

OCTOBER 1, 2014

ABAG
Regional Planning Committee

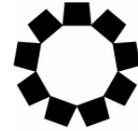
AGENDA, MINUTES AND ATTACHMENTS

ASSOCIATION OF BAY AREA GOVERNMENTS

REPRESENTING CITY AND COUNTY GOVERNMENTS OF THE SAN FRANCISCO BAY AREA

ASSOCIATION OF BAY AREA GOVERNMENTS

Representing City and County Governments of the San Francisco Bay Area



ABAG

AGENDA

REGIONAL PLANNING COMMITTEE

Wednesday, October 01, 2014, 12:00 PM-3:00 PM

Location:

Lawrence D. Dahms Auditorium

Joseph P. Bort MetroCenter

101 8th Street

Oakland, California

The ABAG Regional Committee may act on any item on this agenda.

Agenda and attachments available at abag.ca.gov

For information, contact Wally Charles, ABAG Planning and Research, at (510) 464 7993.

1. CALL TO ORDER / CONFIRM QUORUM

2. PUBLIC COMMENT

Information

3. APPROVAL OF SUMMARY MINUTES OF AUGUST 6, 2014

ACTION

Attachment: Summary Minutes August 6, 2014

4. ANNOUNCEMENTS

Information

A. Committee Members

B. Staff Members

5. SESSION OVERVIEW

Information

Miriam Chion, ABAG Planning and Research Director

Attachment: Staff memo: Overview Session October 01, 2014

6. REVIEW OF PRIORITY DEVELOPMENT AREA CRITERIA

Action

Mark Shorett and Christy Leffall, Regional Planners at ABAG Planning and Research Department will provide an overview of the Priority Development Area criteria.

Attachment:

1. *Priority Development Area (PDA) List*
2. *Regional Priority Development Area (Map)*
3. *Summary PDA Criteria/Guidelines Table*
4. *PDA Size Graphs*

7. ADVANCING BAY AREA RESILIENCE: ABAG'S INTEGRATED APPROACH

Action

ABAG staff Danielle Mieler, Dana Brechwald, Michael Germeraad, and ABAG Policy Advisor Arrietta Chakos will present key findings from ABAG's current resilience work in housing and infrastructure, the future direction of resilience planning at ABAG, and proposed regional resilience policies.

Attachment:

- 1: *Bay Area Housing and Community Multiple Hazards Risk Assessment*
- 2: *Infrastructure Resilience Overview*
- 3: *Draft State and Regional Legislative Policy Agenda*

8. ADJOURNMENT

Next meeting: Wednesday, December 3, 2014

Submitted:

A handwritten signature in black ink that reads "Miriam Chion". The signature is written in a cursive style with a long horizontal line extending from the end of the name.

Miriam Chion
Planning and Research Director

Date: September 10, 2014

SUMMARY MINUTES (DRAFT)

ABAG Regional Planning Committee Meeting
Wednesday, August 6, 2014
Joseph P. Bort MetroCenter
101 8th Street, Oakland, California

1. CALL TO ORDER

ABAG President Julie Pierce, acting Chair of the Regional Planning Committee and Councilmember of City of Clayton, called the meeting to order at 12:15 PM.

Acting Chair Pierce led the Board and the public in the Pledge of Allegiance.

Chair Pierce explained that the revised agenda Item 5, Resignation of the Chair, has been removed.

A quorum of the committee was present.

Committee Members Present

Ronit Bryant, Councilmember
Diane Dillon, Supervisor
Pat Eklund, Councilmember
Martin Engelmann, Dep. Exec. Director of Planning
Pradeep Gupta, Councilmember
Scott Haggerty, Supervisor
Erin Hannigan, Supervisor
John Holtzclaw
Nancy Ianni
Michael Lane, Policy Director

Kristina Lawson, Councilmember
Mark Luce, Supervisor
Jeremy Madsen, Executive Director
Eric Mar, Supervisor
Nate Miley, Supervisor
Karen Mitchoff, Supervisor
Julie Pierce, Councilmember (ABAG President)
Laurel Prevetti, Assistant Town Manager (BAPDA)
Harry Price, Mayor
Carlos Romero, Director
Pixie Hayward Schickele
Warren Slocum, Supervisor
Jill Techel, Mayor
Egon Terplan, Planning Director
Dyan Whyte, Assist. Exc. Officer

Jurisdiction

City of Mountain View
County of Napa
City of Novato
Contra Costa Transportation Agency
City of South San Francisco
County of Alameda
County of Solano
Sierra Club
League of Women Voters--Bay Area
Non-Profit Housing Association of Northern California
City of Walnut Creek
County of Napa
Greenbelt Alliance
City and County of San Francisco
County of Alameda
County of Contra Costa
City of Clayton
Town of Los Gatos
City of Fairfield
Urban Ecology
California Teachers Association
County of San Mateo
City of Napa
SPUR
San Francisco Regional Water Board

Members Absent

Susan L. Adams, Supervisor
Shiloh Ballard
Andy Barnes, Policy Chair
Desley Brooks, Councilmember
Paul Campos, Director
Tilly Chang, Executive Director
Julie Combs, Councilmember
Dave Cortese, Supervisor (RPC Chair)
Anu Natarajan, Vice Mayor (RPC Vice Chair)
David Rabbitt, Supervisor (ABAG Vice President)
Mark Ross, Councilmember
Carol Severin, Associate Director
James P. Sperring, Supervisor

Jurisdiction

County of Marin
Silicon Valley Leadership Group
Urban Land Institute
City of Oakland
Building Industry of America--Bay Area
SFCTA (City of San Francisco)
City of Santa Rosa
County of Santa Clara
City of Fremont
County of Sonoma
City of Martinez
East Bay Regional Park District
County of Solano

2. PUBLIC COMMENT

There were public comments on Item 6 from Lisa Vorderbrueggen, BIA Bay Area and Pam Drew, Oakland.

3. APPROVAL OF REGIONAL PLANNING COMMITTEE MEETING MINUTES OF JUNE 4, 2014.

Acting Chair Julie Pierce, Councilmember of City of Clayton, recognized a motion by Councilmember Pat Eklund, City of Novato, and seconded by Member John Holtzclaw, Sierra Club, to approve the committee minutes of June 4, 2014. The motion passed unanimously.

4. ORAL REPORTS/COMMENTS

A. Committee Members

Acting Chair Pierce welcomed and introduced new Regional Planning Committee Member Martin Engelmann, Deputy Executive Director of Planning, Contra Costa Transportation Authority.

Member Eklund announced she and ABAG Staff will be meeting with Bay Area Air Quality Management District for a briefing on their new vehicle miles traveled tool.

5. SESSION OVERVIEW BY

MIRIAM CHION, ABAG Planning and Research Director

Ms. Chion explained that what the Regional Planning Committee approved and recommended as criteria for Priority Conservation Areas (PCAs) was adopted by the Executive Board with one minor clarification: that the priorities for a disadvantaged community only relates to Urban Parks. This was an adjustment of two words. PCAs can be adopted until May, 2015; then adoption will close for both PCAs and PDAs. ABAG Staff are in the process of contacting the jurisdictions to know what changes they want to include in the PCAs. Miriam then explained the contents of

today's session, and also introduced and reminded the committee of the flyers for the Loma Prieta Earthquake 25-year anniversary as well as the Bay Trail 25-year anniversary.

6. TASKS AND APPROACH TO PLAN BAY AREA 2017 UPDATE

Information

Miriam Chion, ABAG Planning and Research Director, provided an overview of tasks and schedule for Plan Bay Area 2017. Brad Paul, ABAG Deputy Executive Director, described what went well and what did not go well in the process that led up to adoption of the first Plan Bay Area (2013) then discussed what a more thoughtful and responsive way to talk about Plan Bay Area 2017 might look like, one that better serves the needs of our member jurisdictions, delegates and the public.

Attachments:

- 1. Staff memo on Plan Bay Area 2017 Update*
- 2. Plan Bay Area 2017 Process*
- 3. Staff memo on How we talk about Plan Bay Area 2017*
- 4. List of Attendees at County Delegate Meetings*
- 5. List of PDA Site Visits*

Member Holtzclaw agreed and thanked ABAG Staff for the presentation and ideas expressed. He explained that we speak of "compact communities" and "convenient communities with a lot of destinations nearby." MTC says 15% of trips are commutes; the other 85% can be made more convenient and walkable. These are trips to schools, parks, shopping, entertainment and restaurants. ABAG could help the less dense communities develop more local destinations, and more public transportation choices. Downtown Napa, for instance, is not high-rise but is mixed use, and has a WalkScore near 100%. Downtown Santa Rosa is similar. To clarify agency interactions, he suggested having a diagram that explains what each agency does and gives each agency's line a different color so it is easy to follow. It would show that local governments have control over development areas and conservation areas.

Jeremy Madsen agreed with Member Holtzclaw and ABAG staff; he said they are moving from a frame of "here is the mandate" to "how will this make everyone's lives better." He suggested notifying communities about the Plan by going to places where they are engaged, such as the chamber of commerce, clubs, neighborhood associations, etc. and listening to their inputs will be a better way to connect to people.

Member Gupta thanked Staff for a great summary to inform the Committee what they have learned, the good and the bad. He would like to keep the spirit of communication between ABAG and the local jurisdiction a two way communication; the Plan has to show realism for the period of time and the thinking has to be both ways. The methodology that Miriam might be thinking about should have room to accommodate deviations from what you have done in the first cycle and accentuate different communities. He said the process of planning is as important as the Plan itself. He thinks that by the time the Plan comes out as a document a lot of thinking, interaction, and dialog has taken place between the stakeholders and a lot of understanding and issues have changed. When designing the process for the Plan, take into consideration County and State policies. When the research is done for population and housing there are

assumptions about how many people will migrate to the Bay Area, and this item should be considered early in the process so jurisdictions could have some input.

Member Hannigan pointed out that the pyramid graph on the presentation may have to be revised, the information from the top needs to be placed on the bottom to give the correct message. She suggested looking at how planning departments speak to their elected officials and boards to learn what resonates with communities.

Member Ronit Said she agrees with Member Hannigan on the graphic. She congratulated Brad for a great presentation that shows staff is headed in the right direction. She agreed with Member Madsen about outreach to the public. There is not one solution that fits everyone. The Bay Area is a large region with very different counties. Each county has to figure out what is the best way to communicate to the public. In large counties it may be a good idea to go through city councils. We need to inform and educate the public so we don't have members of the public complaining that they never heard about the process. It would be a lot of work but a great reward.

Member Eklund agreed with previous comments that communication between the public and elected officials needs to be improved. There needs to be a two-way communication. She is very surprised that the public still does not know the role of ABAG and Plan Bay Area. She emphasized the importance of having the ABAG delegates and alternates in each county get involved with the public. The public needs to be educated about ABAG and MTC and asked for input on how to go forward. Brad mentioned Basecamp which was a great tool for the Housing Methodology Committee, but the elected officials cannot access Basecamp—only the planning staff do. It would be great if ABAG delegates and alternates could have access to Basecamp. She also expressed interest in having a discussion about having local jurisdictions vote on Plan Bay Area

Mr. Paul shared that Marin delegates asked to have ABAG lead a meeting on the Plan Bay Area Update, which was very encouraging to staff.

Member Terplan suggested that planning should be done more regionally. Examples of regional planning include the Golden Gate National Recreation Area, East Bay Regional Park District, Save the Bay, which all were done by collecting action. The success of Plan Bay Area is contingent upon local governments and stakeholders taking action and doing the right thing over a 30-year period. He would like to see more discussion about MTC's role in this committee. The public needs to know that MTC and ABAG work together.

Chair Pierce indicated that the whole point of Plan Bay Area is to give to our children and grandchildren a great place to live as we enjoyed or even better. She emphasized the importance of figuring out how we make that happen, since those numbers that we are looking at represent the next generation; it is our responsibility to create a better place for them.

Member Haggerty shared his deep concern about the need for more funding for PCAs. He also would like to have more business groups invited to Regional Planning Committee meetings and involved in updating Plan Bay Area.

Karen Mitchoff had a concern that the committee needs to have a conversation about public voting on Plan Bay Area. There needs to be a clear message about why "yes" or why "no."

Member Eklund agreed that there needs to be a discussion if General Assembly could vote on the Plan Bay Area Update.

Member Mar agreed with points made by Member Terplan, and mentioned that there seems to be a lot of fear that the cities want to dominate the rural areas, and this fear should be broken down. Representatives of San Jose, San Francisco and Oakland cannot be selfish about their own cities but must cooperate with the region. He also agreed with Member Holtzclaw's comments, and suggested having communications experts help to find out what the tea party and other opponents of regional planning say, and how we can frame issues better so that everyone will understand.

Member Romero indicated that ABAG is a regional agency which listens and then leads. He emphasized the importance of using our leadership role to explore how we live, and how we create a society in the future that our children and grandchildren really appreciate.

Member Holtzclaw suggested that it would be helpful if we could develop a SimCity type plan, which would give people the chance to see what the whole region is doing and planning, and everyone could interact and see what can be accomplished by working together.

Ms. Chion explained that, at the Executive Board's request, ABAG staff is working on a small pilot project using "UrbanCanvas." It includes five cities of different sizes where we can analyze potential development. In response to Member Haggerty's earlier comments, she stated that ABAG is participating in an economic development project led by the Bay Area Council Economic Institute, which involves a dialogue with businesses and business organizations. We will get their input on current economic challenges and links to Plan Bay Area.

Member Luce expressed appreciation for the discussion and stated that we should not only consider housing proximity to transit but also jobs proximity to transit.

Member Madsen mentioned that he has experience using SimCity at Greenbelt Alliance, and agreed that it is worth considering, although it has its limitations. He suggested we explore getting funding to support this technology from philanthropic organizations as well as high tech businesses.

7. HOUSING STRATEGIES: REGIONAL PROSPERITY CONSORTIUM

Information

Duane Bay, ABAG Assistant Planning Director, and Gillian Adams and Johnny Jaramillo, ABAG Senior Regional Planners, provided an overview of housing strategies focused on the Regional Prosperity Consortium and two pilot projects that address small site acquisition and preservation of affordable housing.

Attachments:

1. *Staff Memo*
2. *Regional Prosperity Consortium Project List*
3. *Regional Prosperity Consortium Project Description*
4. *San Francisco Small Sites Acquisition and Stabilization project application presented by **Tracy Parent**, Organizational Director, San Francisco Community Land Trust*
5. *Preserving Affordable Housing near Transit project application presented by **James Pappas**, Housing Policy and Preservation Associate, California Housing Partnership*

Member Lane expressed appreciation for the great work and development of best practices that will support housing elements and local policies. We need to get this information out to cities and the Congestion Management Agencies (CMAs). Local support for housing is important, which is why we are supporting local housing impact fees and forms of tax increment finance. We need to understand the relationship between planning and finance. There is competition for these sites from the private sector. For the Regional Housing Need Allocation (RHNA), rehab can account for up to 25% of a city's allocation, so it is in the jurisdictions' interest to identify those opportunities. We need to continue work on expansion of the Transit Oriented Affordable Housing Fund (TOAH) and Golden State Acquisition Fund, and use these pilot projects to inform how to use Cap and Trade funds. We need to demonstrate effectiveness of investments in PDAs through new construction and rehab.

Member Eklund asked for details about why TOAH did not work for SF.

Ms. Parent explained that the market price for real estate in San Francisco is much higher than what the affordable rents can cover with a mortgage at 6% to 7%. TOAH would maybe work if the interest rate was 3%. She suggested that, rather than having a blended interest rate over the whole mortgage, have first position mortgage affordable and a silent deferred loan.

Member Eklund asked for clarification about how projects are selected for TOAH. She mentioned that Novato has a successful affordable owner-occupied housing project, where the people that purchased in 2006 are still living there. Some owners have already paid their primary mortgage. Are there any suburban examples?

Mr. Bay confirmed with Member Eklund that we are looking for a rehab suburban example. He then explained that the strategies presented are very adaptable. In the case of San Francisco, working with four different organizations is most challenging. If it works in San Francisco, it can be considered in other places. One challenge of building affordable housing is the federal requirement of a lottery system, while the rehab approach allows the preservation of housing for local residents.

Member Terplan added that a lot of work goes into a community land trust, but San Francisco prices are now inflated. This community land trust approach requires a benevolent landlord who is willing to purchase the building and retain its affordability in perpetuity. Many places in the region have not recovered yet, specifically the East Bay, where this strategy might be more effective; can TOAH help this to work? He also mentioned that the formula for the Cap and Trade funding does not favor the Bay Area.

Mr. Rapport explained that the State is going to use EnviroScreen to focus 50% of the Cap and Trade money on disadvantage communities. The Bay Area does not score well with EnviroScreen and the Central Valley does much better, but it will be difficult to change the State's approach. If you look at the top 20% of EnviroScreen statewide, there is a significant number of East Bay Communities that would qualify. There is also 50% of the funding that does not need to serve disadvantaged communities. The application process for Cap and Trade funding is not completed yet. We will need a very strong nexus to the reduction in GHG emissions. We are working on strategies to prepare applications that cut across various categories.

Member Lane stated that State Senate President pro tem-elect De Leon sponsored SB 535 that emphasized disadvantage communities. Zip code was one aspect but rent burden is considered in the criteria and there will be opportunities to discuss the criteria. Affordable housing serves disadvantage communities. We are cautiously optimistic about the program.

Mr. Rapport shared that the Strategic Growth Council Workshop will be on August 14th, in the auditorium at ABAG, from 1:00 PM -4:00 PM.

Mr. Pappas added HCD is very involved in the investment strategy for Cap and Trade. They are looking at the existing TOD program which should be beneficial for the Bay Area.

Ms. Parent shared that out of four partner organizations in San Francisco they are the only land trust model and they were successful in acquiring three small sites with private financing in the last three years. They have a shared form of ownership which incentivizes residents to keep operating costs low. The other community land trusts are Oakland Community Land Trust, Northern California Land Trust, Bay Area Community Land Trust and Housing Land Trust of Sonoma. The Oakland CLT acquired foreclosed homes but had a hard time competing against all-cash offers. For projects they were able to acquire, the challenge was to find families that were mortgage ready. The land trust allows families to buy a share, and the CLT is the mortgage holder rather than the owners. TOAH does not work for mixed-use.

Member Romero indicated the two projects presented different lessons; there are 47 projects in the Regional Prosperity Consortium that complement each other. We expect the completion of these projects by March of next year. We need to share all those ideas. The San Francisco example is a proposal to use affordable housing money, not only for 60% but up to 100% AMI, for workforce housing. This is a different approach to affordable housing in response to crisis that is being put forward by some of the most progressive organizations. The methodology which James used can be applied to the displacement spiral of people, before the situation becomes acute. We should use it in Oakland and San Jose and Concord. We need to look at all 47 projects in combination to triangulate policies, tools and strategies which several cities can use.

Mr. Rapport said we would like to integrate the 47 projects into Plan Bay Area, but it first has to come to all the committees for discussion. We will present a high level of summary of what we learned from this project. The key issue is that we lost our affordable housing funding, so the approach and process need to change. We need to work with the private sector and we need a permanent source of affordable housing, as many other states have. This would be required for a successful Bay Area.

Member Romero added both presentations were more technical than needed. Staff can summarize the key points of the various projects.

Ms. Parent explained we are completely aware that more money will not solve the situation. The San Francisco Board of Supervisors is developing new strategies to curb the prices in the market. Financing programs and antispeculation, property tax, tenant opportunity tax, legislation that allows non-conforming units brought to code; all together leverages our limited resources through legislation.

Member Haggerty stated that gentrification and exploding housing prices are the result of jurisdictions that go out and find young white companies and incentivize them to come to their communities. Why do we not talk about the attraction of those businesses and the implications of gentrification? Why don't we look at manufacturing jobs with good wages? We really need a

better mix of jobs for low-income people to rise to a higher level. We need to attract a good mix of jobs, not just high wage.

Member Techel asked if there is any data on the effect of Airbnb or recommendations for what elected officials should do to respond to the Internet phenomena through which you make units available for short term rents or weekend vacation rentals.

Mr. Paul explained that there are two ways in which Airbnb works. One is you have a three bedroom home, your kids are grown and moved out of the house, and you rent a bedroom or the whole house while you go on vacation to other vacationers. That is not a bad thing. But the other way is that companies that take entire houses and large apartment buildings and rent them out like a hotel in areas where hotels are not allowed. That is challenging to deal with. And there are now some people that only buy properties to rent out to short term rentals, because they can make so much more money. If that is the case, over time there will be less and less housing for the local population and more for tourists in San Francisco.

Member Madsen said this is a very tough issue that they need to keep talking about even after the Regional Prosperity Funding, which has supported the research, goes away. Displacement, prosperity, sustainability, and quality of life all tie together, as we speak about Plan Bay Area. In affordable housing there is a battle between folks that want preservation and folks that want production. Those are both very important issues that need to be discussed.

Member Luce mentioned Napa County's Work Proximity Housing Program, which is a very capital efficient, very low overhead, two year program with 44 families from low to moderate income, in real homeownership and each one has already \$100K equity. We really need to look at how long people are on transit. We need to get the numbers of participants up. The County of Napa has been trying to address the issue of Airbnb. We found people who advertise illegal Bed and Breakfasts, which is not allowed in the County of Napa because of housing reduction.

Chair Pierce expressed her support to the "Work Proximity Housing Program" and how well it works, could be used in any County.

Member Terplan added that the local tie is funding and it is transportation funding. Regional funding needs to be used for affordable housing and transportation.

Ms. Chion indicated that as they approach the Plan Bay Area 2017 Update, this conversation will define the areas to be considered. ABAG Staff are working with local jurisdictions and CMA directors to see what individual strategies for affordable housing are in place and what the expectations are. The work with the CMAs is crucial in that. Other topics we need to include will be part of the discussion at the Executive Board and this committee. To the point made about coordination with MTC, the agencies have been discussing the intersection of these issues, how to collaborate, and their different roles at the Joint Planning/Administrative Committee of MTC and ABAG. In the next session they can make that more explicit, what the different roles are and what are the areas where they come jointly to orchestrate transportation and land use.

Member Romero added that it would have been interesting to have a third presenter who focused on renters' rights. In the future many of the PDAs will see displacement pressure from new development and rezoning of land.

Acting Chair Pierce adjourned the Regional Planning Committee at 3:05 PM.

ADJOURNMENT

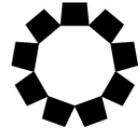
The next meeting of the Regional Planning Committee will be on October 1, 2014 at 12:00 PM.

Submitted:

Wally Charles

Date: August 29, 2014

For information or to review audio recordings of ABAG Regional Planning Committee meetings, contact Wally Charles at (510) 464 7993 or info@abag.ca.gov.



Date: September 23, 2014
To: Regional Planning Committee
From: Miriam Chion, ABAG Planning & Research Director
Subject: Overview Session October 1, 2014

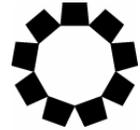
At our last meeting, the Regional Planning Committee provided substantial feedback and guidance on the approach to public engagement for Plan Bay Area 2017. The Committee also reviewed and discussed the various projects on housing planning and strategies and identified key issues to be addressed in the future.

The October session focuses on PDA criteria and regional resilience. The Regional Planning Committee and the Executive Board had requested to review the existing **PDA Criteria**. At this point staff is recommending to retain the existing criteria given the substantial input received in the past, their alignment with Plan Bay Area goals, and their ease of implementation at the local level.

We will also review our efforts on **regional resilience**. The recent South Napa earthquake has reminded us of the complexity of earthquake preparedness and recovery. Our cities and counties in the North Bay have demonstrated a solid response to this event and have provided good lessons and advice for the region at large. They shared their experiences with the ABAG Executive Board at our last meeting. Staff will present current and future projects as well as an overview of the upcoming Loma Prieta 25 Symposium.

For our last session of 2014, we will address the challenges of and opportunities for strengthening the urban vitality of our Priority Development Areas. We will review some interesting examples of place-making and discuss potential strategies. We will also review our research program on economic and demographic analysis.

For 2015, ABAG will be releasing several reports and completing several projects, including the State of the Region Report, the East Bay Corridors workshops and report, the Regional Prosperity report and capstone conference, the Bay Area Place-Making report, the Housing and Community Risk Assessment, the Infrastructure Vulnerability report and the regional forecast. We will be presenting some of these projects to the Regional Planning Committee.



Date: 9/23/2014
To: Regional Planning Committee
From: Miriam Chion, Planning and Research Director
Subject: **Review of Priority Development Area (PDA) Criteria**

At the request of the Regional Planning Committee and Executive Board, we are providing an overview of the region's Priority Development Area (PDA) criteria and guidelines.

PDA Criteria

The existing PDA criteria were established in 2008 as part of the FOCUS Program. The criteria were extensively vetted and ultimately adopted by ABAG's Executive Board. They were revised in 2011 for inclusion in Plan Bay Area. Firstly, a PDA must have a resolution approved by a local jurisdiction responsible for land use. Secondly, a PDA must be located in an area that satisfies the following:

1. Within an existing community
2. Housing growth potential
3. Access to transit

All PDAs are proposed within the urban footprint of existing communities. This is intended to make use of the existing infrastructure and services. All PDAs consider potential housing growth; the planning efforts and housing construction feasibility varies across PDAs according to the local development and planning process and local vision. All PDAs must have access to transit infrastructure, including: 1) ½ mile around an existing rail station or ferry terminal, 2) ½ mile area served by bus route or bus rapid transit (BRT) corridor with a minimum headway of 20 minutes during peak weekday commute periods, or 3) ½ mile within a planned transit station defined in MTC's Resolution 3434.

PDA Guidelines

Guidelines for PDA size and density were established in key PDA program documents to serve as references for local planners and as measures of quality assurance for the PDA program at-large.

The PDA application guidelines recommend 100 acres, roughly ¼ mile radius, as an appropriate minimum size for PDAs given that the program seeks to support local area and specific planning. A maximum size of 500 acres has been suggested for specific planning areas applying for MTC PDA Planning Grant funds, however, specific planning areas and associated PDAs do not necessarily share the same boundaries.

PDA density guidelines are described in the Development Guidelines section of the Station Area Planning Manual¹, which recommends housing and employment development densities by PDA placetype. The manual identifies a range from 20-300 du/ac (dwelling units per acre) as housing density targets, and 1.0-5.0 FAR (floor area ratio) for employment density targets.

Most of the 191 PDAs are within the 100 to 500-acre range. PDA size outliers are largely due to local planning objectives for community and specific plans. These objectives define a broad range of geographies, from neighborhood main street corridors, often less than 100 acres, to institutional re-use parcels spanning more than 500 acres (see attachment 4).

Recommended Action

Retain the current three PDA criteria without modifications: location within an existing community, housing growth potential and access to transit. These criteria are grounded in a sustainable growth approach to the region and are aligned with the intent of SB 375.

Retain the density guidelines: They provide general references to local planners on the scale of the neighborhoods and the mix of shops, services and mobility options.

Revise the size guidelines from a range of 100-500 acres to 40-640 acres, or PDA-boundary alignment with an existing community planning process that connects housing to transit (see attachment 3). After reviewing the size distribution of smaller PDAs, we recommend a 40-acre minimum size to align with the distance of an 1/8 - mile radius around a transit station, which captures a convenient walking distance to transit and allows for a comfortable walking distance to adjacent PDAs and/or transit-serving neighborhoods. We recommend a maximum size of 640 acres to align with roughly a 1-mile radius around a transit station; this minor revision allows a fitter rounding to the transit criteria and standards. This criteria modification additionally broadens the size capture of existing PDAs between 40-640 acres (see attachment 4).

This revision will not affect the status or eligibility of existing PDAs. Upon recommendation by the Regional Planning Committee and adoption by the Executive Board, the updated guidelines will apply to applications for new PDAs and to existing PDAs applying for modifications. The deadline for PDA applications and modifications is June 30, 2015. Application materials can be found here: http://www.bayareavision.org/pdaapplication/PDA_ApplicationForm_Jan2014.pdf

Staff also recommends further analysis of transit access, housing plans and construction, and density of new projects in PDAs to assess the performance of PDAs in addressing sustainability goals.

Attachments

1. Priority Development Area (PDA) List
2. Priority Development Area (Map)
3. Summary PDA Criteria/Guidelines Table
4. PDA Size Graphs

¹ Station Area Planning Manual (Metropolitan Transportation Commission: 2007), pg. 17

Priority Development Area (PDA) List

9/23/2014



COUNTY	PDA NAME	PLANNING STATUS	PLACETYPE
Alameda	Alameda: Naval Air Station	Planned	Transit Town Center
Alameda	Alameda: Northern Waterfront	Potential	Transit Neighborhood
Alameda	Alameda County: Castro Valley BART	Potential	Transit Neighborhood
Alameda	Alameda County: East 14th Street and Mission Boulevard	Planned	Mixed-Use Corridor
Alameda	Alameda County: Hesperian Boulevard	Planned	Transit Neighborhood
Alameda	Alameda County: Meekland Avenue Corridor	Planned	Transit Neighborhood
Alameda	Albany: San Pablo & Solano Mixed Use Neighborhood	Potential	Mixed-Use Corridor
Alameda	Berkeley: Adeline Street	Potential	Mixed-Use Corridor
Alameda	Berkeley: Downtown	Planned	City Center
Alameda	Berkeley: San Pablo Avenue	Planned	Mixed-Use Corridor
Alameda	Berkeley: South Shattuck	Planned	Mixed-Use Corridor
Alameda	Berkeley: Telegraph Avenue	Potential	Mixed-Use Corridor
Alameda	Berkeley: University Avenue	Planned	Mixed-Use Corridor
Alameda	Dublin: Downtown Specific Plan Area	Planned	Suburban Center
Alameda	Dublin: Town Center	Planned	Suburban Center
Alameda	Dublin: Transit Center/Dublin Crossings	Planned	Suburban Center
Alameda	Emeryville: Mixed-Use Core	Planned	City Center
Alameda	Fremont: Centerville	Planned	Transit Neighborhood
Alameda	Fremont: City Center	Planned	City Center
Alameda	Fremont: Irvington District	Planned	Transit Town Center
Alameda	Fremont: Warm Springs	Planned	Suburban Center
Alameda	Hayward: Downtown	Planned	City Center
Alameda	Hayward: Mission Boulevard Corridor	Potential	Mixed-Use Corridor
Alameda	Hayward: South Hayward BART	Planned	Mixed-Use Corridor
Alameda	Hayward: South Hayward BART	Planned	Urban Neighborhood
Alameda	Hayward: The Cannery	Planned	Transit Neighborhood
Alameda	Livermore: Downtown	Planned	Suburban Center
Alameda	Livermore: East Side	Potential	Suburban Center
Alameda	Livermore: Isabel Avenue/BART Station Planning Area	Potential	Suburban Center
Alameda	Newark: Dumbarton Transit Oriented Development	Potential	Transit Town Center
Alameda	Newark: Old Town Mixed Use Area	Potential	Transit Neighborhood
Alameda	Oakland: Coliseum BART Station Area	Planned	Transit Town Center
Alameda	Oakland: Downtown & Jack London Square	Planned	Regional Center
Alameda	Oakland: Eastmont Town Center	Planned	Urban Neighborhood
Alameda	Oakland: Fruitvale and Dimond Areas	Planned	Urban Neighborhood
Alameda	Oakland: MacArthur Transit Village	Planned	Urban Neighborhood
Alameda	Oakland: Transit Oriented Development Corridors	Potential	Mixed-Use Corridor
Alameda	Oakland: West Oakland	Planned	Transit Town Center
Alameda	Pleasanton: Hacienda	Potential	Suburban Center
Alameda	San Leandro: Bay Fair BART Transit Village	Potential	Transit Town Center
Alameda	San Leandro: Downtown Transit Oriented Development	Planned	City Center
Alameda	San Leandro: East 14th Street	Planned	Mixed-Use Corridor
Alameda	Union City: Intermodal Station District	Planned	City Center
Contra Costa	Antioch: Hillcrest eBART Station	Planned	Suburban Center
Contra Costa	Antioch: Rivertown Waterfront	Potential	Transit Town Center
Contra Costa	Concord: Community Reuse Area/ Los Medanos	Potential	Suburban Center
Contra Costa	Concord: Community Reuse Area/ Los Medanos	Potential	Transit Neighborhood
Contra Costa	Concord: Downtown	Potential	City Center
Contra Costa	Contra Costa County: Contra Costa Centre	Planned	Mixed-Use Corridor
Contra Costa	Contra Costa County: Downtown El Sobrante	Potential	Mixed-Use Corridor
Contra Costa	Contra Costa County: Pittsburg/Bay Point BART Station	Planned	Transit Neighborhood
Contra Costa	Contra Costa County: Pittsburg/Bay Point BART Station	Planned	Transit Town Center
Contra Costa	Danville: Downtown	Potential	Transit Town Center
Contra Costa	El Cerrito: San Pablo Avenue Corridor	Planned	Mixed-Use Corridor
Contra Costa	El Cerrito: San Pablo Avenue Corridor	Planned	Mixed-Use Corridor
Contra Costa	Hercules: Central Hercules	Planned	Transit Neighborhood
Contra Costa	Hercules: Waterfront District	Planned	Transit Town Center
Contra Costa	Lafayette: Downtown	Planned	Transit Neighborhood

Priority Development Area (PDA) List

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COUNTY	PDA NAME	PLANNING STATUS	PLACETYPE
Contra Costa	Martinez: Downtown	Planned	Transit Neighborhood
Contra Costa	Moraga: Moraga Center	Potential	Transit Town Center
Contra Costa	Oakley: Downtown	Potential	Transit Town Center
Contra Costa	Oakley: Employment Area	Potential	Suburban Center
Contra Costa	Oakley: Potential Planning Area	Potential	Transit Neighborhood
Contra Costa	Orinda: Downtown	Potential	Transit Town Center
Contra Costa	Pinole: Appian Way Corridor	Potential	Mixed-Use Corridor
Contra Costa	Pinole: Old Town San Pablo Avenue	Potential	Mixed-Use Corridor
Contra Costa	Pittsburg: Downtown	Planned	Transit Neighborhood
Contra Costa	Pittsburg: Railroad Avenue eBART Station	Planned	Transit Town Center
Contra Costa	Pleasant Hill: Buskirk Avenue Corridor	Potential	Mixed-Use Corridor
Contra Costa	Pleasant Hill: Diablo Valley College	Potential	Transit Neighborhood
Contra Costa	Richmond: Central Richmond & 23rd Street Corridor	Planned	City Center
Contra Costa	Richmond: Central Richmond & 23rd Street Corridor	Potential	Mixed-Use Corridor
Contra Costa	Richmond: South Richmond	Planned	Transit Neighborhood
Contra Costa	Richmond (with Contra Costa County): North Richmond	Potential	Transit Neighborhood
Contra Costa	San Pablo: San Pablo Avenue & 23rd Street Corridors	Planned	Mixed-Use Corridor
Contra Costa	San Ramon: City Center	Planned	Suburban Center
Contra Costa	San Ramon: North Camino Ramon	Potential	Transit Town Center
Contra Costa	Walnut Creek: West Downtown	Planned	City Center
Contra Costa	West Contra Costa Transportation Advisory Committee: San Pablo Avenue Corridor	Planned	Mixed-Use Corridor
Contra Costa	West Contra Costa Transportation Advisory Committee: San Pablo Avenue Corridor	Potential	Mixed-Use Corridor
Contra Costa	West Contra Costa Transportation Advisory Committee: San Pablo Avenue Corridor	Planned	Mixed-Use Corridor
Marin	Marin County: Urbanized 101 Corridor	Potential	Transit Neighborhood
Marin	San Rafael: Downtown	Planned	City Center
Napa	American Canyon: Highway 29 Corridor	Potential	Mixed-Use Corridor
Napa	Napa: Downtown Napa and Soscol Gateway Corridor	Potential	Transit Neighborhood
San Francisco	San Francisco: 19th Avenue	Potential	Transit Town Center
San Francisco	San Francisco: Balboa Park	Planned	Transit Neighborhood
San Francisco	San Francisco: Bayview/Hunters Point Shipyard/Candlestick Point	Planned	Urban Neighborhood
San Francisco	San Francisco: Downtown-Van Ness-Geary	Planned	Regional Center
San Francisco	San Francisco: Eastern Neighborhoods	Planned	Urban Neighborhood
San Francisco	San Francisco: Market & Octavia	Planned	Urban Neighborhood
San Francisco	San Francisco: Mission Bay	Planned	Urban Neighborhood
San Francisco	San Francisco: Mission-San Jose Corridor	Planned	Mixed-Use Corridor
San Francisco	San Francisco: Port of San Francisco	Planned	Mixed-Use Corridor
San Francisco	San Francisco: Transbay Terminal	Planned	Regional Center
San Francisco	San Francisco: Treasure Island	Planned	Transit Town Center
San Francisco/San Mateo	San Francisco & Brisbane: San Francisco/San Mateo Bi-County Area	Potential	Suburban Center
San Francisco/San Mateo	San Francisco & Brisbane: San Francisco/San Mateo Bi-County Area	Planned	Transit Neighborhood
San Mateo	Belmont: Villages of Belmont	Potential	Mixed-Use Corridor
San Mateo	Burlingame: Burlingame El Camino Real	Planned	Transit Town Center
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Potential	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Potential	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	City/County Association of Governments of San Mateo County: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	Daly City: Bayshore	Potential	Transit Town Center
San Mateo	Daly City: Mission Boulevard	Potential	Mixed-Use Corridor
San Mateo	East Palo Alto: Ravenswood	Potential	Transit Town Center

Priority Development Area (PDA) List



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COUNTY	PDA NAME	PLANNING STATUS	PLACETYPE
San Mateo	Menlo Park: El Camino Real Corridor and Downtown	Planned	Transit Town Center
San Mateo	Millbrae: Transit Station Area	Planned	Mixed-Use Corridor
San Mateo	Redwood City: Broadway/Veterans Boulevard Corridor	Planned	Mixed-Use Corridor
San Mateo	Redwood City: Downtown	Planned	City Center
San Mateo	San Bruno: Transit Corridors	Planned	Mixed-Use Corridor
San Mateo	San Carlos: Railroad Corridor	Planned	Transit Town Center
San Mateo	San Mateo: Downtown	Planned	City Center
San Mateo	San Mateo: El Camino Real	Planned	Mixed-Use Corridor
San Mateo	San Mateo: Rail Corridor	Planned	Transit Neighborhood
San Mateo	South San Francisco: Downtown	Planned	Transit Town Center
Santa Clara	Campbell: Central Redevelopment Area	Planned	Transit Neighborhood
Santa Clara	Gilroy: Downtown	Planned	Transit Town Center
Santa Clara	Milpitas: Transit Area	Planned	Suburban Center
Santa Clara	Morgan Hill: Downtown	Planned	Transit Town Center
Santa Clara	Mountain View: Downtown	Planned	Transit Town Center
Santa Clara	Mountain View: El Camino Real	Potential	Mixed-Use Corridor
Santa Clara	Mountain View: North Bayshore	Potential	Suburban Center
Santa Clara	Mountain View: San Antonio	Potential	Transit Town Center
Santa Clara	Mountain View: Whisman Station	Potential	Transit Neighborhood
Santa Clara	Palo Alto: California Avenue	Planned	Transit Neighborhood
Santa Clara	San Jose: Bascom TOD Corridor	Potential	Mixed-Use Corridor
Santa Clara	San Jose: Bascom Urban Village	Potential	Mixed-Use Corridor
Santa Clara	San Jose: Berryessa Station	Planned	Transit Neighborhood
Santa Clara	San Jose: Blossom Hill/Snell Urban Village	Potential	Mixed-Use Corridor
Santa Clara	San Jose: Camden Urban Village	Potential	Mixed-Use Corridor
Santa Clara	San Jose: Capitol Corridor Urban Villages	Potential	Mixed-Use Corridor
Santa Clara	San Jose: Capitol/Tully/King Urban Villages	Potential	Suburban Center
Santa Clara	San Jose: Communications Hill	Planned	Transit Town Center
Santa Clara	San Jose: Cottle Transit Village (Hitachi)	Planned	Suburban Center
Santa Clara	San Jose: Downtown "Frame"	Planned	City Center
Santa Clara	San Jose: East Santa Clara/ Alum Rock Corridor	Planned	Mixed-Use Corridor
Santa Clara	San Jose: Greater Downtown	Planned	Regional Center
Santa Clara	San Jose: North San Jose	Planned	Regional Center
Santa Clara	San Jose: Oakridge/ Almaden Plaza Urban Village	Potential	Suburban Center
Santa Clara	San Jose: Saratoga TOD Corridor	Potential	Mixed-Use Corridor
Santa Clara	San Jose: Stevens Creek TOD Corridor	Potential	Mixed-Use Corridor
Santa Clara	San Jose: West San Carlos and Southwest Expressway Corridors	Planned	Mixed-Use Corridor
Santa Clara	San Jose: Westgate/El Paseo Urban Village	Potential	Suburban Center
Santa Clara	San Jose: Winchester Boulevard TOD Corridor	Potential	Mixed-Use Corridor
Santa Clara	Santa Clara: El Camino Real Focus Area	Planned	Mixed-Use Corridor
Santa Clara	Santa Clara: Santa Clara Station Focus Area	Planned	City Center
Santa Clara	Santa Clara Valley Transportation Authority: City Cores, Corridors & Station Areas	Potential	Mixed-Use Corridor
Santa Clara	Santa Clara Valley Transportation Authority: City Cores, Corridors & Station Areas	Potential	Mixed-Use Corridor
Santa Clara	Santa Clara Valley Transportation Authority: City Cores, Corridors & Station Areas	Potential	Mixed-Use Corridor
Santa Clara	Santa Clara Valley Transportation Authority: City Cores, Corridors & Station Areas	Potential	Mixed-Use Corridor
Santa Clara	Santa Clara Valley Transportation Authority: City Cores, Corridors & Station Areas	Potential	Mixed-Use Corridor
Santa Clara	Santa Clara Valley Transportation Authority: City Cores, Corridors & Station Areas	Potential	Mixed-Use Corridor
Santa Clara	Sunnyvale: Downtown & Caltrain Station	Planned	Transit Town Center
Santa Clara	Sunnyvale: East Sunnyvale	Potential	Urban Neighborhood
Santa Clara	Sunnyvale: El Camino Real Corridor	Planned	Mixed-Use Corridor
Santa Clara	Sunnyvale: Lawrence Station Transit Village	Potential	Transit Neighborhood
Santa Clara	Sunnyvale: Tasman Crossing	Potential	Transit Neighborhood
Solano	Benicia: Downtown	Planned	Transit Neighborhood
Solano	Benicia: Northern Gateway - Benicia's Industrial Park	Potential	Employment Center
Solano	Dixon: Downtown	Potential	Transit Town Center
Solano	Fairfield: Downtown South (Jefferson Street)	Planned	Suburban Center
Solano	Fairfield: Fairfield-Vacaville Train Station	Potential	Transit Town Center
Solano	Fairfield: North Texas Street Core	Potential	Mixed-Use Corridor

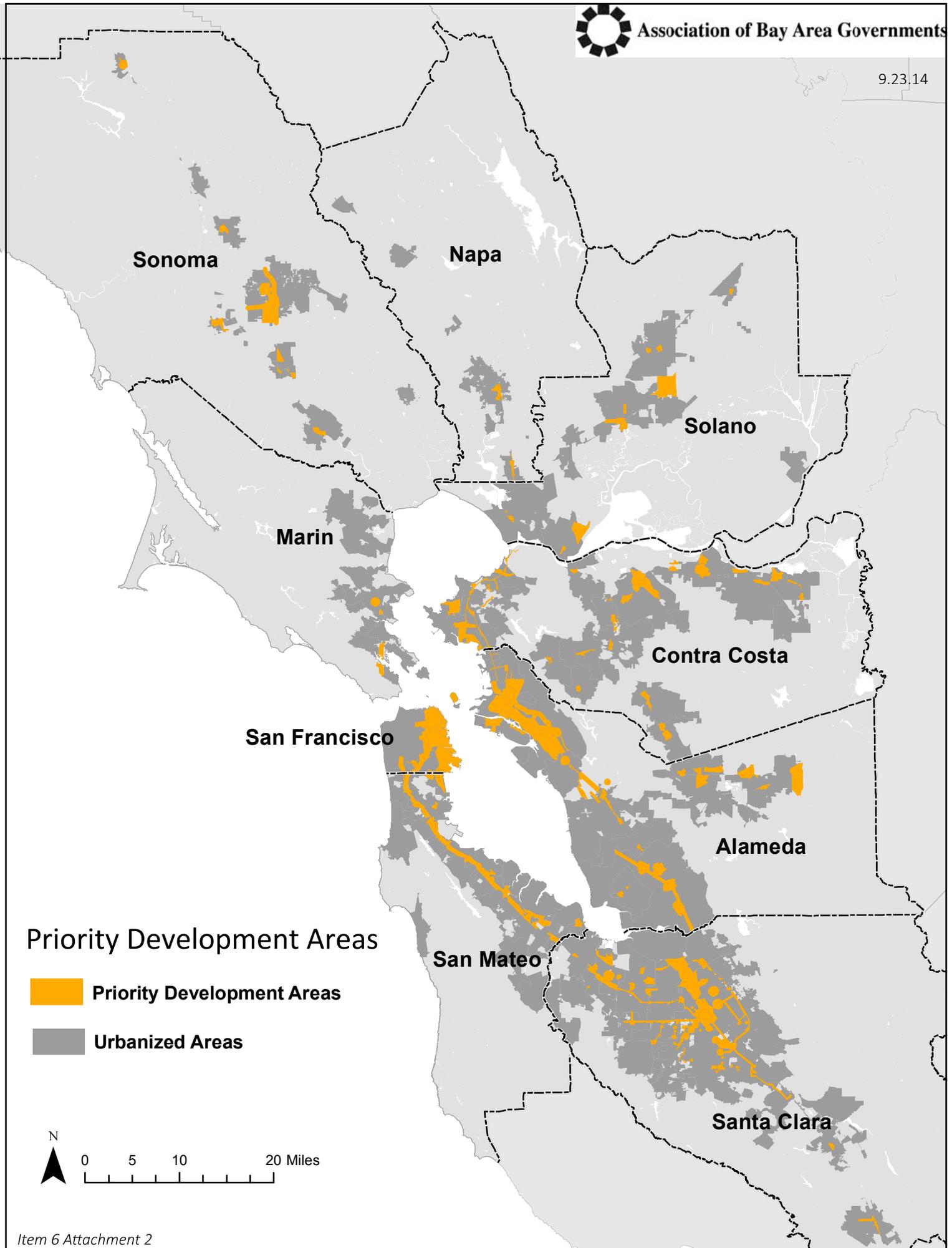
Priority Development Area (PDA) List

9/23/2014



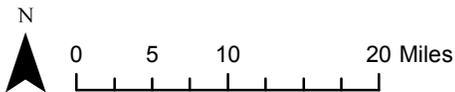
COUNTY	PDA NAME	PLANNING STATUS	PLACETYPE
Solano	Fairfield: West Texas Street Gateway	Planned	Mixed-Use Corridor
Solano	Suisun City: Downtown & Waterfront	Planned	Transit Town Center
Solano	Vacaville: Allison Area	Planned	Suburban Center
Solano	Vacaville: Downtown	Planned	Transit Town Center
Solano	Vallejo: Waterfront & Downtown	Planned	Suburban Center
Sonoma	Cloverdale: Downtown/SMART Transit Area	Planned	Transit Town Center
Sonoma	Cotati: Downtown and Cotati Depot	Planned	Transit Town Center
Sonoma	Petaluma: Central, Turning Basin/ Lower Reach	Planned	Suburban Center
Sonoma	Rohnert Park: Central Rohnert Park	Potential	Transit Town Center
Sonoma	Rohnert Park: Sonoma Mountain Village	Planned	Suburban Center
Sonoma	Santa Rosa: Downtown Station Area	Planned	City Center
Sonoma	Santa Rosa: Mendocino Avenue/Santa Rosa Avenue Corridor	Potential	Mixed-Use Corridor
Sonoma	Santa Rosa: North Santa Rosa Station	Potential	Suburban Center
Sonoma	Santa Rosa: Roseland	Potential	Transit Neighborhood
Sonoma	Santa Rosa: Sebastopol Road Corridor	Planned	Mixed-Use Corridor
Sonoma	Sebastopol: Core Area	Potential	Transit Town Center
Sonoma	Windsor: Redevelopment Area	Planned	Suburban Center

Total count: 191



Priority Development Areas

-  Priority Development Areas
-  Urbanized Areas

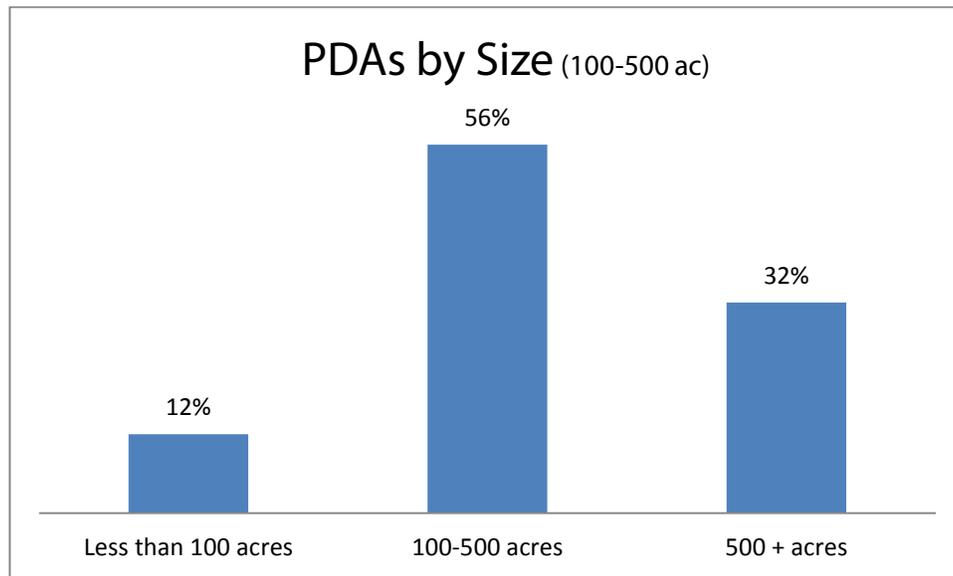


Summary PDA Criteria/Guidelines Table

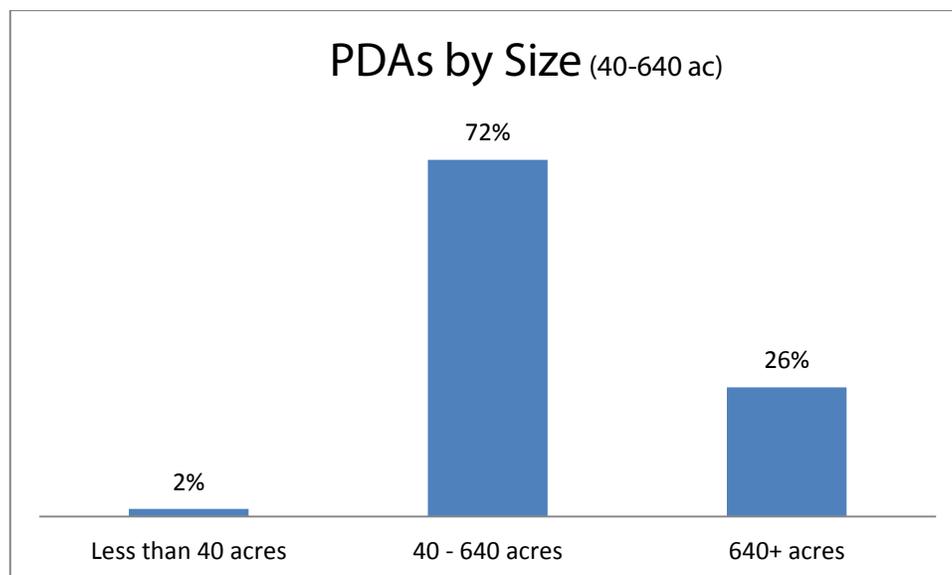
		EXISTING	RECOMMENDED CHANGES		
PDA CRITERIA	Location	1) <u>Within an existing community</u> defined as: an urbanized area, or an area within an urban growth boundary limit	No Change		
		2) <u>Housing growth anticipated</u> defined as: a community actively planning or considering to increase housing growth demonstrated by the jurisdiction's general plan, housing element, or via a specific planning process			
		3) <u>Near transit</u> , within .5 miles of: a) an existing ferry terminal or rail station, b) an existing bus/BRT route with minimum 20 min peak weekday headways, or c) a planned transit station (MTC Resolution 3434)			
PDA GUIDELINES	Size (acres)	minimum: 100 ac	minimum: 40 ac		
		maximum: 500 ac	maximum: 640 ac		
		outliers: n/a	outliers: must conform to the boundaries of an existing community plan		
PDA GUIDELINES	Density (by placetype)	PDA Place Type	Housing Density Range (dwelling units per acre)	Employment Density Range (floor area ratio)	No Change
		Regional Center	75-300 du/ac	5.0 FAR	
		City Center	50-150 du/ac	2.5 FAR	
		Suburban Center	35-100 du/ac	4 FAR	
		Transit Town Center	20-75 du/ac	2 FAR	
		Urban Neighborhood	40-100 du/ac	1 FAR	
		Transit Neighborhood	20-50 du/ac	1 FAR	
		Mixed Use Corridor	25-60 du/ac	2 FAR	

PDA Size Graphs

Existing Guidelines



Proposed Guidelines





Date: October 1, 2014

To: Regional Planning Committee

From: Danielle Hutchings Mieler
Earthquake and Hazards Program Coordinator

Subject: **Advancing Bay Area Resilience: ABAG's Integrated Approach**

Introduction

This memo describes ABAG's integrated approach to resilience planning and the evolution of the earthquake program over forty years at ABAG. As our program grows and becomes more closely aligned with the planning work at ABAG, we are seeking to change the name of the earthquake program to the resilience program and request Regional Planning Committee support for the name change and proposed direction of the program.

The overview of the program will be followed by an overview of current and future resilience projects focusing on housing, infrastructure, and regional resilience planning. The memo describes how these projects will inform the resilience component of Plan Bay Area. Finally this memo outlines a proposed regional policy agenda for the 25th anniversary of the Loma Prieta Earthquake and asks the Regional Planning Committee to recommend adoption of these policies. The policies are the foundation of a policy symposium planned to commemorate the earthquake and look towards future resilience building efforts.

Integrated Planning Approach

ABAG has been involved in hazards identification and risk mitigation planning since 1974. ABAG's contribution to hazard reduction has focused on convening local governments to jointly plan, share best practices, and develop regional assessments to build resilience. Staff develops and disseminates scientific information in understandable and accessible ways to facilitate good policy and planning decisions, provides model policies and programs for local governments to implement mitigation and recovery plans, and improves seismic resilience of housing through improved retrofits, better enforcement of codes, training and education, and financial incentives. In partnership with member cities and counties, ABAG contributes to the region's capacity to leverage climate and disaster resilience initiatives.

As the Earthquake Program celebrates forty years at ABAG, we examine our evolution and look forward to the future. In recent years this program has moved from a single focus on earthquake hazards towards examining the interaction between multiple hazards, and we think about natural hazards in an integrated way alongside other quality of life and sustainability planning activities. The program has begun to take a deeper dive into community and neighborhood scale planning and developing close partnerships with member cities and counties to implement strategies and best practices that have been identified over the previous decades.

In recent years, the concept of resilience as an encompassing framework for examining multiple hazards, their relationship to the broader region has begun to take hold. Beyond the traditional approach to natural hazards management, resilience depends not only on protecting assets, but building communities that prosper and thrive in the face of ongoing stressors and unexpected shocks. This broader framework helps us understand that the planning work we do at ABAG not only improves quality of life for Bay Area residents, but it improves our resilience as well.

With this shift to an integrated planning approach and in celebration of forty years of natural hazards planning, it is appropriate to change the name of the Earthquake and Hazards Program to the Resilience Program to better capture the breadth of our work and its relationship to other major regional planning initiatives under way. The pillars of this program are **research, planning, and action for a resilient Bay Area.**

Current and Future Resilience Projects

Staff will present the key findings and lessons from current resilience projects. Aspects of these projects demonstrate our integrated planning approach and will inform development of a Regional Resilience Plan, recently funded by FEMA. This plan will assist member cities and counties to update their local hazard mitigation plans and provide an opportunity for local planning that incorporates the strategies developed in recent ABAG resilience projects. The three year Regional Resilience Plan will be the primary vehicle for integrating resilience into the next update of Plan Bay Area.

Housing and Community Risk Project

The Bay Area Housing and Community Multiple Hazards Risk Assessment is a multi-agency project designed to understand the characteristics of San Francisco Bay Area housing and communities that increase vulnerability to earthquakes and flooding, identify and assess housing and community vulnerability at regional and community scales. The outcome of the project is a suite of strategies that reduce housing and community vulnerability to help the region meet resilience, sustainability, prosperity, and equity goals. This project addresses the intersection between vulnerable communities and fragile housing. It explores ways to avoid placing the burden of hazard vulnerability on already vulnerable populations while still meeting ambitious growth and sustainability goals throughout the region. (See attachment 1)

Infrastructure Resilience Project

The Infrastructure Resilience Project maps regional airports, transportation (highways & passenger rail), fuel, electricity, and water systems, and highlights their interaction with seismic hazards. The study illustrates how the systems operate and the potential consequence should the system be damaged. The key findings warrant keen attention from local, regional, and state actors to understand the regional impacts of damage to infrastructure systems and the interactions among systems. Key system vulnerabilities are identified to the region's fuel and transportation systems. (See attachment 2)

Regional Resilience Plan

Starting this fall, ABAG is planning the development of a Regional Resilience Plan which will combine a number of regional planning processes under a single umbrella to support long-term sustainability and livability. It is useful to consider integration of a Local Hazard Mitigation Plan, regional Climate Adaptation Plan (as successfully done in Baltimore), climate mitigation planning, and energy and resource conservation plans. Such a combined plan could be a comprehensive Regional Resilience Plan for the Bay Area. The Regional Resilience Plan would be one of several avenues to support the long-term regional vision laid out in ABAG's Plan Bay Area. Community goals to foster a sustainable, resilient Bay Area cannot be achieved without adequately addressing the hazards and risk that threaten the region.

Loma Prieta 25th Anniversary Policy Symposium

The 1989 Loma Prieta earthquake galvanized the region to make community safety an essential priority. The lives lost and communities damaged spurred the entire Bay Area – city by city, neighborhood by neighborhood – to organize for better emergency response, rebuild essential buildings and utility systems, and embed resilience into public policies and programs.

In the last 25 years, much action has been taken to improve regional resilience and bring communities together. But there is still more to do. With the anniversary of Loma Prieta, the Bay Area has a day in which to honor the past and remember those who were lost and celebrate the ways in which our cities rebounded in the wake of the disaster. But we also have an opportunity to look forward, and inaugurate planning for the next 25 years to renew our commitment to community resilience and build on the exemplary progress we have made together.

Symposium sponsors hope to inspire action required to improve the resilience of Bay Area communities. Meeting stakeholders will promote a public policy program to make the region more earthquake-safe by:

- Enacting statewide guidelines for the identification, evaluation, and retrofit of seismically unsafe soft-story apartment buildings;
- Developing a financial incentive program to promote seismic retrofit efforts for vulnerable soft-story apartment buildings;
- Encouraging cities to adopt building code improvements tailored for each community to ensure that building codes meet community performance expectations, and;
- Convening an alliance of utility, cities and regional agencies to examine disruption risks to regional utility systems, further assess system connections, and develop a regional strategy to foster lifeline resilience.

Symposium planning has been a collaborative effort bridging across many organizations. A steering committee has met since March 2014 to plan the day's discussions and engage leading-edge experts, cities, regional, state and federal agencies in a dialogue about the Bay Area's future. Multiple subcommittees have also devoted significant time and effort into planning every aspect of this event. Over the coming three years ABAG staff will continue to work with these partner organizations to advance these policies in alignment with ongoing work in Southern California. (See attachment 3)

Recommended Action

Staff recommends that the ABAG Regional Planning Committee:

- Support new resilience program and future direction.
- Recommend that ABAG Executive Board adopt the regional resilience policies promoted through the Loma Prieta 25th Anniversary policy symposium.

Attachment(s)

Attachment 1: Bay Area Housing and Community Multiple Hazards Risk Assessment

Attachment 2 : Infrastructure Resilience Overview

Attachment 3: Draft State and Regional Legislative Policy Agenda

Bay Area Housing and Community Multiple Hazards Risk Assessment

Introduction

The Bay Area Housing and Community Multiple Hazards Risk Assessment is a multi-agency project designed to understand the characteristics of housing and communities that increase their vulnerability to earthquakes and flooding. The assessment identifies and assesses housing and community vulnerability at regional and community scales, and develops strategies that reduce housing and community vulnerability to help the region meet resilience, sustainability, prosperity, and equity goals.

Previous research by ABAG found that a crucial factor of the region’s successful and speedy recovery from a seismic or flood event was keeping people in their homes. Multiple studies have shown that population loss after a disaster significantly slows recovery time. Fundamental to retaining residents is keeping housing intact. In the Bay Area, much of the older, more affordable housing stock is vulnerable to disasters. Housing rebuilding can take years and many residents may not have the resources to stay and rebuild if their homes are significantly damaged. Past disasters have also demonstrated that low-income or rental housing often gets demolished and rebuilt as market rate housing, permanently changing community and regional demographics. A key first step in improving regional resilience is to better understand the vulnerability of existing housing.

Not only is much of the region’s housing vulnerable, but vulnerable community members such as the elderly, low income residents, people without automobiles, or renters may lack access to the information and services, financial means, or physical capacity to prepare for and recover from hazard events. The problem is significantly exacerbated when communities with these characteristics live in weak housing stock. As the Bay Area grows, policies for housing and community resilience are needed where locally designated areas of focused growth, known as Priority Development Areas (PDAs), are at risk.

Vulnerability Assessment

Hazard Level

The three hazards under consideration are presented below. Each hazard has one or more level that will result in different amounts of impact on housing or communities.

Hazard	Level
Ground Shaking	MMI VIII or above
Liquefaction	Moderate Hazard
	High Hazard
Flooding	Current 100-year flood zone
	Future, sea level rise = 24”
	Future, sea level rise = 36”
	Future, sea level rise = 48”

Seismic Hazards – Liquefaction and Ground Shaking

Ground shaking hazard levels were determined using two earthquake scenarios – a M 7.8 on the San Andreas fault and a M 7.0 on the Hayward fault. Previous research¹ indicates a significant threshold for housing damage (the number of homes likely to be red-tagged) at MMI VIII and above.

Liquefaction hazard areas were determined based on liquefaction susceptibility² combined with MMI using the correlation table below.³ For the purpose of this project, we examined any Moderate or High liquefaction hazard areas from the two scenarios outlined above (a San Andreas or Hayward event) as they are the most likely to cause significant building damage.

¹ Shaken Awake! Estimates of Uninhabitable Dwelling Units and Peak Shelter Populations in Future Earthquakes Affecting the San Francisco Bay Region, ABAG, 1996

² USGS Open-File Reports 00-444 and 2006-1037

³ The Real Dirt on Liquefaction, A Guide to the Liquefaction Hazard in Future Earthquakes Affecting the San Francisco Bay Area, ABAG, 2001

Bay Area Housing and Community Multiple Hazards Risk Assessment

MMI Value	Liquefaction Susceptibility Category		
	Moderate	High	Very High
VII – Strong			Moderate Hazard
VIII – Very Strong	Moderate Hazard	Moderate Hazard	Moderate Hazard
IX – Violent	High Hazard	High Hazard	High Hazard
X – Very Violent	High Hazard	High Hazard	High Hazard

Flooding Hazards

Current flooding is based on published National Flood Insurance Program (NFIP) rate maps. Future flooding is based on a three inundation maps that represent different combinations of sea level rise and tide levels, including the daily high tide (mean higher high water, MHHW) and a wide range of extreme tides due to coastal storm surge. The possible combinations are shown below:

Sea Level Rise*	Water Level above MHHW	Extreme Tide Level						
		1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
+0	0	12	18	24	30	36	42	48
+6	6	18	24	30	36	42	48	54
+12	12	24	30	36	42	48	54	60
+18	18	30	36	42	48	54	60	66
+24	24	36	42	48	54	60	66	72
+30	30	42	48	54		66	72	78
+36	36	48	54	60	66	72	78	84
+42	42	54	60	66	72	78	84	90
+48	48	60	66	72	78	84	90	96

* All values in inches above MHHW (NAVD88)

Table Map Key

Color Code	Map Scenario (inches above MHHW)
	24
	36
	48

Bay Area Housing and Community Multiple Hazards Risk Assessment

Housing Vulnerability

Housing vulnerability is based on the fragile building typologies tool which identifies locations of potentially vulnerable housing based on known combinations of indicators for vulnerability, including hazard, location, units, stories, and age that are associated with 8 building types commonly found in the Bay Area. Housing vulnerability is indicated if 30% or more of housing units in a block group fit the criteria for a fragile building type. See Appendix A for more detail on housing indicator development.

Hazard	Fragile Building Type	Concentration of Fragile Housing
Ground Shaking MMI XIII or above	Hillside	>30%
	Single family cripple wall	>30%
	Single family house over garage	>30%
	Unreinforced masonry	>30%
	Multi-family cripple wall	>30%
	Multi-family weak story or open front	>30%
	Multi-family non-ductile concrete	>30%
Moderate Liquefaction Hazard	Insufficient foundation to withstand liquefaction	>30%
High Liquefaction Hazard		>30%
Current flood zone	All housing types	>30%
Future flooding with sea level rise		>30%

Community Vulnerability

Community vulnerability is based on ten (10) selected indicators that are feasible and appropriate for application at the regional scale. Indicators were selected based on regionally relevant research and best professional judgment. Indicators were measured and scored using the approach developed by the Metropolitan Transportation Commission (MTC) to identify Communities of Concern (CoC). Individual block groups receive 1 point for each indicator that is greater than the indicator-specific level of significance. For example, block groups with greater than 10% of individuals over 75 years would receive a score of 1. The total score for each block group ranges from 0 to 10. See Appendix A for more detail on community indicator development.

Indicator	Measure	Level of Significance	Score
Housing cost burden	% household monthly housing >50% of gross monthly income	>15%	1
Transportation cost burden	% household monthly transportation costs >5% of gross monthly income	>15%	1
Home ownership	% not owner occupied housing	Mean + 1 standard deviation	1
Household income	% households with income less than <50% AMI	>30%	1
Education	% persons without a high school diploma > 18 years	Mean + 1 standard deviation	1
Racial/Cultural Composition	% non-white	>70%	1
Transit dependence	% households without a vehicle	>10%	1
Non-English speakers	% households where no one ≥ 15 speaks English well	>20%	1
Age - Young children	% young children < 16 yrs	>25%	1
Age – Elderly	% elderly, > 75 years	>10%	1
Total Possible Score			10

Applying Indicators Together

There are different ways to combine hazards, housing, and community vulnerability to inform a regional understanding of the ability to prepare for, respond to, and recover from earthquakes and flooding due to sea level rise and storm events. Below are the combinations of these characteristics that we mapped and what we anticipate they will show us.

Regional Scale Screening

Hazard(s)	=	Areas potentially exposed to ground shaking, liquefaction, current and future flooding				
Hazard(s)	+	Community Vulnerability	=	Communities At Risk	Communities exposed to hazards that are less able to prepare, respond and recover	
Hazard(s)	+	Vulnerable Housing	=	Fragile Housing	=	Housing that will likely be damaged if exposed to a hazard
Community At Risk	+	Fragile Housing	=	Communities At Risk in Fragile Housing	=	Communities that are less able to prepare, respond and recover that are potentially living in fragile housing

Maps showing communities at risk, fragile housing, and communities at risk in fragile housing are shown on the following pages.

The team also developed Community Profiles of eight Bay Area communities that exhibit unique combinations of hazards, housing vulnerability, community vulnerability, and areas designated for future housing growth. Through meetings with the designated jurisdictions, more detailed vulnerability profiles were developed on these eight communities and assumptions about the presence of fragile housing types and community vulnerability were ground-truthed at a more detailed scale. These profiles also helped the team refine hazard mapping and better understand qualitative factors that affect community resilience, such as community groups and community cohesion.

The assessment phase can be summarized by the following key vulnerability statements (see Appendix B for more detailed explanation of each vulnerability statement):

- Ground shaking can damage cripple wall and house-over-garage single-family homes
- Ground shaking can damage weak story, concrete and cripple wall multi-family housing
- Housing is generally built to life safety rather than shelter-in-place standards
- Most foundations cannot withstand liquefaction
- Most houses cannot withstand any amount of flooding
- Houses with habitable space or critical equipment below-grade are at risk from flooding
- Many community members have limited access to resources
- Housing affordability is an existing challenge that could hinder recovery
- Renters have limited ability to improve their housing resilience
- Many community members have limited or inadequate information about hazards
- Information on elderly and very young community members is limited

Strategy Development

The next step of the project was to develop policy and planning strategies as well as implementation options that can help local jurisdictions address the identified vulnerabilities that were responsive to the outcomes of the assessment step. Strategies encompass policy, planning, coordination, education, and programmatic tools to decrease vulnerability and increase resilience in housing and communities. Strategies are twofold – those that are geared towards improving existing housing and community vulnerability and those geared towards safe and smart new growth in high hazard areas.

Thirty-nine strategies were developed for the project and range in type and level of implementation including strategies that will “unlock” or serve as prerequisites to other strategies; those that require state initiated research, regulations, or support; those that address issues that cross jurisdictions and therefore require or could benefit from regional coordination; strategies



that can be initiated locally; and those strategies best implemented in coordination with community based organizations and neighborhood nonprofits.

Strategies can address where to build to avoid highest hazard areas; retrofitting fragile housing in seismic areas; increasing building standards for new construction in seismic hazard zones; addressing flooding hazards for both existing and new housing; providing policy tools that can be used in conjunction with financing mechanisms identified and explained in the financing mechanism table also developed for this project to assist with costs associated with hazard abatement; pre-disaster planning for recovery; and building community capacity.

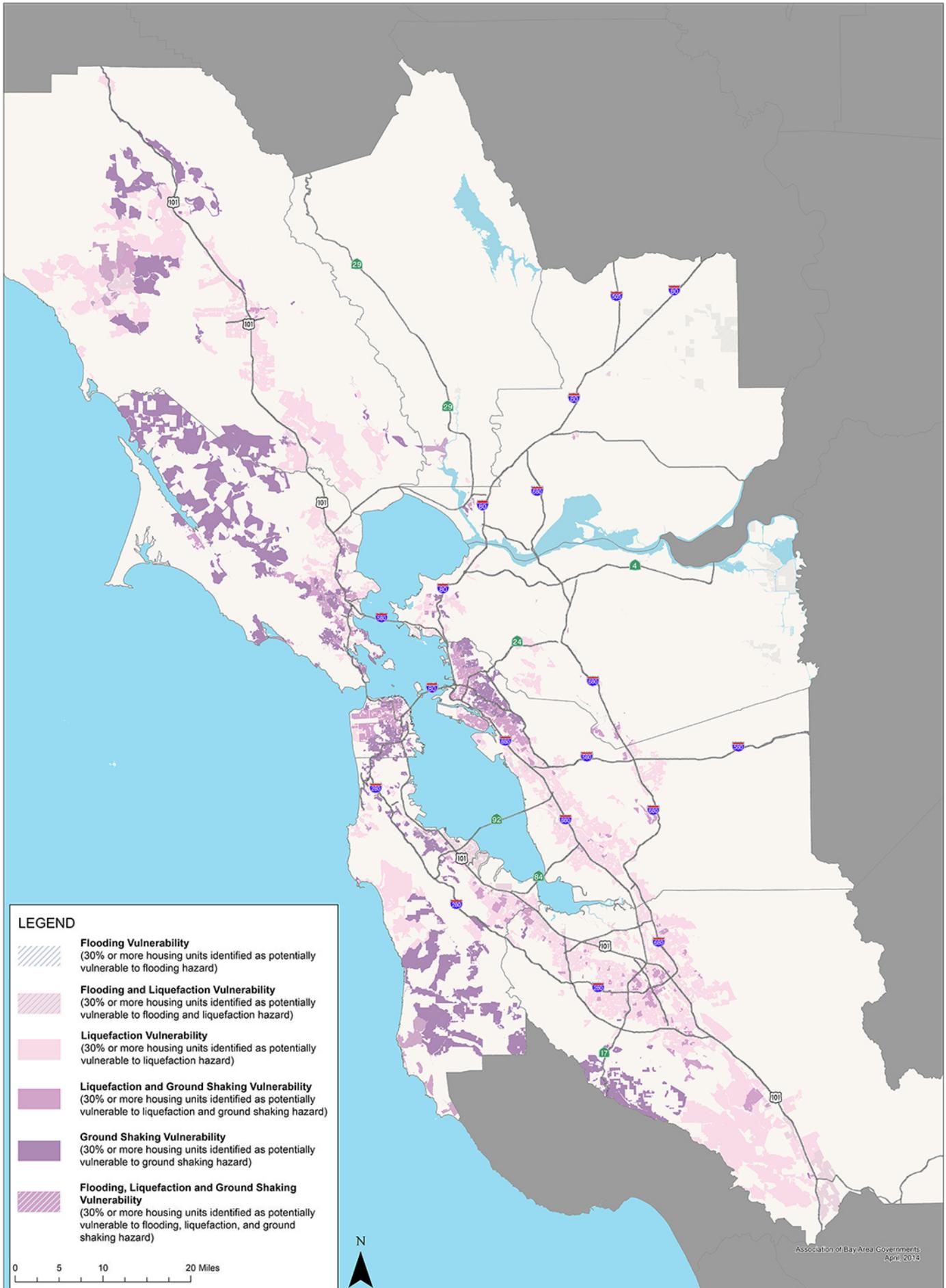
Strategies will be disseminated by EPA, ABAG, and BCDC to local jurisdictions. The strategies will be supported by ABAG's Regional Resilience Plan (Multi-Jurisdictional Hazard Mitigation Plan update), scheduled to be adopted in March 2016. The assessment and strategies will also be incorporated into the next Plan Bay Area, the region's long-range integrated transportation and land use strategy designed to reduce greenhouse gas emissions and meet the requirements of California's SB 375, which calls on each of the state's 18 metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas emissions through more efficient land use planning. The Bay Area's first Plan Bay Area was adopted in July of 2013. The complete list of strategies can be found in Appendix C.

Conclusions

This project uses a scalable, multi-jurisdictional, cross-discipline approach to assess and address the issues of planning for housing and community vulnerability to multiple hazards. Project participants and funding sources include The US Geological Survey (USGS), US Environmental Protection Agency (EPA), and Federal Emergency Management Agency (FEMA) as well as the California Strategic Growth Council (SGC). Two regional agencies, ABAG's Earthquake and Hazards Program and Planning and Research Department and BCDC's Adapting to Rising Tides program led the project. AECOM also provided significant support in the development of project strategies.

This project highlighted many issues previously unaddressed in the Bay Area. Primarily, the intersection between vulnerable communities and fragile housing was long suspected, but had never been made explicit. Resilience building should focus on this intersection as well as actively avoiding placing an undue burden of hazard vulnerability on already vulnerable populations while still meeting ambitious growth and sustainability goals throughout the region. Though this study exposed the particular vulnerability profile of housing and community within the Bay Area and developed a toolkit for how to address this vulnerability, much work remains in the realm of implementation. The ABAG/BCDC team is actively pursuing opportunities to make the work more meaningful to the 110 member cities and counties within the Bay Area.

BAY AREA HOUSING AND COMMUNITY MULTIPLE HAZARD RISK ASSESSMENT



LEGEND

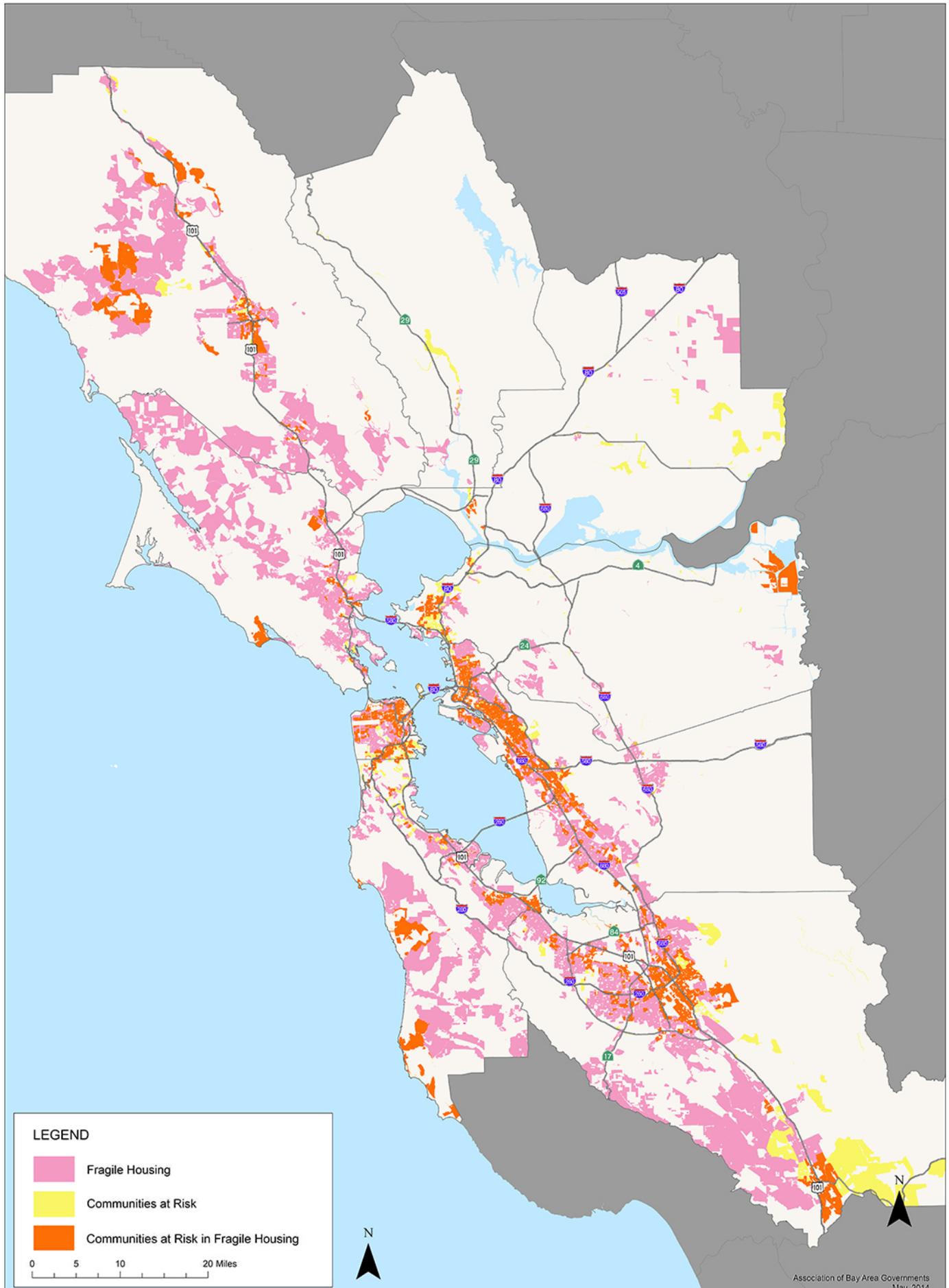
-  **Flooding Vulnerability**
(30% or more housing units identified as potentially vulnerable to flooding hazard)
-  **Flooding and Liquefaction Vulnerability**
(30% or more housing units identified as potentially vulnerable to flooding and liquefaction hazard)
-  **Liquefaction Vulnerability**
(30% or more housing units identified as potentially vulnerable to liquefaction hazard)
-  **Liquefaction and Ground Shaking Vulnerability**
(30% or more housing units identified as potentially vulnerable to liquefaction and ground shaking hazard)
-  **Ground Shaking Vulnerability**
(30% or more housing units identified as potentially vulnerable to ground shaking hazard)
-  **Flooding, Liquefaction and Ground Shaking Vulnerability**
(30% or more housing units identified as potentially vulnerable to flooding, liquefaction, and ground shaking hazard)

0 5 10 20 Miles



Association of Bay Area Governments
April 2014

BAY AREA HOUSING AND COMMUNITY MULTIPLE HAZARD RISK ASSESSMENT



LEGEND

- Fragile Housing
- Communities at Risk
- Communities at Risk in Fragile Housing

0 5 10 20 Miles

Association of Bay Area Governments
May, 2014

Item 7 Attachment 1

**Communities at Risk
in Fragile Housing**

earthquake and hazards program
Association of Bay Area Governments

Adapting to Rising Tides

Appendix A: Detailed Indicator Criteria Tables

Fragile Building Typologies Screening Tool

This fragile building typology is designed only to narrow down the residential building stock using regionally available data to indicate areas where vulnerable building types may be found. This tool screens only what we have deemed as the most fragile common housing structure types found within the Bay Area. These criteria are flagging only poor structural and geologic performance (i.e., those conditions most likely to be red-tagged and require either demolition or extensive and lengthy repairs), so we have flagged only characteristics that might point to typologies with broad building deficiencies, rather than calculated overstress in a particular structural element. This system considers critical *combinations* of material, system, etc. that indicate high fragility. As key data such as structure type (wood frame, concrete, etc.) is not available, we have used proxies such as size and location that are associated with the most common structural and geologic deficiencies.

These indicators are focused on housing stock only, and do not consider infrastructure and demographics. As different hazards interact with building types differently, we are dealing separately with geologic hazards including liquefaction, ground shaking, and flooding.

Hazard	Hazard Level	Location	Units ³	Stories ³	Age ^{3,4}	Conclusion	Notes
Ground Shaking	MMI VIII ² or above	Hillside	N/A	N/A	N/A	Possible landslide hazard	Hillside homes may also have structural damage due to ground shaking
		Not hillside	1-2 unit	N/A	Built before 1940	Possible cripple wall	Bedroom communities, rare in city centers and dense suburbs ¹ Older, more established regions such as SF, Napa, and Alameda counties ²
				2-3 stories	Built between 1920 and 1970	Possible house over garage	Dense pre-1950's suburbs like Western SF Post 1950's suburbs with attached multicar garages ¹ Highly prevalent in more recently urbanized areas such as Santa Clara and Contra Costa counties ²
			Multi-unit	3-5 stories	Built before 1920	Possible cripple wall	Pre-1920's neighborhoods ¹
		Built before 1933	Possible unreinforced masonry		1% of total regional housing stock, most significant in San Francisco and Alameda counties ²		
		Built before mid-1970s	Possible weak story or open front		Pre-1950: mixed or high density suburban neighborhoods (Berkeley,		

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							SF) Post-1950: also found in large subdivision developments (Fremont, Hayward) ¹ Pre-1940: Significant in older cities – over 10% in SF Post-1940: Fairly prevalent, especially in San Mateo county ²
				3 stories or above	Built between 1950 and 1971	Possible non-ductile concrete	High-density suburban neighborhoods ¹
Liquefaction	Moderate or High Hazard	N/A	N/A	Less than 10	N/A	Possible catastrophic foundation damage	Structural irregularities may also influence performance of buildings in liquefaction areas. New construction may follow new guidelines to limit these irregularities; more research is needed
Flooding	24”, 36”, or 48” flooding or FEMA 100-year flood plain	N/A	All	All	All	Possible loss of habitability after flooding	Mobile homes may be more susceptible to significant damage; however mobile home data is difficult to find at a regional level. Wave action may also influence damage.

¹David Bonowitz notes, 1/21/14

²Shaken Awake! Estimates of Uninhabitable Dwelling Units and Peak Shelter Populations in Future Earthquakes Affecting the San Francisco Bay Region, ABAG, 1996

³County Assessor Data

⁴American Community Survey

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Community Risk Vulnerability Indicators

Dimension of Vulnerability	Measure	Thresholds	Level of significance	Data Source	Data Scale	Effect on Vulnerability	Type of Action Informed: Prepare Respond Recover	Reference	Score
<i>Household Capacity</i>									
Housing cost burden	% households monthly housing costs relative to income	>50% of gross monthly income	>15%	U.S. Census Bureau, 2006-2010 American Community Survey 5-Year Estimates	Block group	↑	Prep, Resp, Rec	2, 4, 7, 8	1
Transportation cost burden	% households monthly transportation costs relative to income	>5% of gross monthly income	>15%	Metropolitan Transportation Commission; U.S. Census Bureau, 2006-2010 American Community Survey 5-Year Estimates	Census tract	↑	Prep, Resp, Rec	8 (pgs 6-10)	1
Home ownership	% non-owner occupied housing	N/A	Mean - 1 standard deviation	U.S. Census Bureau, 2010 Census, Summary File 1	Block group	↓	Prep, Resp, Rec	1, 2, 3, 6, 7	1
<i>Socioeconomic Status</i>									
Household income	% households with income less than <50% AMI (RHNA)	N/A	>30%	U.S. Census Bureau, 2006-2010 American Community Survey 5-Year Estimates	Block group	↑	Prep, Resp, Rec	1, 3, 8	1
Education	% persons without a high school diploma > 18 years	N/A	Mean + 1 standard deviation	U.S. Census Bureau, 2006-2010 American Community Survey 5-Year Estimates	Census tract	↓	Prep, Resp, Rec	1, 2, 3, 6, 7	
<i>Community Capacity</i>									
Racial/Cultural Composition	% non-white	N/A	>70%	U.S. Census Bureau, 2010 Census, Summary File 1	Block group	↑	Prep, Resp, Rec	7, 8	1
<i>Information and Mobility Challenges</i>									

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Transit dependence	% households without a vehicle	N/A	>10%	U.S. Census Bureau, 2010 Census, Summary File 1	Block group	↑	Prep/Resp	1, 3, 5, 7, 8	1
Non-English speakers	% households where no one ≥ 15 speaks English well	N/A	>20%	U.S. Census Bureau, 2010 Census, Summary File 1	Block group	↑	Prep/Resp	1, 3, 6, 8	1
Age - Young children	% young children < 5 yrs	N/A	Mean + 1 standard deviation	U.S. Census Bureau, 2010 Census, Summary File 1	Block group	↑	Prep/Resp	3, 6, 7, 8	1
Age - Elderly	% elderly, > 75 years	N/A	>10%	U.S. Census Bureau, 2010 Census, Summary File 1	Block group	↑	Prep/Resp	3, 6, 7, 8	1

- 1) Cumulative Impacts: Changing Regulatory Culture to Address Environmental Injustice and Environmental Racism, Communities for a Better Environment, 2009
- 2) Resilience Capacity Index, Kathryn A. Foster, University of Buffalo Regional Institute, State University of New York, <http://brr.berkeley.edu/rci/>
- 3) Mapping Our Future: A work plan for public engagement & equity in Climate Adaptation Planning in the San Francisco Bay Area, Bay Localize for the Joint Policy Committee, 2013
- 4) STAR Community Rating System, Version 1.0, October 2012 (subset of objectives and measurable outcomes)
- 5) California Department of Public Health (CDPH) Climate Health Indicators
- 6) Cumulative Impact Indicators, Equity Issue Brief: Advancing Environmental Justice through Sustainability Planning, Pastor et al. for the Sustainable Communities Initiative
- 7) Life and Death from Unnatural Causes, Health and Social Inequity in Alameda County, Aug. 2008
- 8) MTC Communities of Concern



Appendix B: Key Issue Statements

Key issue: Ground shaking can damage cripple wall and house-over-garage single-family homes

Many established residential neighborhoods have single-family homes that could be significantly damaged during an earthquake. These include homes with short unreinforced walls that raise the first floor 1-5 feet above ground level (i.e., cripple walls) and those that are two or more stories with garages or other large openings on the first floor. Renters and owners of single-family homes that are not retrofit, and those that do not have hazard insurance, may be displaced from their existing neighborhood and could have a difficult time rebuilding or finding a replacement home. Some residents may also struggle to find housing that is affordable near the jobs, schools, medical facilities, and other services they rely on. (Strategies: 1-4, 8, 12, 18-22, 40)

Key issue: Ground shaking can damage weak story, concrete and cripple wall multi-family housing

There are a number of multi-family housing types that can collapse if not properly retrofit. This includes those with parking or retail on the ground floor (i.e., weak story or open front), that are built from concrete that is not properly reinforced (i.e., non-ductile), or those that have short unreinforced walls that raise the first floor 1-5 feet above ground level (i.e., cripple walls). Depending on the number of units, damage to multi-family housing can displace a large number of residents that may then struggle to find housing that is affordable near jobs, schools, medical facilities, and other services they rely on. In addition, multi-family housing does not always receive an equitable share of state or federal financial and technical assistance during recovery efforts and therefore may not always be rebuilt in a timely manner. (Strategies: 1-4, 8, 12, 18-22, 40)

Key issue: Housing is generally built to life safety rather than shelter-in-place standards

Newly constructed housing built to life safety standards can still be damaged during an earthquake. For example modern building codes generally do not address liquefaction risk since it is not a life safety consideration. The result is that some residents will not be able to shelter-in-place or remain in their homes, and that extensive repairs or rebuilding may be required. (Strategies: 23-27, 37)

Key issue: Most foundations cannot withstand liquefaction

Homes located where soils are susceptible to liquefaction, for example along the Bay shoreline or on fill, may experience significant enough damage during an earthquake to become uninhabitable. Most single- and multi-family homes under 10 stories are unlikely to have foundations stable enough to withstand liquefaction even if they can withstand ground shaking. (Strategies: 1-3, 12, 24)

Key issue: Most houses cannot withstand any amount of flooding

If exposed to flooding, most housing built in the Bay Area will be damaged as current construction materials, siting and design standards do not consider potential exposure to either water or salt. As sea level rises existing and future housing of all types within FEMA identified Special Flood Hazard Areas (SFHAs) will be at greater risk of flooding, and housing in low-lying areas not currently at risk may begin to experience flooding. (Strategies: 1-3, 28-32)

Key issue: Houses with habitable space or critical equipment below-grade are at risk from flooding

Homes with habitable living space or critical building equipment below-grade are likely to be significantly damaged by flooding. Neighborhoods with existing drainage issues, for example that experience street or basement flooding during current rainfall events or when groundwater levels are high, will be at even greater risk as the Bay rises. (Strategies: 1-3, 28-32)

Key issue: Many community members have limited access to resources

Many Bay Area residents that live in areas at risk from natural disasters are resource constrained. This includes households that are low and very low income, households of all income levels that are housing and transportation cost burdened, and transit dependent households that do not own a car. Resource-limited households are less able to prepare for natural disasters, and if displaced from damaged homes will likely struggle to find housing that is affordable and near to the jobs, schools, medical facilities, and other services they rely on. (Strategies: 5, 8, 35, 39, 40)

Key issue: Housing affordability is an existing challenge that could hinder recovery



Housing affordability for both renters and owners is an existing challenge in the Bay Area that will compound the number of community members displaced by a natural disaster. Much of the region is housing cost burdened already, spending 30% or more of income on housing. For others, the amount spent on housing is fairly stable either through rent-control policies or because they own their homes and their property tax burden is unchanging. Loss or damage of housing that results in increased costs to either renters or home-owners will likely increase the number of permanently displaced Bay Area residents as finding housing that is affordable and near jobs, schools, medical facilities, and other services they rely on will be challenging. (Strategies: 3, 5, 8, 35, 38, 40)

Key issue: Renters have limited ability to improve their housing resilience

Many Bay Area residents that live in areas at risk from natural disasters are renters. Renters have a limited ability to improve the housing they live in and often do not have hazard insurance to protect themselves and their belongings in case of a disaster. Communities with a large number of renters, and in particular resource-limited renters, will need to assist these residents both during a disaster, for example with shelter-in-place facilities, as well as post-disaster with finding interim, affordable housing to avoid the permanent displacement of renters from communities due to damaged housing. (Strategies: 3, 5, 8, 21, 37, 38)

Key issue: Many community members have limited or inadequate information about hazards

Access to timely, correct, and meaningful information both before and after a natural disaster can be challenging in all communities and can be a particular challenge in communities that are ethnically and culturally diverse, and where there is a large number of households where English is not the primary language spoken. Additionally, in the Bay Area many of these same community members are resource-constrained renters who are often living in overcrowded housing. Damage to housing during a natural disaster can lead to a significant amount of displacement and a struggle to find housing that is affordable and near enough to jobs, schools, medical facilities, and other services. (Strategies: 3, 39, 40)

Key issue: Information on elderly and very young community members is limited

Up-to-date and easily accessible information about the number of elderly and very young living in a community can be challenging to find, particularly during a disaster when it is most needed. It can be difficult to evacuate these community members, especially if they need specialized equipment or supervision, and shelter-in-place facilities need to be prepared to both house them safely and maintain communication with concerned family members. (Strategies: 3, 35, 37, 39, 40)

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Appendix C: Housing and Community Risk Draft Strategy List

Scale	#	Strategy Name	Strategy Snapshot
<p>The following strategies involve complex research or regulations that require initiative or buy-in from the state. Local jurisdictions should be aware of issues that need to be guided by the state and support state action on these areas. These strategies are generally prerequisites for actions at the local level, or they greatly assist jurisdictions in developing and implementing specific actions.</p>			
S	1	Complete seismic hazard mapping of urban and urbanizing areas	The California Geological Survey (CGS) is encouraged to complete mapping of seismic hazard zones for the portions of the Bay Area that are not currently mapped or in the process of being mapped with priority given to urban and urbanizing areas.
S	2	Evaluate current guidelines and the “state of practice” for mapping, evaluating and mitigating seismic hazards, particularly multi-hazard areas	Through its authority under the State Seismic Hazard Mapping Act, encourage the California Geological Survey (CGS) to work with regional and local agencies and the geology/geotechnical community in the Bay Area to evaluate current guidelines, as well as the current state of practice, for mapping, evaluating and mitigating seismic hazards, particularly in areas of expected growth that are also vulnerable to tsunami, flooding and permanent inundation.
S	3	Develop education program(s) to encourage homeowners and renters to purchase of hazard insurance	Create targeted education programs that encourage homeowners and renters to better understand their risk and make more informed decisions about the purchase of earthquake and flood insurance. This includes education about retrofitting versus insurance, understanding the site-specific hazards of their building, helping them understand what the costs versus benefits are of purchasing insurance, and what is and is not covered by hazard insurance policies.
S	4	Improve the quality assurance of non-engineered retrofits by developing a statewide retrofitting license for contractors	Increase the number of skilled contractors, contractor knowledge, owner assurance and trust in their retrofit, and consistency in retrofit quality between jurisdictions by developing a statewide program to train and license contractors in seismic retrofits.
S	5	Protect affordable housing during recovery	Develop policies that protect affordable housing from being damaged by a natural disaster, mandate that affordable housing that is damaged be rebuilt as affordable housing, ensure funding streams are available for rebuilding damaged affordable housing, and encourage building new affordable housing to ensure that low-income residents are able to stay in the region.
<p>The following strategies require initiative greater than a single jurisdiction can provide because the issues extend beyond jurisdictional boundaries. In some cases, local action doesn’t make sense without regional cooperation or coordination. In many cases, this regional work will then spur community-specific actions at the local level with policy, assistance, or information-sharing.</p>			
R	6	Establish a cooperative shoreline management program	Coordinate between government agencies, organizations, and land owners to establish and maintain a cooperative shoreline management program. This cooperative program could identify strategies for shared decision making and funding to reduce current and future flood risks in a manner that benefits and balances issues of equity, economy, and environment.
R	7	Develop guidelines for the siting and design of transit stations and transit service to reduce transit disruptions	Metropolitan Transportation Commission (MTC), county congestion management agencies, local jurisdictions, and transit providers such as Bay Area Rapid Transit or the Water Emergency

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		after an event	Transportation Authority to work together or separately to develop guidelines for the siting and design of transit stations and transit service to reduce transit disruptions after a flooding or seismic event.
R	8	Encourage innovative insurance solutions at the state and federal levels, and in partnership with the private sector (all hazards)	Lobby and advocate for the expansion of state- and federally-mandated catastrophe insurance programs, such as the California Earthquake Authority. Better insurance solutions could enhance mitigation efforts by offering incentives such building permit rebates, lower premiums or deductibles for retrofitted homes, state-level tax incentives, and state and federal grants to fortify homes and business.
R	9	Advocate for changes to federal and state programs to improve multi-family rebuilding efforts	Lobby at the state and federal levels to ensure multi-family housing receive a fair and equitable share of financial and technical assistance during rebuilding and recovery efforts.
R	10	Decrease reliance on grid-supplied power	Lessen household energy demands on the grid through energy efficiency and/or on-site energy generation or storage to promote buildings that will maintain livable conditions in the event of extended loss of power or heating fuel. This can be done through incentives for residential energy efficiency retrofits, weatherization projects, building design standards that promote energy load reductions, and on-site generated electricity or bi-direction energy sources.
R	11	Host a regional “Smart and Safe” growth design competition	Develop a region-wide design competition to promote innovative approaches to design and build high-density, mixed-use community development or redevelopment in a safe and smart manner in areas that are susceptible to multiple hazards.

The following strategies can be initiated and implemented at a local jurisdictional level. In many cases, initiation and/or implementation would be easier, or advantageous to the region with coordination or assistance from a regional body such as ABAG; however this partnership is not a prerequisite for action.

The following strategy greatly benefits the efficacy of the following strategies and should be considered a prerequisite for strategies 12-23

L	12	Develop locally-specific seismic hazard maps	Develop locally-specific seismic hazard maps to improve upon mapping resolution, support more informed and nuanced decision making about development and hazard mitigation, and also consider the correlation of seismic hazards with other hazard related risks such as wildfire, tsunami, flood, and permanent inundation.
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The following strategies all address where to build to avoid the highest hazard areas. Strategies 14-17 provide specific actions that can be used to meet the goals of strategies 12 and 13. Strategy 11 should be used as a prerequisite to determine the highest hazard areas within a jurisdiction.

L	13	Increase protection of critical facilities and lifelines	Require critical infrastructure and public-service facilities to be located or relocated outside the high hazard areas, or that seismic- and flood-related mitigation and other protective measures be undertaken to enhance the structural integrity, overall performance, and functionality of facilities that must be located within high hazard areas through updating general and specific plans, zoning codes, development guidelines, and building codes. Emphasis should be given to ensuring the continuity of operations of critical facilities and lifelines essential to helping residents remain in their homes following a disaster and facilitating and expediting
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			community and regional post-disaster recovery.
L	14	Reduce or prohibit development of housing in the most hazardous areas while ensuring equity and beneficial use of these areas	Reduce or prohibit development in high hazard areas, incentivize relocation out of these areas, and reduce or prohibit rebuilding after a disaster. This strategy also works to create beneficial uses, such as open space, flood mitigation and recreation, for non-developable high hazard lands.
L	15	Establish overlay zoning districts to help facilitate safe and smart new development	Establish overlay zoning districts to cluster new development into lower hazard areas on a particular site while also establishing special conditions for development in high hazard areas.
L	16	Establish a Transfer of Development Rights program to redirect development from high hazard areas to preferred, low hazard areas	Amend local development codes to establish a Transfer of Development Rights (TDR) program, which could place permanent conservation or hazard mitigation easements on properties in high hazard areas, to prevent or minimize the vulnerability of new development to seismic and flood hazards.
L	17	Adopt Community Benefit Agreement policies to ensure more resilient communities	Adopt policies requiring Community Benefits Agreements (CBAs), which are legally binding contracts with developers that set forth tangible benefits a community will receive from a development/redevelopment project, as a tool to improve community resilience and capacity to recover from a disaster. These benefits might include construction of parks or public gathering spaces, community health or medical facilities, shelter in place facilities, etc.
<p><i>The following strategies address the retrofit of fragile housing in seismic hazard areas. Strategy 11 should be considered a prerequisite to identify high hazard areas, and strategy 17 should be considered a prerequisite for strategies 18 and 19. Strategies 18 and 19 should be considered prerequisites for strategy 20, as locally appropriate.</i></p>			
L	18	Create a fragile housing inventory	Create and maintain a database that includes the type and location of fragile housing by building type and housing tenure (owner vs. renter), and the property's retrofit status. This would include developing and sustaining standardized, transferrable procedures for collecting and managing data. The inventory should contain, at a minimum, unreinforced masonry buildings, soft-story buildings, and non-ductile concrete buildings.
L	19	Develop soft story retrofit program	Develop a retrofit program to address soft story housing in areas where it makes up a significant of a jurisdiction's housing stock. Pair programs with financing tools and incentives. Consider different incentives and financing tools for more vulnerable communities, such as low-income residents or renters.
L	20	Develop cripple wall retrofit program	Develop a retrofit program to address cripple wall housing in areas where it makes up a significant of a jurisdiction's housing stock. Pair programs with financing tools and incentives. Consider different incentives and financing tools for more vulnerable communities, such as low-income residents or renters.
L	21	Require hazard disclosure for renters	Develop policies that require residential property managers and landlords to disclose hazard risk information to renters in a manner similar to that required when residential properties are sold, as well as information about whether the property is included in a fragile housing inventory.
L	22	Expand requirements triggered by	Develop and adopt special repair and upgrade standards for existing buildings that are not typically part of hazardous building

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		major upgrades and repairs to existing buildings to address seismic and flood-related hazards.	abatement programs and are also potential candidates for conversion to mixed-use or higher-density residential use in areas of expected growth. This strategy focuses on reducing the risks posed by existing hazardous buildings by addressing both seismic and flood-related hazards at the time of upgrade (such as a mixed-use or residential conversion) or major repairs following a disaster.
<p><i>The following strategies aim to increase the building standards for new construction in seismic hazard zones. Strategy 11 should be considered a prerequisite to identify high hazard areas, and is especially crucial for strategies 22 and 23. In some cases, these strategies may also apply to major renovations of existing buildings.</i></p>			
L	23	Assign higher seismic importance factor to new large scale residential buildings.	Amend the local building code to enhance structural and nonstructural design requirements for new large scale residential buildings by adoption of increased seismic Importance Factor to improve their seismic performance level.
L	24	Enhance minimum design requirements for new small scale residential building foundations in liquefaction zones	Amend the local building code to require enhanced foundation design requirements for new small-scale residential development (e.g. single or two-family dwellings) as well as for significant modifications to existing small-scale residential development in order to limit foundation damage due to liquefaction.
L	25	Restrict use of significant structural irregularities in residential buildings	Amend the local building code to restrict the use of structural irregularities in the design of new residential construction as well as existing residential construction subject to significant modification in areas with high or moderate shaking and liquefaction potential.
L	26	Enhance minimum requirements for non-structural anchorage and bracing of interior partition walls in residential buildings	Amend the local building code to include enhanced non-structural anchorage and bracing requirements for interior partition walls in existing residential buildings in areas with shaking potential.
L	27	Require utility connections to buildings that accommodate displacement in earthquakes	Amend the local building code to require that utility connections to buildings have adequate allowance for displacement in earthquakes.
<p><i>The following strategies address flooding hazards and can be used to protect both existing and new housing.</i></p>			
L	28	Participate in FEMA's Community Rating System	Participate in FEMA's Community Rating System (CRS), a voluntary incentive program that recognizes and encourages community floodplain management activities which exceed the minimum National Flood Insurance Program (NFIP) requirements.
L	29	Reduce flood risk through integrated shoreline and watershed management	Develop a program to work with public and private landowners to decrease the risk of flooding by advancing engineered and nature-based shoreline protection improvement projects in coordination with watershed management projects that reduce and/or store runoff during rainfall events and improve the condition in the floodplain.
L	30	Increase standards in local floodplain management ordinances beyond the minimum requirements of FEMA's NFIP program	Adopt a floodplain management ordinance that exceeds the minimum requirements of the NFIP to reduce potential risk from flood events that exceed the 100-year (1% annual chance) event. A strong floodplain management ordinance will ensure that land use decisions more fully take into account current flood risks based on available information and assessments, as well as considering more extreme events and/or future flood risk that may accrue as sea level rises.
L	31	Require flood-proof construction methods and techniques within and	Amend general plans to require flood-proof construction techniques in structures in special flood hazard zones, high hazard zones, and

Bay Area Housing and Community Multiple Hazards Risk Assessment

		adjacent to SFHAs	adjacent areas. Requiring flood-proofing techniques in these special flood hazard and high hazard zones could reduce the potential of damage to structure and its contents the event of a flood. Requiring the same level of flood-proofing in areas adjacent to these zones could reduce the potential for damage in areas that may be flooded in the future with sea level rise, or by flood events that exceed the FEMA 1% annual chance (100-year) flood elevation.
L	32	Revise minimum building elevation standards and maximum building height-limits for new development	Revise building standards to require that habitable building space and sensitive building components be elevated above current and future flood levels. At the same time, maximum building height limits could be updated to reduce conflicts where these codes are applied together.
<i>The following strategies provide policy tools that can be used in conjunction with financing mechanisms laid out in the financing mechanism table to assist with costs associated with hazard abatement</i>			
L	33	Create geologic hazard abatement districts (GHADS) to fund hazard mitigation	Establish Geologic Hazard Abatement Districts (GHADs) as a mechanism for raising funds and defining responsibility for the prevention, mitigation, abatement or control of geologic hazards, including landslides, land subsidence, soil erosion, earthquake, fault movement or any other natural or unnatural movement of land or earth. GHAD related projects can include the mitigation or abatement of structural hazards that are partly or wholly caused by geologic hazards and they can include flood control structures. Once established, GHADs are an independent political subdivision of the State and have similar authorities as local governments, including: taxing and bonding ability, certain legal immunity, and an ability to exercise eminent domain.
L	34	Create Mello-Roos Community Facilities Districts to provide financing to property owners for resiliency improvements	Collaboration among local governments and property owners to form a district in which property owners opt in to participate, wherein the district would use capital raised by issuing bonds to make resiliency improvements, which is paid back through a property tax assessment.
<i>The following strategies are actions that jurisdictions can take place prior to a disaster that will assist in keeping residents in their homes after a disaster occurs. Many of the previous strategies that are aimed at limiting damage should be considered prerequisites for these strategies, as they will lessen the need for a protracted recovery experience.</i>			
L	35	Create a pre-disaster rebuild and recovery plan	Make decisions and implement as policy, such as when, where, and how rebuilding will occur after a natural disaster, which areas will be rebuilt according to existing plans and codes and which will be re-planned, whether rebuilt homes will be encouraged or required to be more likely to withstand the effects of future hazard events, and who will be in charge of coordinating and overseeing the recovery process through the development of a pre-disaster recovery plan.
L	36	Revise local plans and development codes to allow temporary land uses to facilitate and expedite post-disaster recovery	Revise local plans and development codes to permit interim or temporary land uses to support critical public facilities to facilitate and expedite recovery after a disaster event.
L	37	Develop and implement a shelter-in-place program	Develop a comprehensive shelter-in-place program to allow residents to remain in their homes after a disaster. Establish engineering criteria to determine shelter-in-place capacity, develop acceptable habitability standards for sheltering-in-place, and prepare and adopt regulations that allow for the use of these

Bay Area Housing and Community Multiple Hazards Risk Assessment

			standards in a declared housing emergency period. Also develop plans for implementing the program, such as public training materials, coordinating with post-disaster evaluation procedures, and setting up neighborhood support centers.
L	38	Ensure rental units are re-built after loss or damage from natural disasters	Develop policies to ensure that rental units damaged during a natural disaster are replaced in kind (with a similar number/type) during rebuilding and recovery rather than being converted to owner-occupied properties.
<i>The following strategies represent strategies that can be implemented most effectively with close coordination with neighborhood nonprofits and community organizations</i>			
N	39	Create a community capacity inventory	Develop a community capacity inventory by first defining the elements that should be included (such as critical facilities and community services), and then developing and sustaining standardized, transferrable procedures for collecting and managing data. Partnerships with NGOs such as Code for America could yield an open-source, collaborative format for collecting and sharing this information.
N	40	Disseminate best available hazard and climate risk information through community-based organizations and non-traditional partners	Seek opportunities to expand existing, successful community-based programs (e.g. programs on crime, blight, education or other important community issues) in order to better communicate hazard and climate risk information to community members.

ASSOCIATION OF BAY AREA GOVERNMENTS

Representing City and County Governments of the San Francisco Bay Area



ABAG

Date: October 1, 2014

To: Regional Planning Committee

From: Michael Germeraad
Earthquake & Hazards Specialist

Subject: **Infrastructure Resilience Overview**

This fall the Earthquake & Hazards program will release an Infrastructure Vulnerability and Interdependencies Study. The study provides a regional perspective of the transportation, fuel, electric, and water systems and their seismic vulnerability. This memo frames the motivation of the study. The attachment includes drafts of the study introduction, and a short chapter on Bay Area Airports.

The Bay Area region's resilience is largely dependent upon both building and infrastructure performance in seismic events. Our homes and businesses are only active when they are safe to be inside and when they are connected to the services they are reliant on: water, sewer, electricity, communications, natural gas, fuel, transportation. In an earthquake, building and infrastructure damage will be confined primarily to areas of strong shaking. Infrastructure outages will cascade outward beyond areas of strong shaking and liquefaction, impacting areas downstream of the failures. Infrastructure outages following an earthquake can impact the entire region at once. Some infrastructure repairs will be quick, while others will take months and years, leaving some communities without service for an unacceptable length of time.

The study maps airports, transportation (highways & passenger rail), fuel, electricity, and water systems, and highlights their interaction with seismic hazards. Publicly available information illustrates at a high level how the systems operate, and the potential consequence should the system be damaged. The report focuses on the seismic exposure of infrastructure systems and the significant consequences of failures. The key findings warrant keen attention from local, regional, and state actors.

Functional infrastructure systems are necessary for achieving community resilience. While it is unrealistic to expect systems to be earthquake proof, knowing what to expect provides the users of infrastructure systems the information they need to take measured preparedness actions. Currently the vulnerability of many publicly and privately operated infrastructure systems is not well known or not well communicated to the public. With a lack of information stakeholders have no baseline for predicting the benefits of possible preparedness or mitigation strategies. Going forward the region must understand and communicate the vulnerability of infrastructure systems to inform stakeholders on what to expect so that they can make informed decisions to limit their impacts should the system fail.

This study is a first step in understanding the risks to airports, transportation, fuel, electric, and water systems. The study should be used to inform actions in the present, and also as a call for greater attention of the regions infrastructure systems, and their impact on Bay Area Stakeholders.

CHAPTER 1

Introduction



Ground failures in the 1994 Northridge Earthquake.

A future large earthquake will impact the entire Bay Area region. Ground shaking near the fault and liquefaction of loose soils along the bay will cause severe damage to buildings and infrastructure systems in all nine counties that touch the Bay. Many homes and businesses will be severely damaged, displacing residents and businesses. Even in the largest scenarios individuals in seismically designed buildings or those not exposed to strong shaking will walk away with minimal damage to their home and workplace; however, they are likely to be severely impacted by infrastructure interruption. Damage to roads and water pipelines elsewhere will decrease the habitability of undamaged homes, close undamaged businesses, and test the operability of critical facilities like airports. A resilient region is reliant on functional infrastructure systems to keep key societal services operational to help damaged areas rebuild, to keep undamaged homes habitable, and businesses open during recovery. This report examines the interaction of

Bay Area infrastructure systems with seismic hazards and the interdependence between mutually dependent systems.

This work builds off of past Bay Area infrastructure studies:

- *Earthquake Engineering Research Institute: Scenario for a Magnitude 7.0 Earthquake on the Hayward Fault* (EERI, 2010)
- *Urban Areas Security Initiative: Regional Catastrophic Earthquake Logistics Response Plan, Appendix G Critical Lifelines* (UASI, 2014)
- *City & County of San Francisco Lifelines Council: Lifelines Interdependencies Study I* (2014)

It will also be joined by other similar work scheduled for release over the next 18 months:

- *FEMA Region 9: Bay Area Earthquake Plan*
- *USGS: Haywired*
- *City & County of San Francisco Lifelines Council: Regional Coordination of Lifelines Restoration Working Group*
- *City & County of San Francisco Lifelines Council: Post-Disaster Fuel*

Supplies Working Group

Infrastructure systems can be interrupted by any number of natural or manmade events. This study examines infrastructure systems through the lens of earthquakes. In past California earthquakes and recent global earthquakes infrastructure systems have been severely damaged, testing the resilience of regions. Earthquake hazards and three Bay Area earthquake scenarios are defined in:

- Chapter 2: Earthquake Hazards & Scenarios

While this assessment is focused on seismic events, the background research on each studied infrastructure system can be a resource to examine system performance in other hazard events.

The study draws from publically available data sets for each lifeline system, and when possible, provides a regionally complete perspective of the system. The information presented will be a useful tool for a number of Bay Area stakeholders, but Bay Area airports are the primary audience for this report. The 24 airports in the region are geographically distributed and are unlikely to all be damaged in a single event, but these regional air assets are all reliant on the same infrastructure systems which are vulnerable to interruption in a future earthquake. Airports and individuals are directly reliant on a number of publically and privately provided infrastructure services to maintain operability. The study focuses on:

- Chapter 3: Airports
- Chapter 4: Transportation - Roads & Passenger Rail
- Chapter 5: Fuel System
- Chapter 6: Electric System
- Chapter 7: Water System

This list is not a comprehensive review of all infrastructure systems but recognizes the limitations of a single study. Other systems deserving of future study are (freight rail, natural gas, waste water, communications, bio-fuels). In Chapters 3 through 7 individual systems are overlaid regional earthquake scenarios identified in Chapter 2. A seismic

vulnerability assessment of each system provides only an initial evaluation of system performance under earthquake loading.

Each system is dependent on other infrastructure systems which may have also been damaged. The interdependence between systems can result in cascading outages, an increased repair time, or can limit the utility of functional systems (i.e. functional roadways, but disrupted fuel system). Including study of the interdependence between lifeline systems reveals a more complete picture of system performance. These interactions are discussed in:

- Chapter 8: Interdependencies

GIS mapping, case studies, technical reports, planning documents, and interviews were used to develop profiles of the Bay Area's infrastructure. GIS was used to map infrastructure systems and hazards, highlighting features of interaction. This analysis by itself provides an infrastructure exposure analysis. When fragility attributes about the system were known the analysis was expanded to consider these features. Case studies of past earthquakes and earthquake engineering research were used to highlight components of each system that were most likely to fail in various seismic hazard loadings, and which system components were most likely to govern the restoration of each system. The likelihood of failure, time required to repair given failure, and consequence of failure were the attributes used to focus analysis on the most important system components. Lastly, interviews with experts who are familiar with the Bay Area's infrastructure and hazards provided additional knowledge into the past performance of infrastructure, their dependence on other systems, and expert guidance.

CHAPTER 3

Airports

KEY FINDINGS

- Airports are well distributed around the region.
- In San Andreas and Hayward scenario events the three international airports will simultaneously experience strong to violent shaking. 17 of 24 Bay Area airports are within five miles of an active Alquist-Priolo mapped fault, and 21 of 24 are within ten miles.
- Of the 16 airports that completed the Caltrans Division of Aeronautics Emergency Plan Survey, 15 have an Airport Emergency Plan, 13 of which have sections that cover earthquakes.

Bay Area airports provide residents and businesses the ability to travel and conduct business across the globe. The airports support the regional economy by providing airport sector jobs, economic access to domestic and global markets, air cargo services, and tourism access. Among the many important every day benefits of Bay Area airports, after a major earthquake they become key nodes to support both the response and recovery of the region. The accompanying report, *Roles of Airports in Regional Disasters* (2013) highlights the important resource airports provide in both short-term disaster recovery and long-term economic recovery of the Bay Area region.

In the Bay Area there are 24 public airports, three of which have international service. The airports are well distributed throughout the region, with airports in all counties except San Francisco and Marin. Eleven of the airports are within 1.5 miles of Highway 101 along the 175 miles between Cloverdale and San Juan Bautista. The majority of the airports in the region are classified by the FAA as supporting only medium to small aircraft (FAA, 2013). There are a number of factors that influence necessary runway lengths: wheel type, weight, site elevation, temperature, and others, but the FAA categorizes Bay Area airports as shown in Figure X.

HISTORIC SYSTEM PERFORMANCE

Airport facilities are susceptible to fault rupture, liquefaction, and ground shaking. Fault rupture and liquefaction can cause damage to runways requiring the re-grading and asphaltting of the runway. The above ground components of airports (terminals, hangers, air traffic control towers, etc.) are vulnerable to all three hazards. Damage to facilities can be both structural or non-structural. In many earthquakes structural damage can be minimal, but poorly anchored heating and cooling equipment, architectural elements, and mechanical systems can result in closure. The accompanying report *Roles of Airports in Regional Disasters* has nine case studies of recent domestic disasters, and international earthquakes and their impacts to airports. It also highlights the services these facilities can provide in both response and recovery for their regions.

BAY AREA VULNERABILITY ASSESSMENT

In the Bay Area there are two airports that have a known risk of fault rupture, Napa County Airport, and Buchanan Field. In the region there are 15 airports with portions of their facility in high or very high liquefaction susceptibility zones. The airports near the bay are especially susceptible, but many have taken some level of mitigative action to address the liquefaction potential. An accompanying study to this report

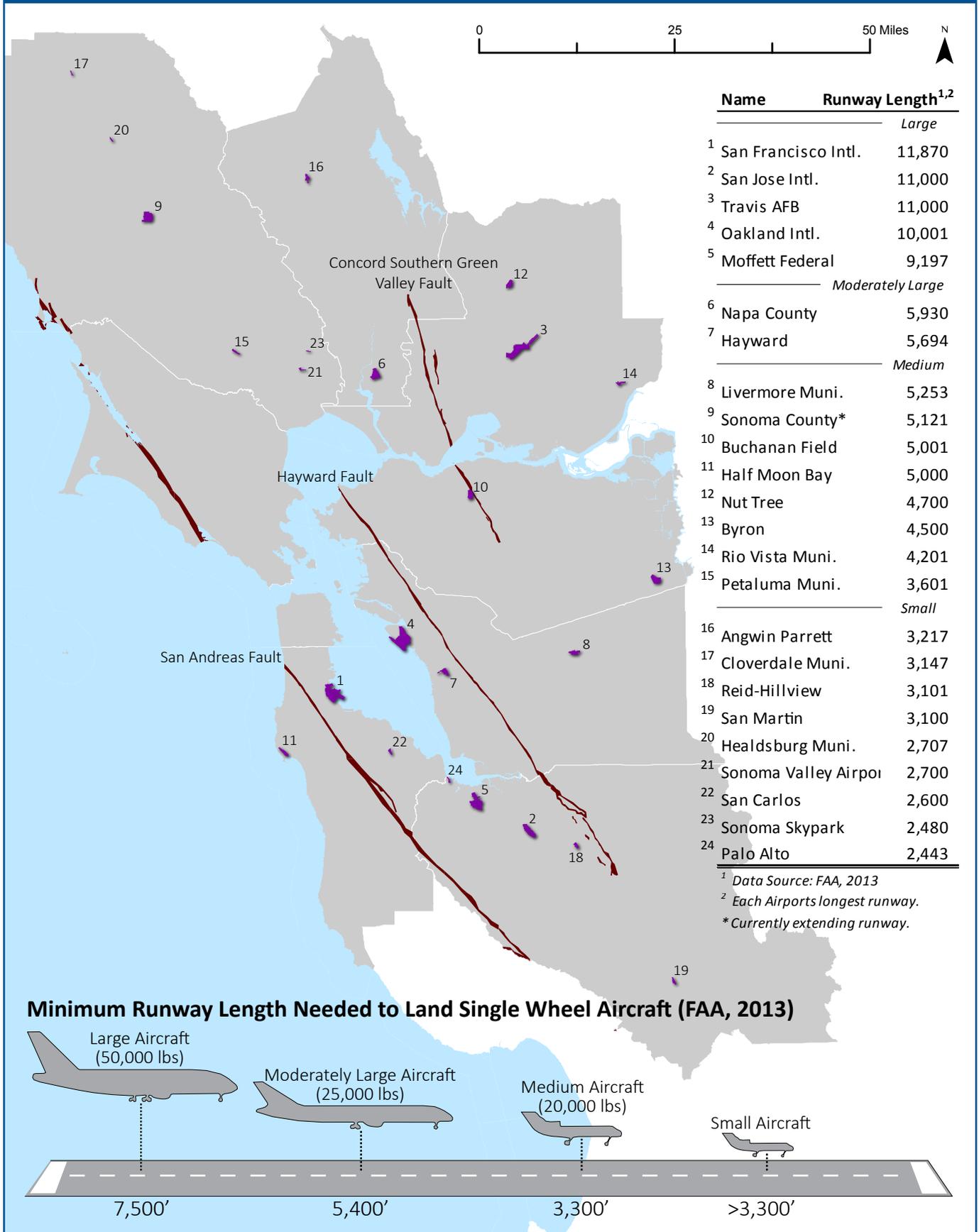
Accompanying Reports Specific to Airports.

Roles of Airports in Regional Disasters

Preliminary Assessment of Earthquake-Induced Liquefaction Susceptibility at Five San Francisco Bay Area Airports

reports are available at quake.abag.ca.gov

**FIGURE 5:
Bay Area International & General Aviation Airports**



Preliminary Assessment of Earthquake-Induced Liquefaction Susceptibility at Five San Francisco Bay Area Airports (2013) used available bore hole data to quantify the potential and degree of liquefaction to five Bay Area runways.

As the region experienced recently in the 2014 South Napa Earthquake, smaller faults in the region have the potential to cause damage to individual or a small subset of regional airports. Sidebar X highlights the fortunately minimal damage at the Napa County Airport in the South Napa Earthquake.

Because the airports in the region are well distributed throughout the region there is an ability for air traffic to be rerouted in events. San Andreas and Hayward events will test the commercial travel in the region as the three international airports are between the two faults, along with Moffett Federal. Four of the regions five airports that can handle large aircraft experience strong to violent shaking in both the San Andreas and Hayward Scenario. In the event of disruption to these four airports Travis Air Force Base in Solano County would be the only airport in the region with a long enough runway for large aircraft.

References

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SIDEBAR 2:

M6.0 South Napa Earthquake

On August 24th, 2014 an earthquake occurred on a portion of the West Napa Fault that had previously not been mapped as an active fault zone (USGS, 2014). The known section of the West Napa Fault a few miles south of the earthquake epicenter runs directly through the Napa County Airport. This section of fault did not have significant fault rupture, but rupture displacements north of the airport were greater than 1 foot (GEER, 2014).

The Napa County Airport did sustain non-structural damage to the air traffic control tower, and to shelving units elsewhere in the terminal. The airport operated without an air traffic control communications for four days until a temporary air traffic control could be set up. The tower remained unoccupied for over a month while new windows and other non-structural damage were repaired (Stockdale, 2014).

Other than a 30 minute airport closure for inspection, the airport maintained operation. The facility was without power for 12 hours and ran on backup generators during this time. PG&E used a portion of the Airport parking lot as their mobile command center, and provided additional generators to help power fixed based operator services during the short outage. Overall the earthquake was a near miss for Napa County Airport and is a reminder of the region's high earthquake risk.

Draft State and Regional Legislative Policy Agenda
LP25: Still on Shaky Ground
Building Bay Area Resilience

October 16, 2014 Public Policy Symposium

These policy recommendations have been developed building on policy guidance from the Northridge 29th Anniversary Policy Committee.

Partner agencies that framed these consensus materials include the Association of Bay Area Governments; the California Earthquake Authority; the U.S. Geological Survey; the California Geological Survey; the Structural Engineers Association of California; the Structural Engineers Association of Northern California; U.C. Berkeley's Pacific Earthquake Engineering Center; the Earthquake Engineering Research Institute; and, the California Seismic Safety Commission.

State Efforts:

Enact State-wide guidelines for the identification, evaluation and retrofit of seismically-unsafe, multi-unit "soft story" apartment buildings through state agency rule-making processes, support from the California Seismic Safety Commission and approval by the State Building Standards Commission.

Establish a State Lifelines Council under the auspices of the California Seismic Safety Commission in partnership with U.C. Berkeley's Pacific Earthquake Engineering Research Center, a consortium of academic experts from ten California universities. Tap pertinent state agencies to join the Council, including the CPUC, Department of Transportation, California Energy Commission and Department of Water Resources. Launch two pilot regions for the initial planning efforts.

Bay Area Regional Efforts:

Develop a residential seismic safety incentive program for multi-unit apartment buildings modeled on energy efficiency programs to complement existing program for single-family homes. This initiative--Property Assessed Seismic Enhancements (PASE)—will promote seismic retrofit efforts for property owners to leverage local safety, renovation and other development programs through the issue of bond monies to provide resources for community loan programs.

Convene Regional Lifelines Councils in the San Francisco Bay Area and Southern California to serve as the initial two-year pilot projects of the CSSC-sponsored State Lifelines Council. Partner with the Department of Homeland Security's Office of Infrastructure Protection, the Association of Bay Area Governments, the Metropolitan Transportation Commission, regional agencies and local governments to examine disruption risks to regional utility systems; further assess system connections; and, develop a regional strategy to foster lifeline resilience.

Adopt the International Building Code with special local amendments to improve resilience standards into new construction and retrofit (via the International Existing Building Code). ABAG, CEA, and CSSC can guide policy and technical assistance efforts. SEAONC and SEAOC will provide specialized support for local governments and communities to adopt state-of-the-practice standards to safeguard seismically at-risk areas and provide substantive, performance-based guidelines that enhance seismic resilience in new construction and retrofit programs.

LP 25

LOMA PRIETA 25 SYMPOSIUM

BUILDING BAY AREA RESILIENCE OCTOBER 16, 2014, AT OAKLAND'S KAISER CENTER

A Public Policy Symposium to Commemorate the
25th Anniversary of the Loma Prieta Earthquake and to
Support Future Resilience Action

AGENDA

8:30	Registration opens	State Senator Loni Hancock , Chair, Public Safety Committee (invited)
9:00	Welcome ABAG President Julie Pierce , City of Clayton Councilmember The Honorable Jerry Brown , California State Governor (invited) MEDIA POV on Loma Prieta 25 Video Clip and Comments from KGO News Anchor Cheryl Jennings	10:00 SHAKEOUT– Observance of Loma Prieta 1989 10:30 - 10:45 BREAK 10:45 - 11:45 RESILIENCE PROGRESS SINCE LOMA PRIETA Understanding the Telling Lessons of 1989 and the Economics of Recovery Moderator: Ezra Rapport , Executive Director, Association of Bay Area Governments Janiele Maffei , Chief Mitigation Officer, California Earthquake Authority Jack Boatwright , Ph.D, Northern California Lead Scientist, U.S. Geological Survey John Parrish , Ph.D, Chief Administrator and California State Geologist, California Geological Survey State Senator Ellen Corbett , Chair, Subcommittee Health and Human Services (invited)
9:15 - 10:30	MAYORS' PLENARY: BUILDING BAY AREA RESILIENCE From the lessons of Loma Prieta, a Resilient Future Emerges Moderator: Cheryl Jennings , KGO News Anchor Mayor Edwin Lee , City and County of San Francisco (invited) Mayor Jean Quan , City of Oakland Mayor Tom Bates , City of Berkeley CALL TO ACTION LEGISLATIVE LEADERS ON SCENE Building Bay Area Resilience with Policy Action Moderator: Dick McCarthy , Executive Director, California Seismic Safety Commission ABAG President, CalCOG President–Councilmember Julie Pierce , City of Clayton CSAC President– Supervisor John Gioia , Contra Costa County	11:45 - 12:45 LUNCH RESILIENCE STRATEGY DISCUSSION Facilitated by Steering Committee Members

more on back side

LOMA PRIETA 25 SYMPOSIUM

12:45 - 1:45

LESSONS LEARNED AND DEBRIEF FROM SOUTH NAPA EARTHQUAKE

Moderator: Miriam Chion,
ABAG Planning Director

Mayor **Jill Techel**, City of Napa

Supervisor **Erin Hannigan**, Solano County

Jeff Lusk, Director Mitigation Division,
Federal Emergency Management
Agency (FEMA) Region IX

Tina Curry, Deputy Director, California
Office of Emergency Services

ABAG Immediate Past President

Mark Luce, Supervisor Napa County

1:45 - 2:45

INFRASTRUCTURE RESILIENCE POLICY

The Interconnectedness of Utility
Systems and Social Ecosystems

Moderator: Naomi Kelly, City
Administrator, City and County of
San Francisco

Chris Poland, Consultant-
SF Lifelines Council, Applied
Technology Council Lifelines
Roadmap

Steve Mahin, Director, Pacific
Earthquake Engineering Research
(PEER)

Geisha Williams, PG&E Executive
Vice President, Electric Operations
(invited)

Supervisor **David Rabbitt**, Sonoma
County, ABAG Vice President and
Member of California Seismic Safety
Commission (CSSC)

Serge Terentieff, Engineering
Manager, East Bay Municipal Utility
District (EBMUD)

2:45 - 3:00

BREAK (COFFEE & COOKIES)



Association of
Bay Area Governments

3:00 - 4:00

BEST PRACTICES TO FINANCE RESILIENCE

Successful Financial Solutions for
Resilience Investment

Moderator: Henry Gardner, City
Administrator, City of Oakland

State Senator **Bill Monning**, Chair,
Senate Insurance Committee (invited)

Glenn Pomeroy, Executive Director,
California Earthquake Authority (CEA)

Patrick Otellini, Chief Resilience
Officer, City & County of San Francisco

West Coast Infrastructure Exchange-
TBD (invited)

4:00 - 4:40

RESILIENCE IN PRACTICE IMPLEMENTATION

Local Governments Resilience
Building Successes and Challenges

Co-moderators: Renee Domingo, City
of Oakland Emergency Services
Director and **Timothy Burroughs**, City
of Berkeley, Chief Resilience Officer

Brent Butler, Planning Manager, City
of East Palo Alto

Martin Bernal, City Manager,
Santa Cruz (invited)

Councilmember **Anu Natarajan**,
City of Fremont

4:40 - 5:00

PLENARY WRAP-UP

Ezra Rapport, ABAG Executive
Director—with concluding remarks on
Resilience Strategy discussions

Next Steps: Looking Forward to the
Coming 25 years of Resilience

Mark Ghilarducci, Director, California
Office of Emergency Services (invited)

Karen Armes, Interim Director,
Federal Emergency Management
Agency, Region IX

Closing Comments: ABAG President
Julie Pierce

5:00 - 6:00

CLOSING RECEPTION
Kaiser Center Terrace

