed infrastructure systems and restoring their services are vital to the recovery of the Bay Area after a disaster, and failure to do so quickly and efficiently will result in widespread and long ranging, potentially devastating impacts.

The first goal of the infrastructure paper is to **increase technical understanding of region-wide system vulnerabilities**. Currently, few individuals understand how systems are interdependent. The knowledge that is available is largely based on speculation, not on rigorous analysis. The region needs peer-reviewed technical studies to better understand system vulnerabilities and what consequences may result from cascading failures.

The second goal is to **increase ways to share risk information to collectively increase regional system resilience**. To better understand interdependencies,

Economy and Business Goals

- *Retain big business*
- *Keep small and neighborhood serving businesses open*
- *Minimize supply chain disruption and keep goods moving*

we must improve sharing of risk information among service providers and regional stakeholders before a disaster occurs. We also have to participate in collaborative planning and accelerate mitigation. This sharing and collaboration is vital to an effective recovery. Communication and information sharing also allows for informed prioritization of infrastructure recovery. Understanding upstream and downstream interdependencies for repairs, as well as which systems key community resources rely upon, can be used to develop an appropriate timeline for streamlined recovery. Understanding priorities and system interdependencies allows providers to identify primary repairs to minimize interdependency and restore certain portions of systems quickly.

Economy and Business

The impact of an earthquake on the economy has one of the farthest-ranging implications for disaster recovery in the Bay Area. Without a swift and strong economic recovery, the Bay Area will suffer from a protracted recovery with slow repopulation in heavily damaged areas, slow rebuilding of homes and businesses, loss of revenue from business, tourism, and taxes, and the potential relocation of major industries. Estimates are that a repeat of the 1906 earthquake would cause \$120 billion in direct economic

building related losses.⁷ We have seen repeatedly in disasters that areas with the fastest economic recovery are those which already have strong economies and cultivate conditions to help businesses thrive before a disaster.

The Economy and Business paper identifies three post-disaster goals: **retain big business, keep small and neighborhood serving businesses open, and minimize supply chain disruption and keep goods moving.** The Bay Area regulatory environment, including zoning, permitting and environmental regulations may also inhibit businesses after a disaster, making it too difficult to stay or re-open. Businesses have identified a lack of consistency between regulatory agencies' policies at the local, regional and state level and commented that this situation limited their ability to expand within the region under normal business conditions.⁸ The challenges of post-disaster recovery will elicit calls for regulatory relief. With large volumes of rebuilding happening simultaneously, the capacity of regulatory agencies could potentially slow down the process.

Small and locally serving businesses remain an important component of a strong region and are especially vulnerable to closure after a disaster. An estimated twenty-five percent of small businesses do not re-open following severe disruptions from a major disaster.⁹ One reason why small businesses are so likely to fail is that they tend to operate with small profit margins and limited reserve funds, which means that even a short period without cash flow may have a significant impact on business. Small businesses also may not be eligible for SBA loans, which require businesses to demonstrate that loans can be repaid—a challenge when disasters disrupt business operations.

7 Kircher, Charles, et al, 2006. *When the Big One Strikes Again—Estimated Losses due to a Repeat of the 1906 San Francisco Earthquake. Earthquake Spectra, Volume 22, No. S2, pages S297–S339. Note: similar losses are expected for a Hayward fault scenario earthquake.*

8 *The Bay Area Regional Economic Assessment. A Bay Area Council Economic Institute Report, October 2012.*

9 *California Seismic Safety Commission, March 2012. Post-Disaster Rapid Economic Recovery Plan Project – Leading Practices and Potential Steps for a Rapid Post-Disaster Economic Recovery, Report by Deloitte Consulting.*

Other potential barriers to economic recovery include the disruption of vendors and supply chains to and from the region and the repercussions for national and international markets. Business disruption has upstream and downstream impacts on supply chains that can exacerbate impacts on the economy. For example, disruption of a manufacturing business may limit global supply of a particular product, disrupting the economy far beyond the impacted area. While the Bay Area's share of the manufacturing industry is not particularly concentrated, what is manufactured here is highly specialized and focused on sophisticated equipment design and development. Disruption of this specialized manufacturing could have global economic impacts.

Papers Structure and Format

This suite of papers seeks to provide a high-level analysis of the major goals for increasing resilience through a regional forum along with recommended actions for reaching these goals. The papers are structured into three general categories:

Theory—Resilience Background and Context

This paper provides the overall background and theory behind planning for resilience. It places disaster resilience planning in context with other types of resilience and sustainability efforts, particularly ongoing climate change planning and national resilience efforts. This paper also touches upon current state of disaster planning in the Bay Area and identifies major hazards of concern for the Bay Area.

Assessment—Regional Governance, Infrastructure, Housing, and Economy and Business Policy Papers

This suite of four papers examines the major issues of governance, infrastructure, housing, and economy and business. The four papers follow a similar format presenting significant goals for regional disaster recovery planning, and identifies regional actions that can be taken to address these issues. The regional decision-making paper serves as the foundation for the three other topic papers, as the goals and actions outlined there set the context for more easily

implementing sector-specific recommended actions.

Action—*Action Plan*

The action plan summarizes and prioritizes the actions identified in each of the four issue papers. The actions are analyzed for feasibility and include discussion of how to implement our recommended regional policy platform.

Methodology

The Regional Resilience Initiative was convened over an 18-month period. Stakeholder workshops were held throughout the process to solicit input on the major topic areas of housing, economy and business, including goods and services, and infrastructure. A final policy forum was held in October 2012 in conjunction with ABAG's Fall General Assembly, which focused on coordinated regional governance for long-term recovery and identified ways to increase shared understanding, opportunities for coordination, and tools for communication that will lead to regional strategies before an event that may improve the post-disaster recovery process.

In addition, the team conducted interviews in the summer of 2012 with key resilience stakeholders, thought leaders, and elected officials closely involved with exploring new public approaches on resilience. A complete list of our interviewees can be found on the credits page in the beginning of the suite of papers.

The work was also periodically reviewed by ABAG's Regional Planning Committee and will be formally adopted by ABAG's Executive Board in 2013. •