Regional Resilience Initiative
Overview and Summary Findings

Resilience Initiative Overview

This document and the six papers that follow represent the culmination of the 18-month Regional Resilience Initiative undertaken by the Association of Bay Area Governments (ABAG). The goal of ABAG's Resilience Initiative has been to develop a collaborative, 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, 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 we have seen in past disasters, can span decades. But anticipating post-disaster issues and acting now to expedite and 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 can absorb and minimize the impact of disasters, quickly return people to work, reopen businesses, and restore essential services needed for economic functionality after the event, while adapting and growing in the face of change.

Building disaster resilience is an on-going, dynamic process where we seek to continually improve our capacity to respond and recover from natural disasters. We also recognize that disaster resilience is just one component of a resilient region, which also includes social, economic, environmental resilience; and that resilient regions are composed of resilient individuals, organizations, and communities.

To facilitate an effective and coordinated regional recovery from disasters, coordination is needed to facilitate local governments to come together in collaboration with key actors, such as businesses, local governments, community leaders, major institutions, and infrastructure agencies to determine roles, responsibilities, and decision-making structures.

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

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

- A coordinated regional recovery will further existing goals for a more sustainable, equitable and prosperous region.

Executive Summary

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 regulatory could be successfully crafted through a consensus 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: Decision-Making, Housing, Infrastructure, and Economy and Business.

Decision-Making

Recommendations from ABAG's Regional Resilience interview process confirm both the research and workshop findings that regional coordination and decision-making can speed disaster recovery and improve resilience if accomplished before the unexpected occurs. 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.[1] Many assets are regional, including our transportation, power, sewer, water and communications systems.

The overarching goal of the Decision-Making paper is to achieve forums for **regional communication and collaboration**. Our recommendation for how 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 FEMA's National Disaster Recovery Framework and CalEMA's Regional Emergency Coordination Plans may provide guidance on such a framework. Jurisdictions independently work their way through 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, or

[1] *The Bay Area Regional Economic Assessment*. A Bay Area Council Economic Institute Report, October 2012.

where their rebuilding decisions fit within the regional agenda. 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.

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 impact information for utilities, government, and private sector organizations to assist with decisions about outages, damaged infrastructure, transportation disruptions, and related debris and transportation hazards 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 do not guarantee that even a new building will be inhabitable after earthquakes and many older buildings built before modern codes have not been upgraded. The challenge for policy makers is to address the present need to create and maintain affordable housing while also improving the seismic resilience of existing housing so that quality affordable housing can be maintained for the long-term

The first goal of the Housing paper is to **address regional goals of economic prosperity, environmental enhancement, and improved governance in housing recovery**. Priority Development Areas are locally-nominated and regionally-supported infill development opportunity areas within existing communities.[2] They 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 can remain in their homes.

The second goal is to **facilitate housing recovery through good policy, financing, and insurance**. Uninsured homeowners will present an unprecedented problem for policymakers at all levels of government in future earthquakes. Without financing options, residents will struggle to repair and rebuild their homes, delaying recovery of the region.

[2] Association of Bay Area Governments, FOCUS Program.
http://www.bayareavision.org/initiatives/prioritydevelopmentareas.html

The third goal is to **remove barriers to housing retrofit and replacement** for both **multi-family buildings** and **single-family homes**. Seismically vulnerable multi-family buildings pose particular challenges for local governments. These buildings are not easy to identify and retrofits are 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 where there is potential for widespread loss of housing in concentrated areas.

Older single-family homes will likely account for 9% of overall housing losses after each major earthquake.[3] 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 2/3 of single-family retrofits are done improperly,[4] a waste of homeowners' money that provides inadequate seismic benefits and 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, or not. 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 understand how systems are interdependent. What 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 we must improve risk information sharing 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 to develop an appropriate timeline for streamlined recovery.

[3] *Preventing the Nightmare* (update), Association of Bay Area Governments, 2003.
[4] *Preventing the Nightmare: Technical Appendix B*, Association of Bay Area Governments, 1999 and *False Sense of Security*, Contra Costa Times, 2006.

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, and loss of revenue from business, tourism, and taxes. Estimates are that a repeat of the 1906 earthquake would generate $120 billion in direct economic building related losses.[5] 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. Just as individuals who maintain a healthy lifestyle recover more quickly from illness, a strong economy has the potential to rebound quickly from an earthquake or natural disaster.

The Economy and Business paper has three 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 reopen. 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.[6] These challenges will likely be highlighted after an earthquake when large volumes of rebuilding happen simultaneously, potentially overwhelming the capacity of regulatory agencies and slowing 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 25% of small businesses do not re-open following severe disruptions from a major disaster.[7] 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.

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.

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[5] 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.

[6] *The Bay Area Regional Economic Assessment*. A Bay Area Council Economic Institute Report, October 2012.

[7] 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

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 Decision-Making, Infrastructure, Housing, and Economy and Business Policy Papers*

This suite of four papers examines the major issues of regional decision-making, 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 the 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 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 the 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 early 2013.

Regional Resilience Initiative Action Plan

Introduction

This paper consolidates the recommended actions identified through ABAG's Regional Resilience Initiative process and explored in detail in our Regional Decision-Making, Housing, Infrastructure, and Business and Economy Policy Papers into one Action Plan. Organized by those four topic areas, this paper categorizes actions, sets priorities and identifies initial implementation tasks.

In general, actions associated with our Decision-Making Policy Paper serve as a platform to support and facilitate topic-specific actions. We recommend regional policy makers begin implementing many of the decision-making recommendations in the near-term, while simultaneously pursuing easily achievable strategies from the other categories. Many of the more complex recommendations will require coordinated regional policy before being enacted. Implementing the decision-making recommended actions will help with more even implementation across the region, increasing resilience as a whole.

Implementation Level

In this paper, each action has been identified by the level at which it can be initiated and implemented – regional, local, or both. Many actions will need to be developed and initiated through a regional effort, led by a regional body such as ABAG, MTC, or JPC. For certain actions, this regional work will then spur community-specific actions at the local level with policy, assistance, or information-sharing. The focus of this work is on regional-level initiatives, therefore very few actions are recommended for local initiation prior to regional resolution. Planning and technical guidance for those local actions will be available from the region.

Action Categories

Recommended actions are also categorized by type based on thematic similarity. The categories of actions are as follows:

Facilitation: These types of actions create forums and frameworks to facilitate action, but do not necessarily generate a concrete resilience action. They depend upon enabling participants to discover, communicate, and collaborate to implement concrete actions. These actions also help to build relationships, which is crucial to building resilience.

Education/Information: Education and Information actions actively seek to gather and communicate new information to assist stakeholders and encourage voluntary actions to plan for recovery or to increase resilience.

Evaluation: In many cases we may not have a clear picture on what the status or effectiveness of existing programs, policies, or resources. Evaluation tasks help to better understand our current level of resilience and set a baseline against which to track future work.

Policy Development: This category seeks to develop policy which supports resiliency capacity building and that can be adopted at the regional level or serve as a model for adoption at the local level. The goal is to provide tools that can be easily utilized by jurisdictions as well as establish consistent baseline policy for the entire Bay Area.

Further Study/Research: Many of the recommended actions require additional understanding or technical research on best practices or development of tools before specific actions should be implemented. Actions in this category warrant additional resources for study.

Program and Operation: These actions require a program with stakeholder support, resources, public involvement, and a defined outcome. Many of these types of actions will require local-level programs, with the region providing assistance and coordination.

Timeframe

Each recommended action is assigned a general timeframe for implementation. The reasoning behind the timeframes is below:

Short-Term: These are items that can be easily accomplished in the near-term with few additional resources or research. Many of these actions require organizational changes or slightly changed or expanded scopes of work rather than entirely new scopes of work. These changes could be completed within 1-5 years.

Medium-Term: Actions in this category require a bit more effort to implement. They may require some level of resources, additional research, or depend on another task or action to be accomplished before they are feasible. They may require setting up a new program or operation, or staff to plan for implementation. These actions could be completed within 5-10 years.

Long-Term: This category encompasses the most complex actions which may require substantial resources, research, or preparatory work. They may require broad coordination or change of political will that may take years to accomplish. These actions may be subdivided into phases to make them more achievable. Actions in this category may take up to 20 years to complete.

How to Use This Document

Each action is summarized in a quick overview table, enabling the reader to easily see the timeframe, categories, and level of implementation. This is followed by a text summary of the meaning of the action and initial implementation tasks. This document also contains two larger tables – a summary table at the beginning of the document showing all of the recommended actions at-a-glance (see below) and an initial implementation timeline following. This “timeline” helps to organize the actions to prepare for the development of a detailed implementation plan.

Recommended Actions Summary

Key to Colors
Short-Term (can be completed within 1-5 years)
Medium-Term (can be completed within 5-10 years)
Long-Term (may take up to 20 years to complete)

Regional Decision-Making		
Recommended Action	**Level of Implementation**	**Initial Implementation Tasks**
DM-1: Use existing structures to convene jurisdictions and facilitate communication around disaster recovery collaboration	Regional	• Convene JPC and/or RPC to discuss potential formation of disaster recovery forum • Identify potential roles and organizing structure for forum • Identify goals and objectives for forum • Recruit "champion" within RPC or JPC to help gather stakeholders • Coordinate with other similar initiatives, such as the Joint Policy Committee's Climate Action and Energy Resilience Project
DM-2: Examine the feasibility of a regional disaster recovery framework	Regional	• Look at existing recovery plans and frameworks to establish best practices and ensure integration • Work with regional recovery forum to

		establish a working group tasked with development of a recovery framework • Establish stakeholder input process to solicit feedback from local jurisdictions
DM-3: Integrate resilience policy into current plans and practices	Regional, local	• Incorporate resilience discussions into the second iteration of the SCS • Identify best practices for jurisdictions and develop a guide to assist in implementation
DM-4: Lead reconnaissance missions for local leaders, staff, and community leaders to areas undergoing disaster recovery	Regional, local	• Identify potential funding sources • Identify leaders to attend, such as ABAG's RPC members or other groups • Establish a MOU with EERI to expand their program to include local stakeholders
DM-5: Establish and maintain a recovery clearinghouse to house resources for pre-disaster recovery planning and post-disaster recovery guidance	Regional, local	• Identify a staff lead, with funding, to begin research and resource collection • Examine platforms for sharing, including websites, Base Camp, and file-sharing systems
Housing		
Recommended Action	**Level of Implementation**	**Initial Implementation Tasks**
H-1: Identify high hazard areas with vulnerable housing types and vulnerable populations across the region	Regional, local	• Gather vulnerable population data to input into GIS • Secure funding for ABAG staff time
H-2: Address the problem of underinsured homeowners with more realistic	Regional, local	• Establish contact with the California

hazard insurance availability		Earthquake Authority and engage in discussions
H-3: Support interim housing solutions, likely to be in place after future disasters for three to ten years, that encourage residents to invest in the Bay Area's recovery	Regional, local	• Identify best practices shelter-in-place policies and the development of neighborhood support centers • Develop pre-disaster temporary sheltering plans and policies
H-4: Maintain affordable housing and return low-income tenants to their homes by identifying gaps in existing programs and financial mechanisms that will speed the repair and reconstruction of multifamily residences	Regional, local	• Gather best practices around multifamily reconstruction and repair financing • Begin drafting regional policy recommendations and examine the feasibility of new programs
H-5: Establish financing mechanisms to facilitate seismic mitigation of residential properties	Regional, local	• Engage lobbyists and prepare a policy platform around PACE funds and upholding AB184 • Identify best practices and sources of funding for seismic retrofit funding • Explore innovative public/private partnerships for funding sources
H-6: Reduce personal and community losses by increasing resilient building and retrofit practices	Local	• Establish a technical team to research and develop standard guidelines for single-family retrofits • Engage with the California Earthquake Authority and FEMA to coordinate efforts
H-7: Improve the quality of non-engineered retrofits by developing a statewide retrofitting license for contractors, or providing contractor training	Regional	• Organize best management practices to inform state licensing • Establish a regional certification program for pre-disaster retrofit and post-disaster

		repair, building on ABAG's previous efforts
H-8: Increase the number of retrofitted homes by providing financial incentives for homeowners to retrofit	Regional, local	• Work with One Bay Area Grant managers to establish language for seismic improvements in grant qualifications • Partner with the California Earthquake Authority to utilize their mitigation funding effectively • Implement Recommended Action H-1 to identify high priority areas for mitigation funding
Infrastructure		
Recommended Action	**Level of Implementation**	**Initial Implementation Tasks**
I-1: Establish regional baseline assessment and system performance standards to identify vulnerabilities and define interdependencies	Regional	• Research best practices for assessing infrastructure vulnerabilities and baseline conditions • Establish a working group to identify standard earthquake scenarios and educate infrastructure providers on how to use the scenarios for assessment purposes • Provide a platform for providers to share their own research and best practices
I-2: Conduct a regional assessment of system interdependencies and the consequences of cascading failures	Regional	• Utilize ABAG's existing Lifelines Committee to oversee a system assessment • Research best practices for interdependencies assessments

		• Partner with San Francisco Lifelines Council to avoid duplicating efforts • Develop scenario and work plan
I-3: Evaluate the usefulness of creating performance targets to establish region-wide performance goals for all infrastructure systems	Regional	• Develop a technical team to examine SPUR and other existing performance categories for feasibility • Conduct necessary research on the Bay Area's infrastructure systems to develop categories tailored to our specific Bay Area needs
I-4: Identify strategies to reduce interdependencies and develop plans to assist with implementation	Regional	• Develop a technical research team composed of engineers and other mitigation experts • Research existing policy and develop recommendations based on technical research
I-5: Establish a senior leadership forum on infrastructure resilience issues to convene providers and stakeholders	Regional	• Identify existing groups that may be able to expand to take on this responsibility • Establish goals and objectives for forum
Economy and Business		
Recommended Action	**Level of Implementation**	**Initial Implementation Tasks**
EB-1: Support pre-disaster economic development through existing regional best practices	Regional, local	• Prepare an implementation plan for the Bay Area Council's recommendations, identifying appropriate stakeholders, fora, and funding sources for implementation projects

EB-2: Implement the recommendations of the Resilience Initiative's Decision-Making, Housing, and Infrastructure Policy Papers	Regional, local	• Identify short-term tasks in previous recommendations that most effectively support the regional economy and begin implementation
EB-3: Encourage best practices that support business continuity and facilitate restoration of regional economies	Regional	• Identify topics for further research • Identify appropriate research teams or partnerships with research institutions to establish programs of study
EB-4: Explore innovative financial incentives to support disaster resilience initiatives for small business	Regional, local	• Identify private sector partners to begin conversations about incentives • Explore best practices and case studies around financing incentives