



Tiburon General Plan Update

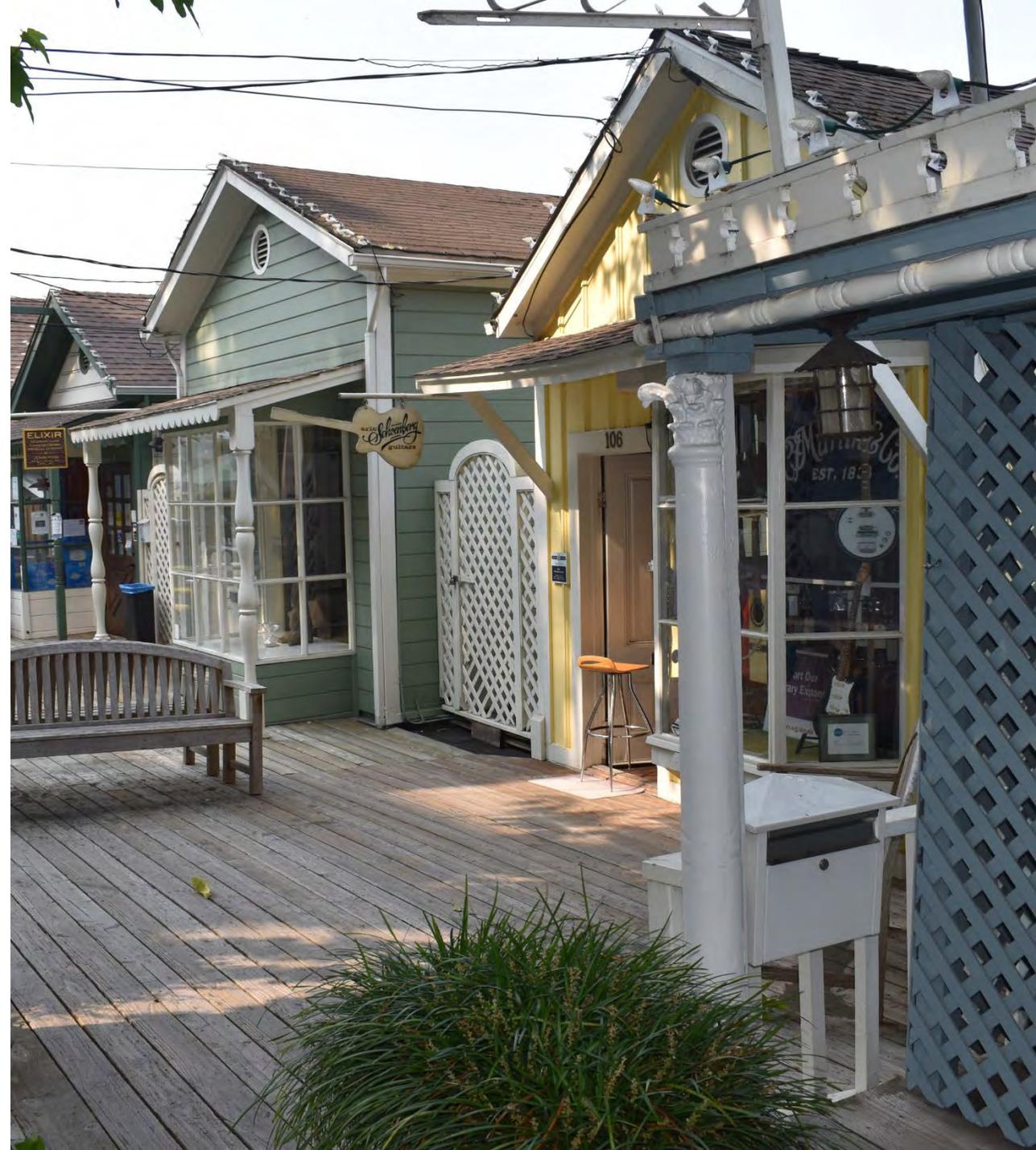
SAFETY AND RESILIENCE

Planning Commission Study Session // April 28, 2021



PROGRAM

1. General Plan Update
2. Sea Level Rise + Adaptation
 - *Key Findings*
 - *Community Engagement + Feedback*
 - *Draft Goals, Policies + Programs*
3. Safety
 - *Key Findings*
 - *Community Engagement + Feedback*
 - *Draft Goals, Policies + Programs*
4. Planning Commission Consideration + Public Comments



2. SEA LEVEL RISE + ADAPTATION

ADAPTATION PLANNING + THE TIBURON GENERAL PLAN

California requires local jurisdictions to include adaptation strategies in their **general plans**

LAND USE



Accounting for SLR vulnerability in locating development

OPEN SPACE + CONSERVATION



Multiple benefits of open space along vulnerable shorelines

SAFETY



Protecting people and property from flood hazards

CIRCULATION



Ensuring transportation links are maintained

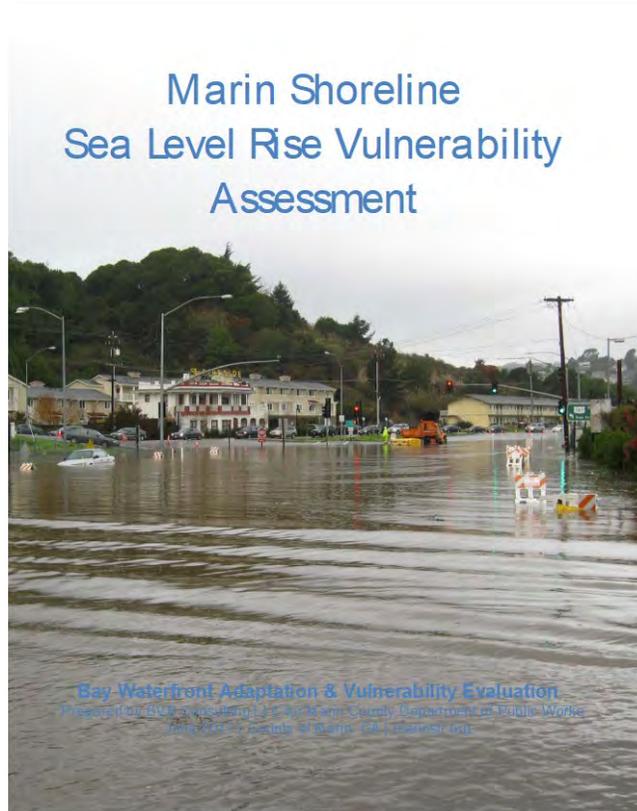
PUBLIC FACILITIES + SERVICES



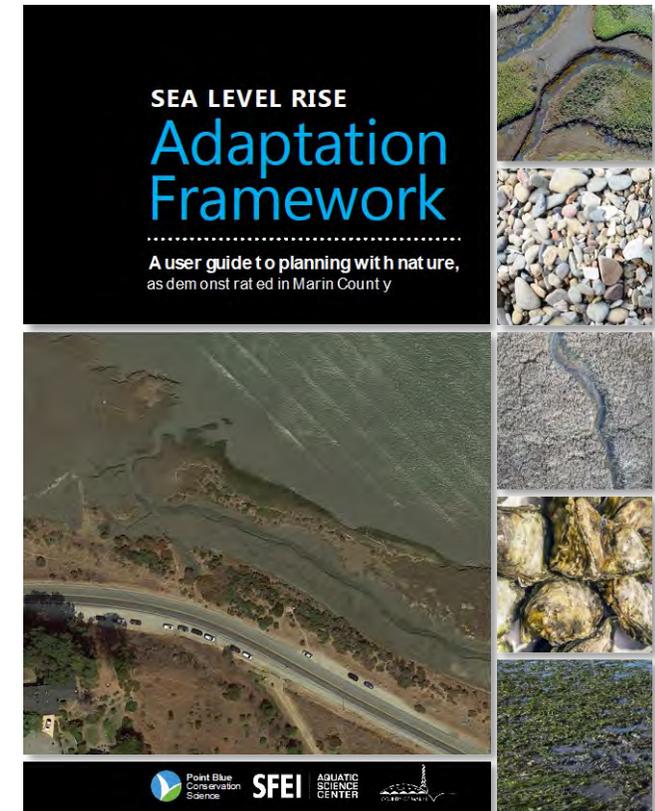
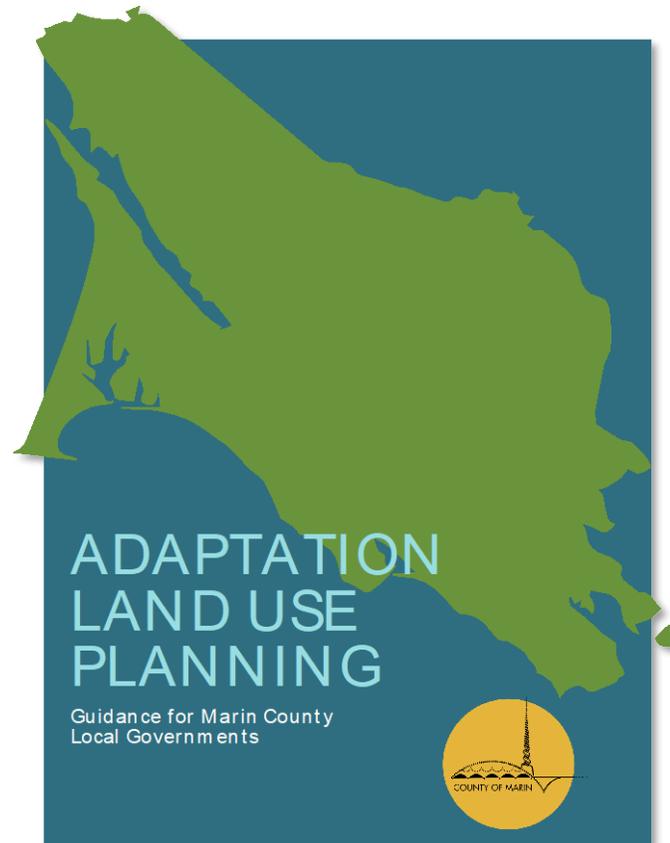
Adapting critical infrastructure

ADAPTATION PLANNING IN MARIN COUNTY

Adaptation refers to strategies that help communities and ecosystems respond to climate change



Bay Waterfront Adaptation & Vulnerability Evaluation



FLOODING TODAY

- FEMA Flood Hazard Zones are a good indicator of flood hazard areas today
- Sea level rise will likely impact the extent and base flood elevations of these zones in the future.



IMAGE CREDIT: Elliot Karlan photo / For The Ark

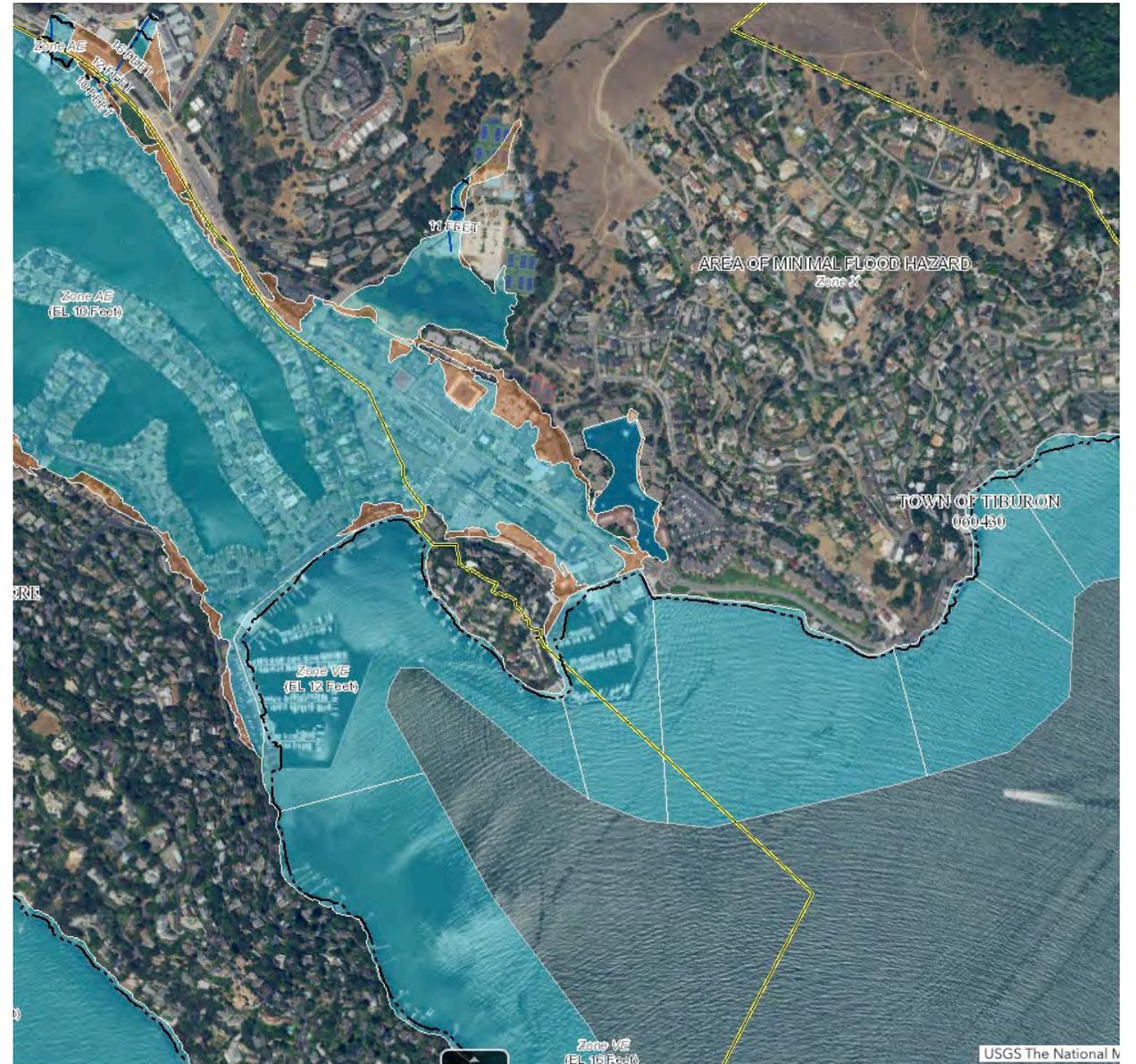
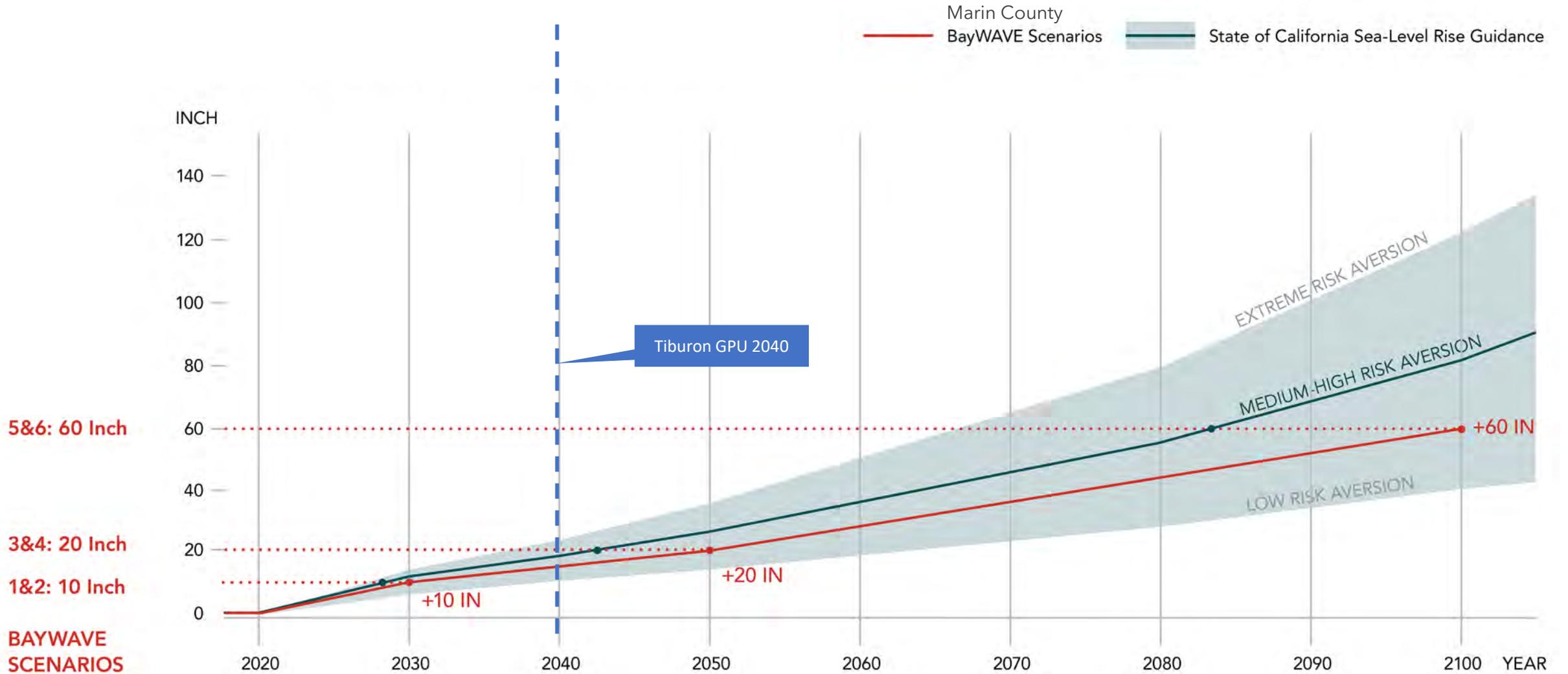


IMAGE CREDIT: FEMA Webapp (<https://hazards-fema.maps.arcgis.com/>)

SEA LEVEL RISE PROJECTIONS



SEA LEVEL RISE & OTHER FACTORS

Rising Groundwater

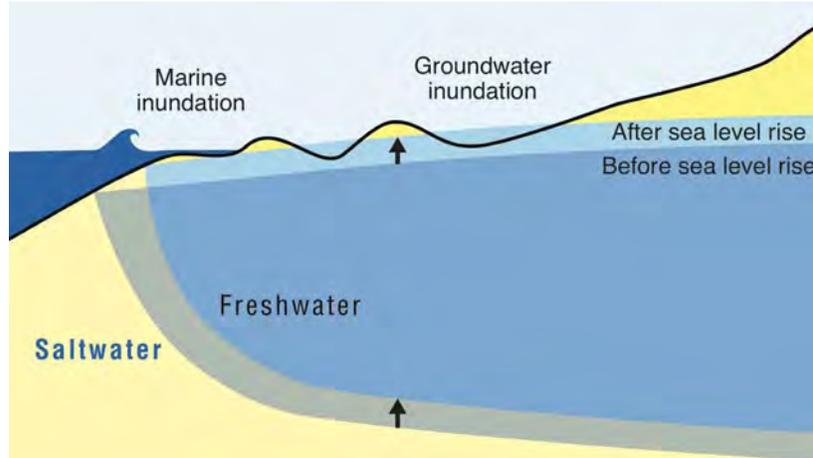


Image: UHM Coastal Geology Group

Erosion



Image: The Mercury News

Fluvial Flooding



Image: Elliot Karlan photo/For The Ark

Liquefaction



Image: USGS Publications Repository

SEA LEVEL RISE + ADAPTATION

SEA LEVEL RISE IN TIBURON

- Main Street/ Downtown
- Blackie's Pasture
- Greenwood Cove

Legend

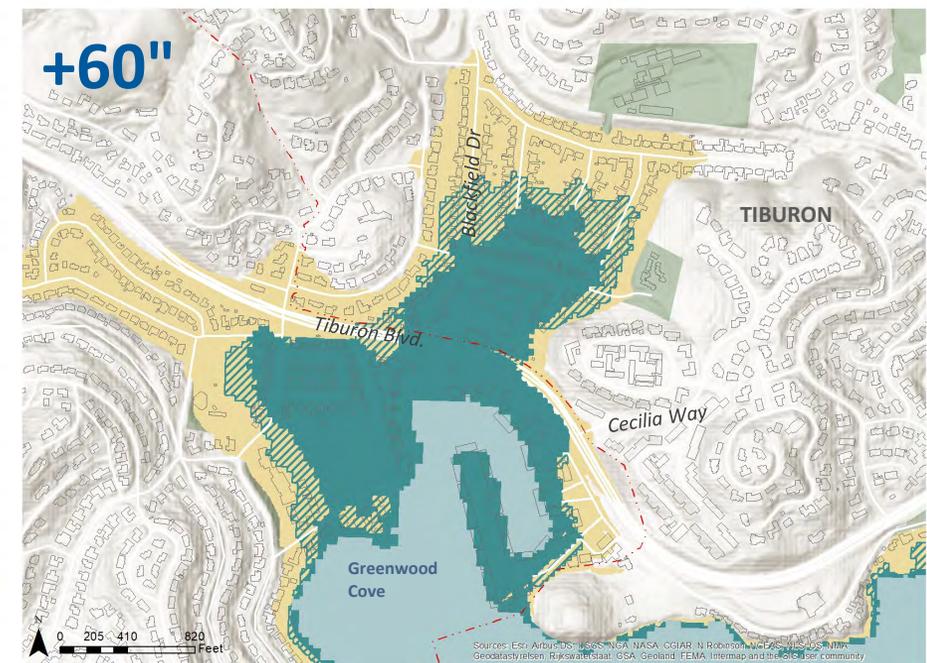
-  Shallow Groundwater
-  Existing Water Bodies
-  60 inches SLR + 100-year storm
-  City Boundary



SEA LEVEL RISE + ADAPTATION

GREENWOOD COVE AREA

SLR + Shallow Groundwater



Legend

-  Shallow groundwater
-  Existing water bodies
-  Tidal inundation
-  100-year storm inundation

SEA LEVEL RISE + ADAPTATION

DOWNTOWN

Existing Condition



SEA LEVEL RISE + ADAPTATION

DOWNTOWN

+ 10"



BayWAVE Scenario 2 (10 inches) SLR + 100 year Flood

SEA LEVEL RISE + ADAPTATION

DOWNTOWN

+ 20"



BayWAVE Scenario 4 (20 inches) SLR + 100 year Flood

SEA LEVEL RISE + ADAPTATION

DOWNTOWN

+ 60"



BayWAVE Scenario 6 (60 inches) SLR + 100 year Flood

DOWNTOWN

Vulnerable Assets



BayWAVE Scenario 6 (60 inches) SLR + 100 year Flood

SEA LEVEL RISE + ADAPTATION

MAIN STREET

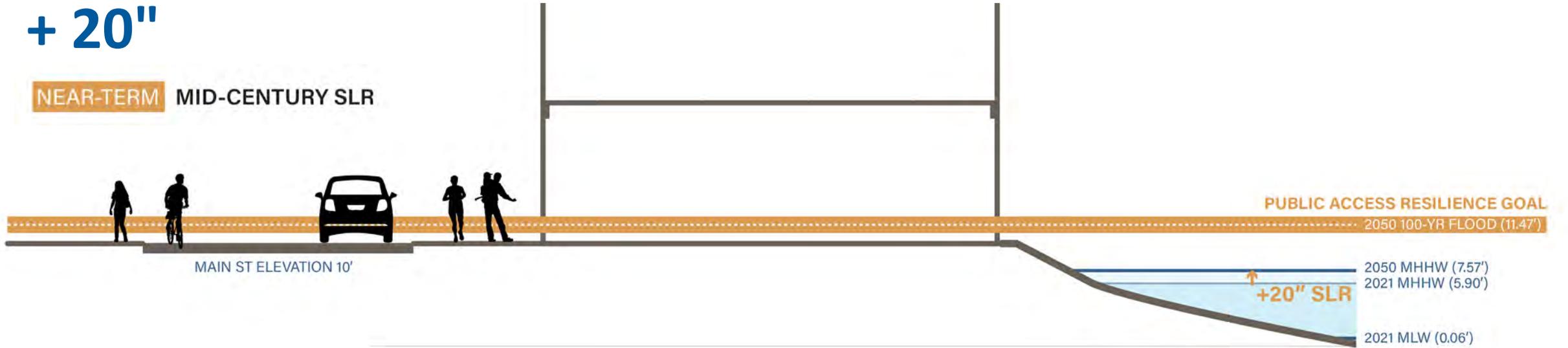


SEA LEVEL RISE + ADAPTATION

MAIN STREET

+ 20"

NEAR-TERM MID-CENTURY SLR



+ 60"

LONG-TERM END OF CENTURY SLR



KEY TAKEAWAYS

- Downtown Tiburon floods even now, and will only get worse without action.
- SLR will impact us in many different ways, from downtown vitality to housing to ecological health.
- Sea level rise models vary, but we're looking at between 10 and 25 inches by 2040 in Tiburon.
- Sea level rise also interacts with other conditions: groundwater, stormwater, liquefaction – and it is important we consider all of them when planning our adaptation strategy.

“

..cities will have to continually make decisions about where and how much to invest in the face of a great deal of uncertainty. No one knows exactly how much time Waikiki has left. Honolulu officials will have to monitor how new erosion-control measures hold up, and continue to assess how long they're likely to remain effective based on the latest science about sea level rise.

This points to an unsatisfying but important truth:

**Adaptation is a process,
not an outcome.”**

- Jainey K Bavishi
All We Can Save
Director, New York City Mayor's
Office of Resiliency

DEVELOPING A STRATEGY

1 / What is our **vision** for Tiburon? Does our adaptation strategy help achieve it?

2 / What is the right match between adaptation tools and their **environment**, keeping in mind our vision for that context in the future.

3 / What additional **benefits** could we gain, depending on the adaptation tool we choose?

4 / How long should our adaptation tool last in a given location? What should be the **duration** of our investment?



DEVELOPING A STRATEGY

5 / *Can we adapt over time, as a **sequence** of staged strategies?*

6 / *What **level of impact** can we live with? Where do we set our thresholds?*

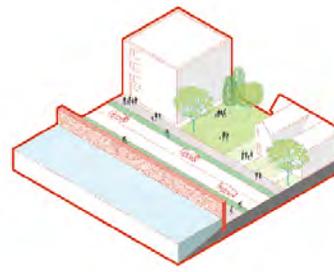
7 / *Who should be **responsible** for protecting vulnerable assets, thinking at a range of scales?*

8 / *Who can be our **partners**, to help manage the burden?*

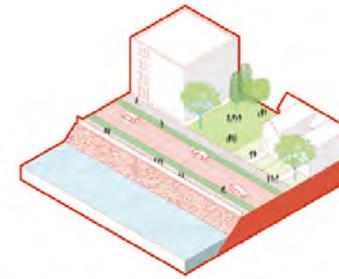


ADAPTATION TOOLS

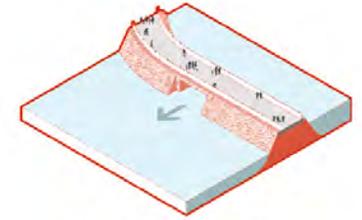
- **Shoreline hardening tools**
- **Nature-based tools**
- **Adaptation tools for our roads and infrastructure**
- **Tools to *shift development* out of harm's way over time**



Sea Wall



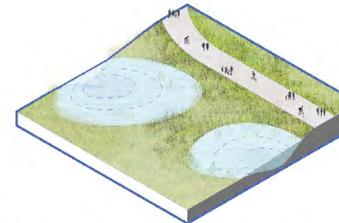
Super Levee



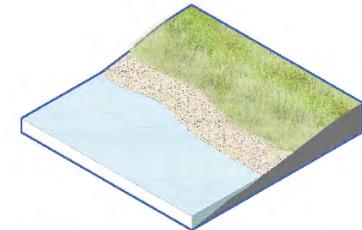
Tide Gate



Ecotone Slope



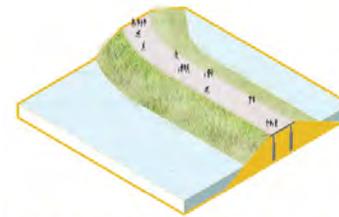
Detention Ponds



Coarse Beach



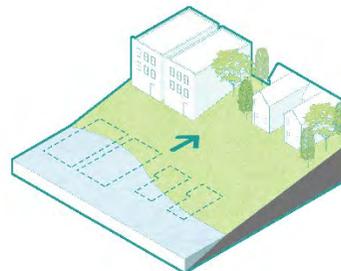
Complete Street



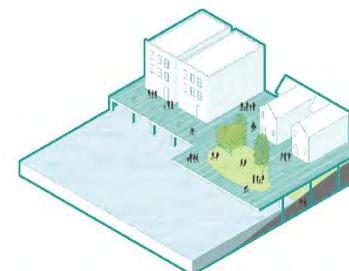
Elevated Levee



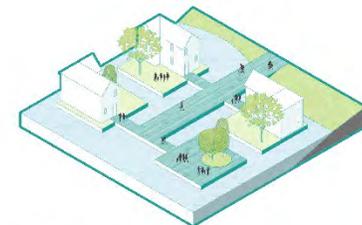
Floating Trail/
Causeway



Retreat



Elevated on Piers



Floating Houses



[Home](#)

[Workshops](#)

[Surveys](#)

[Documents](#)

[Resources](#)

[Contact](#)

A wide banner image showing a coastal town (Tiburon) with houses on a hillside, a grassy area with a yellow and white truck, and a rocky shoreline meeting the ocean under a clear blue sky.

Adapting to Sea Level Rise

[WATCH THE MARCH 2, 2021 WORKSHOP
PRESENTATION](#)

Virtual community workshop, March 2

- Presentation
- Breakout room discussions
- Reporting back
- Estimated 33 participants

Online survey

- Open March 4 – March 29, linked from [CreateTiburon2040.org](https://www.createtiburon2040.org)
- 79 responses

WORKSHOP DISCUSSIONS

GROUP 3 - Facilitator: Cristina

DOWNTOWN

1. VISION + APPROACH

What is your vision for this area in the future, recognizing its vulnerability?
What issues are most important to you? Identify three on the maps.
What should be our general approach to this area?

VISION
Territory to lose the downtown, when it becomes ailing? - flooding already an everyday
disaster that about construction with the waters - where all in this together - water flows through the river and a new beach through to
beach - not a flood or a problem - it's a coastal problem.
Things to consider:
- Riprap stabilization - priority not only for local area but also for long term term.
- Dredging - ditches of river of the bay along the edges. Historical significance of resources - natural stages, are not urban, resources
- construction to underground form, seawalls are important water access to these areas. Preserve open space - public spaces - parks
- public docks, to help lower and higher, for water to enjoy.

VULNERABLE ASSETS



APPROACH



NOTES

State of preservation or areas that are improved - if aware using public resources - solutions to make sure it's visible
public, and public resources.
Infrastructure is also a threat - flooding affects water supply water safety.

2. CO-BENEFITS

What level of investment are you willing to make here?
What additional benefits can we achieve? (big and deep)



NOTES

All investment and need to be included equally in the
planning - clear disciplinary.

3. SOLUTIONS + RESPONSIBILITIES

Who should be responsible for adapting which assets?
Are there partners we can tap for support?

APPROACH



RESPONSIBILITIES



Market - private sector cannot solve the problem...
Responsibility it cannot be put on the government either
and part of it.

PARTNERS

Type in your comments here.

NOTES

Type in your comments here.

4. TIMEFRAME + STAGES

How long should our adaptation last?
Should we think in terms of stages? If so, what level of impact
can you live with that might trigger moving to the next stage?

TIMEFRAME



STAGING



NOTES

Type in your comments here.



6 breakout rooms, each discussion one of 3 focus areas

- Downtown
- Greenwood Cove
- Blackie's Pasture

WORKSHOP FEEDBACK

Downtown

- Group 1:
 - Take a slower approach with lower upfront costs, progressive improvements over time
 - Regional approach and financing
- Group 3:
 - Protect downtown!
 - Make sure the public benefits from significant investment needed, with co-benefits of infrastructure, access to the water, recreation, preservation
 - Regional approach
- Group 5:
 - Protection shouldn't ruin what makes downtown special

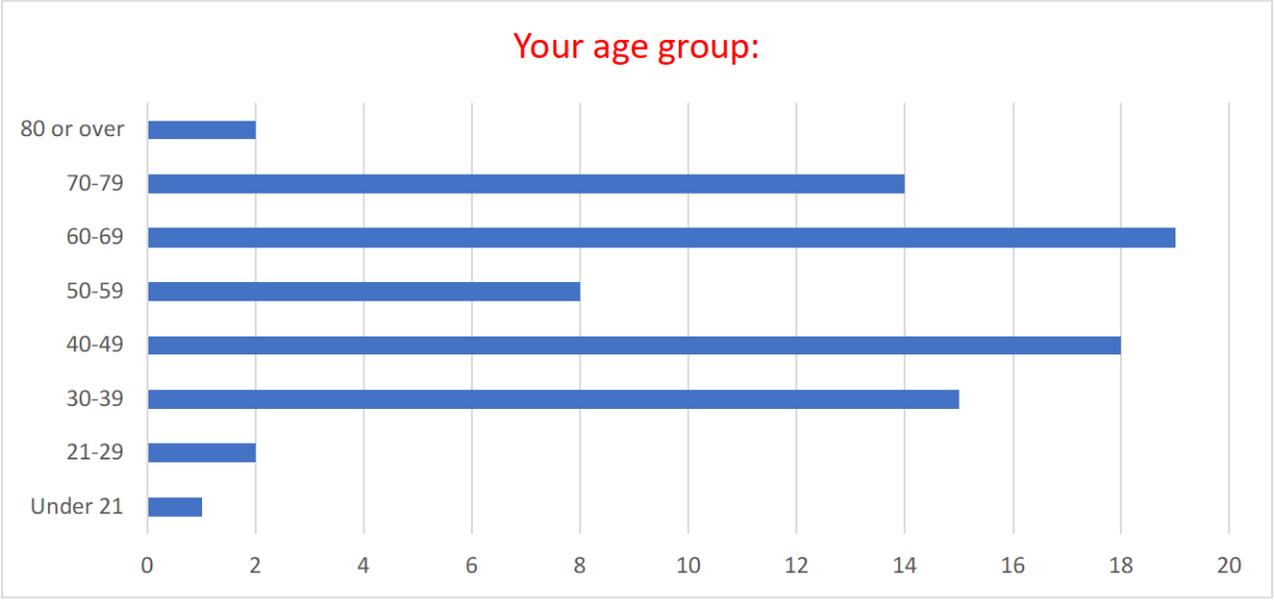
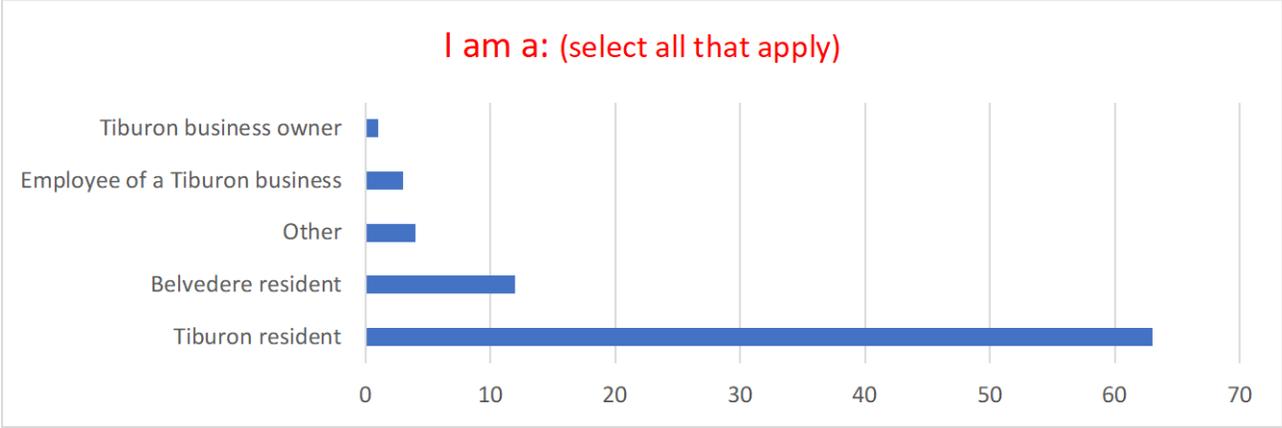
Greenwood Cove

- Group 2:
 - Raise Tiburon Blvd to protect access and use it as a levee to protect development
 - Add tide gates to storm drain
 - Explore public access connection across lagoon

Blackie's Pasture

- Group 4
 - Prioritize protecting infrastructure
 - Recreational use can adapt
 - Accommodate flooding in building code
- Group 6
 - Maintain natural character
 - Move trail back if needed
 - Protect historic trestle

SURVEY PARTICIPANTS



SUMMARY OF SURVEY RESULTS

	Downtown	Blackie's Pasture	Greenwood Cove
Priority Assets	Critical infrastructure, Main Street and its buildings and businesses are highest priorities for protection	Walking and bike paths, natural areas, Tiburon Blvd and shoreline access	Cove Shopping Center, Tiburon Blvd, and homes in the Bel Aire neighborhood
General Approach	A combination, with most emphasis on protection	A combination, with balanced emphasis on accommodation and protection, and role for retreat	A combination, with emphasis on protection
Responsibility	Shared public and private, with public leadership		
Timing	Emphasis on long-term protection, starting before flooding causes damage		

See meeting materials for more detailed survey results.

SUMMARY OF DRAFT POLICIES + PROGRAMS

Policy: Integrate flooding and SLR projections into policies, regulations and public information.

Program: Prepare and update a Flooding and Sea Level Rise Protection Map for use as a reference for Town policies, regulations and public education. (new)

Program: Coordinate data on flooding and SLR with Marin County. (new)

Program: Support creation of a countywide agency or JPA to oversee adaptation planning, financing and implementation. (new)

Program: Prepare and adopt a Sea Level Rise Adaptation Plan for portions of Town subject to tidal flooding to define adaptation options and funding sources. (new)

Policy: Increase community awareness of flooding and SLR hazards.

Program: Disclose potential property risk due to flooding and SLR in Residential Building Resale Inspections. (new)

Program: Participate in FEMA's Community Rating System to notify residents of hazards in flood-prone areas, resulting in reduced flood insurance rates. (new)

Policy: Ensure the Town's streets, public spaces and buildings, and infrastructure are resilient to flooding and SLR.

Program: Coordinate with Caltrans and utilities in protecting vulnerable infrastructure, including Tiburon Blvd., Paradise Drive and Main Street. (new)

SUMMARY OF DRAFT POLICIES + PROGRAMS

Policy: Ensure new development is resilient to flooding and SLR.

Programs: Existing GP programs address using the development review process to study and mitigate potential development impacts and risk. (existing programs)

Program: Consider increasing minimum finished floor elevation of new development from +2 feet to +3 feet above FEMA 100-year flood elevation to protect structures against future SLR. (new)

Policy: Ensure new development mitigates storm drainage impacts.

Program: Encourage use of green infrastructure in storm water improvements. (new)

DISCUSSION

3. SAFETY

HAZARDS

Earthquake



Landslide



Wildfire

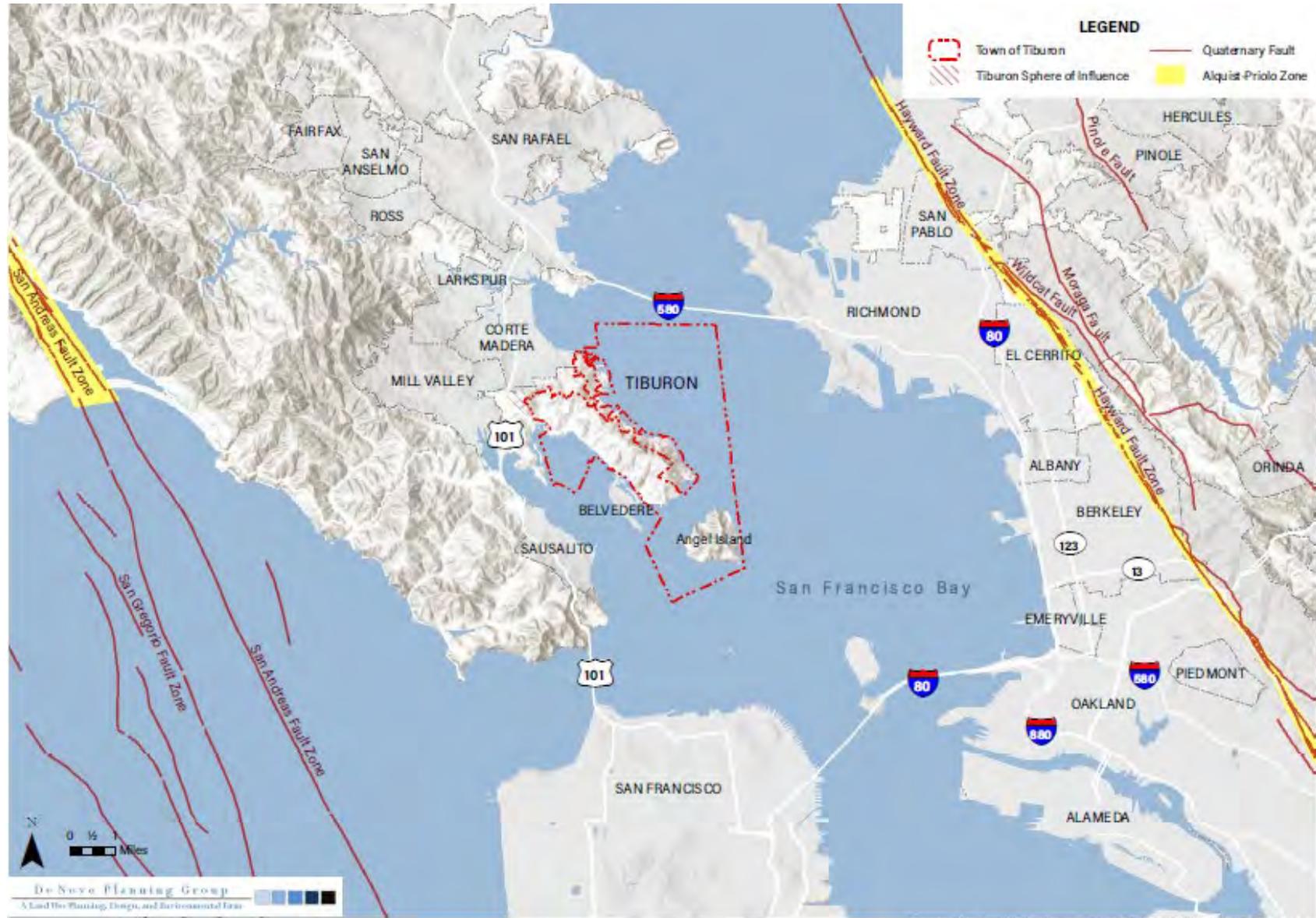


**Hazardous
Materials**



EARTHQUAKE

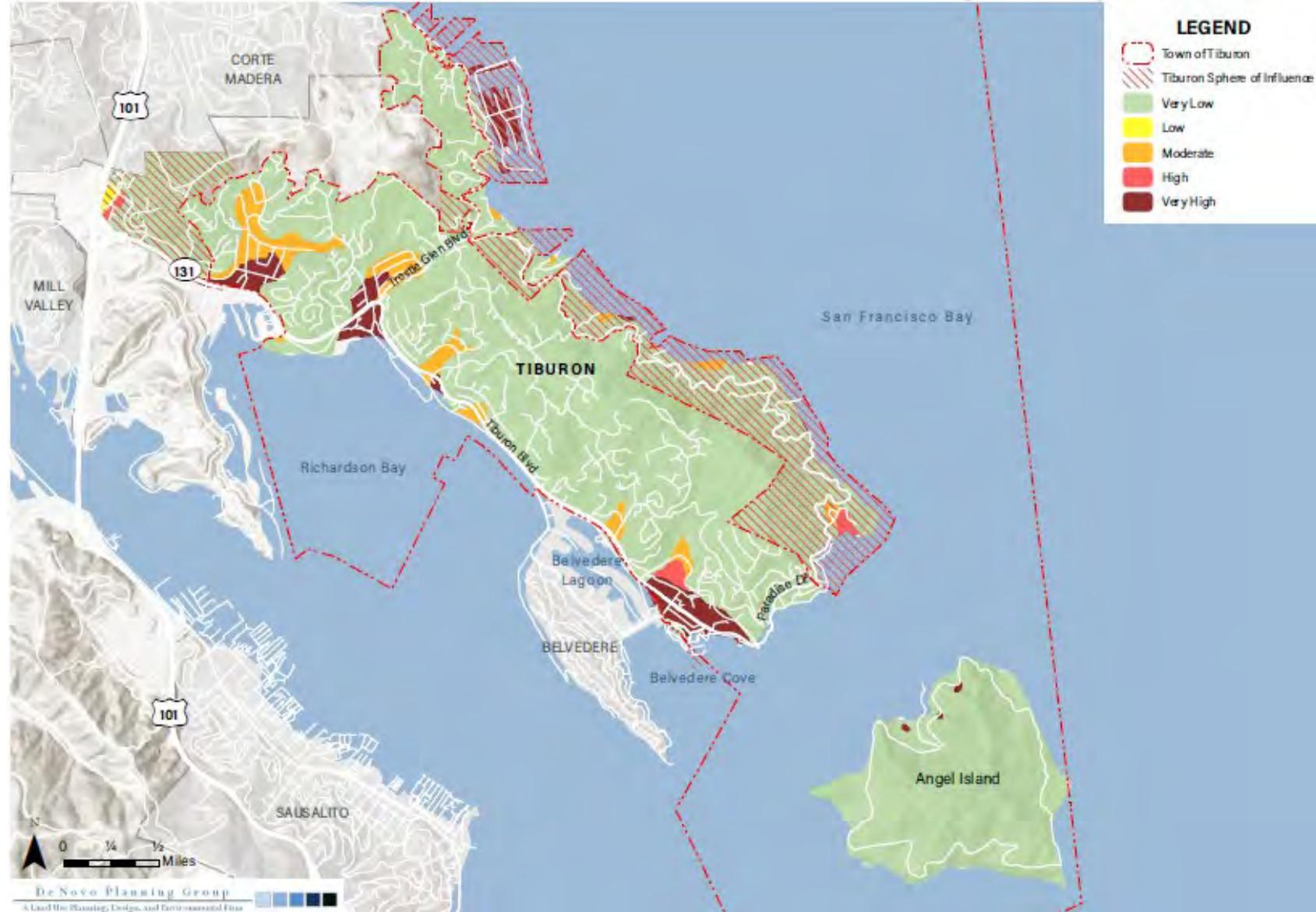
- San Andreas fault located 9 miles to the west
- Hayward fault located 7 miles to the east
- Recent earthquakes in the area
 - 6.0 South Napa (2014)
 - 4.1 Yountville (2015)
- 72% chance for a 6.7+ earthquake in SF Bay region within 30-year period (2014-2043)



LIQUEFACTION VULNERABILITY

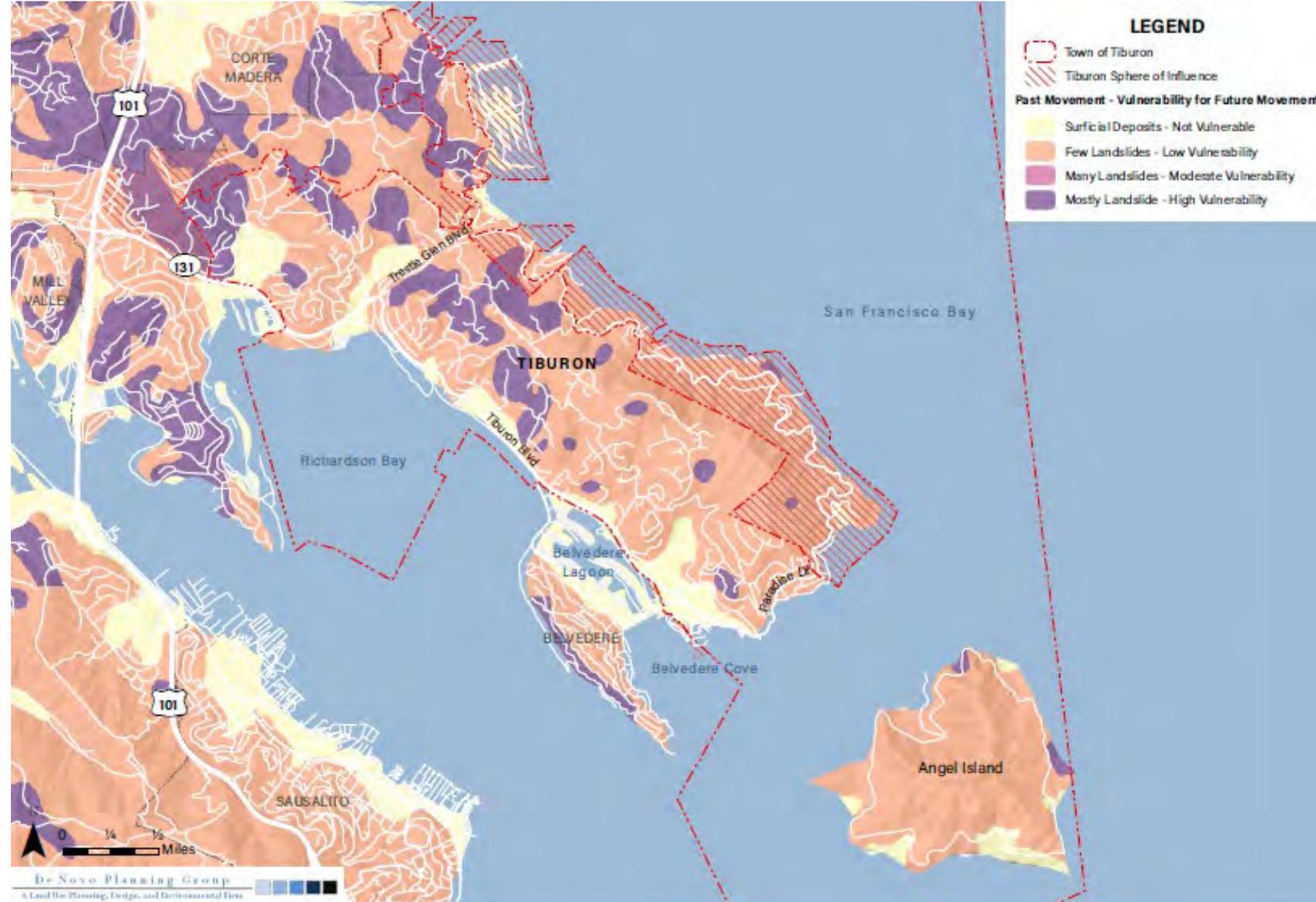
Liquefaction potential highest in areas built on bay mud and with high water table

- Downtown to the Library
- Blackie's Pasture
- Jefferson Drive and Mercury Avenue neighborhoods
- Cove Shopping Center and Bel Aire neighborhood



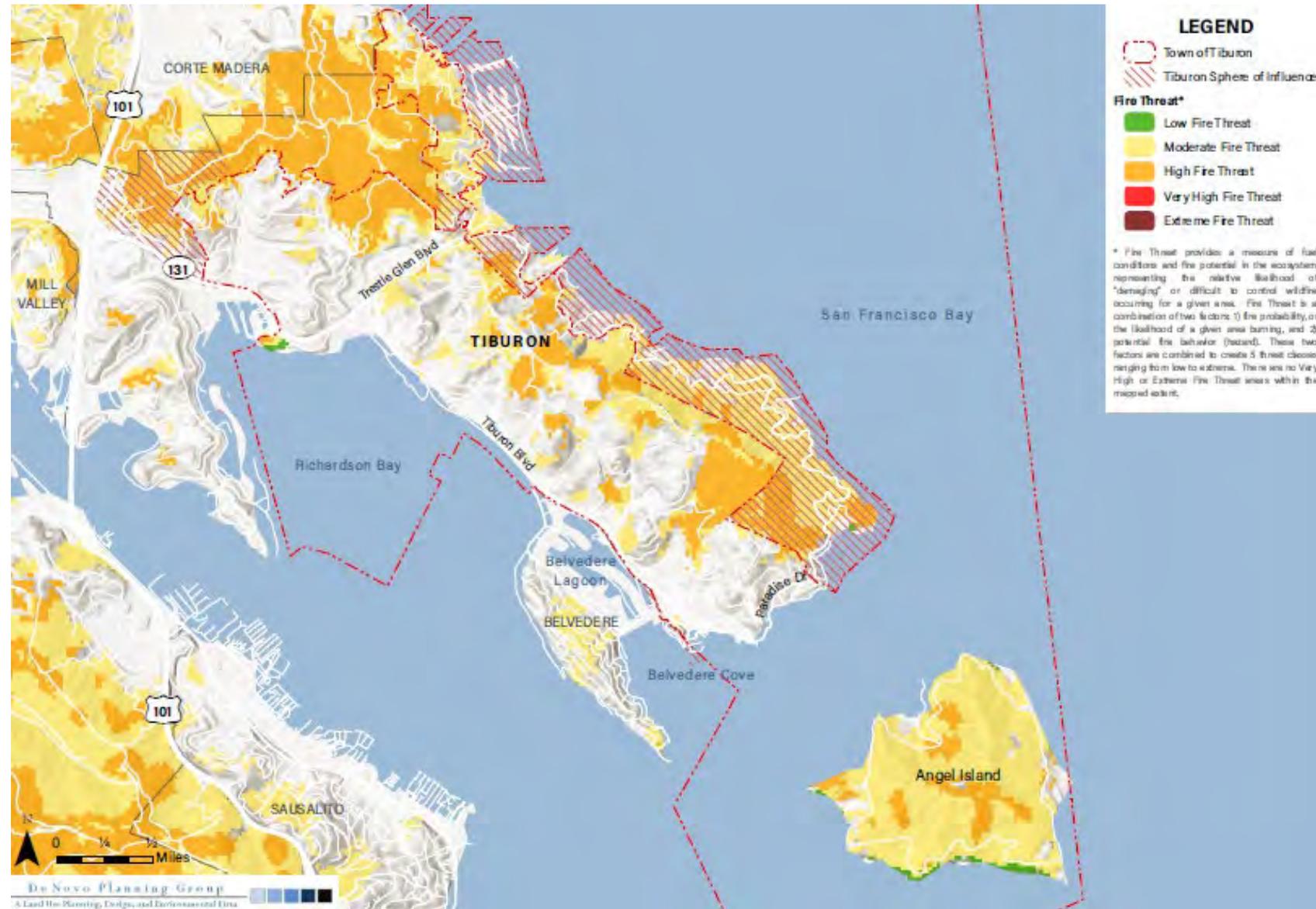
LANDSLIDE VULNERABILITY

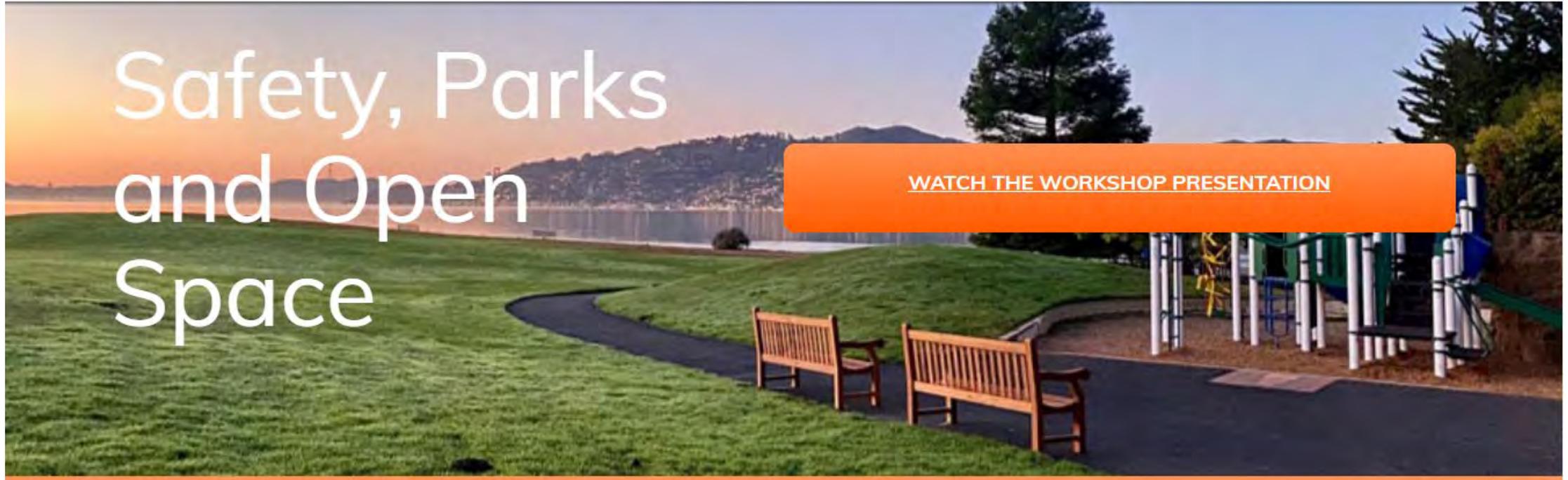
- Landslide potential is highest in the steep hillside areas.
- Common causes of landslides include heavy rainfall events and construction activity associated with road building.



WILDFIRE

- Fire threat areas identified using fuel ranking system considering vegetation and slope.
- Threat ranked from Low to Extreme.
- About half of Tiburon is moderate and high risk.
- High fire threat is in areas with more combustible vegetation and greater slopes.





Safety, Parks and Open Space

[WATCH THE WORKSHOP PRESENTATION](#)

Virtual community workshop, March 30

- Presentation and polling
- Breakout room discussions
- Reporting back
- Estimated 24 participants

Online survey

- Open March 31 – April 26, linked from CreateTiburon2040.org
- 123 responses

WORKSHOP DISCUSSIONS

Group 3 - Facilitator: Cristina

SAFETY

1 How can the Town better prepare for emergencies?

More public training - Get Ready classes - available on youtube as well.
- Search "Tiburon Police Get Ready"

How to get people to sign up for classes - What is in the class?
- how to prep for emergencies - including how to prep your home.
- PSPS

Evacuation Routes
- Hot topic in the town - "Zone Haven" will provide evacuation routes based on a particular event

- AlertMarin.org emergency notifications

Written material or website?
- TownofTiburon.org Disaster Preparedness page - "Get Ready" manual/booklet
- Police Dept has copies of the manual
- Classes available on Zoom and at the station

Are there more step lanes or paths? - routes out without needing a car.
- evacuation markers available if you are on foot

Communication Issue - power outage event - Nextdoor can be very valuable - sharing info about supplies, and power outlets, asking for help - Internet /cell coverage was in tact during the outage.

Could the town have a presence on Nextdoor to advertise classes, etc?

Access to refrigeration, assisted charger needs to assist residents

Officer on patrol to monitor bike speeds on the old rail trail - patrol is funded.

2 How can the Town further reduce fire risks?

Neighbors helping neighbors
Block captain programs are popular in belvedere - could also happen in Tiburon as well. One person assigned to a number of homes 8-10 .

How to cross the communities across age groups

Hill communities are hard to socially connect.

Could there be a walk your neighborhood event to meet neighbors and learn about evacuation routes as a group?
Find the hotdog cart at the end of the path - use incentives, etc.

Path maps and signage for the trails - discreet signage (e.g. mill valley has new decals with evacuation trail routes) Approved by disaster council.
Slowed by pandemic

Coordinate with school district to learn about evacuation routes - driven by kids in each home. - Could be part of the GRS program - to get 5th graders involved.

Delmar gym - first aid station and shelter (with red cross assistance) Field hospital is up to date - most things don't expire - well stocked and expanded over the years - team of volunteers or medical staff on call - with generator backup

Helicopter landing areas at delmar, or blackies pasture, other areas as well.

Sausalito Market - got a generator - helped their local community - Driver Market - generated a lot of good will. Could there be public private partnership? - Could there be a loaner generator from the Town to support mission critical businesses locally?

THird Tuesday every month - Disaster Advisory Council open meetings

3 breakout rooms dedicated to safety with subject matter experts:

- Mike Lantier, Deputy Fire Marshal, Tiburon Fire Protection District
- Fred Hilliard, Division Chief/Fire Marshal, Southern Marin Fire District
- Laurie Nilsen, Tiburon Office of Emergency Services

WORKSHOP FEEDBACK

How can the Town reduce wildfire risk?

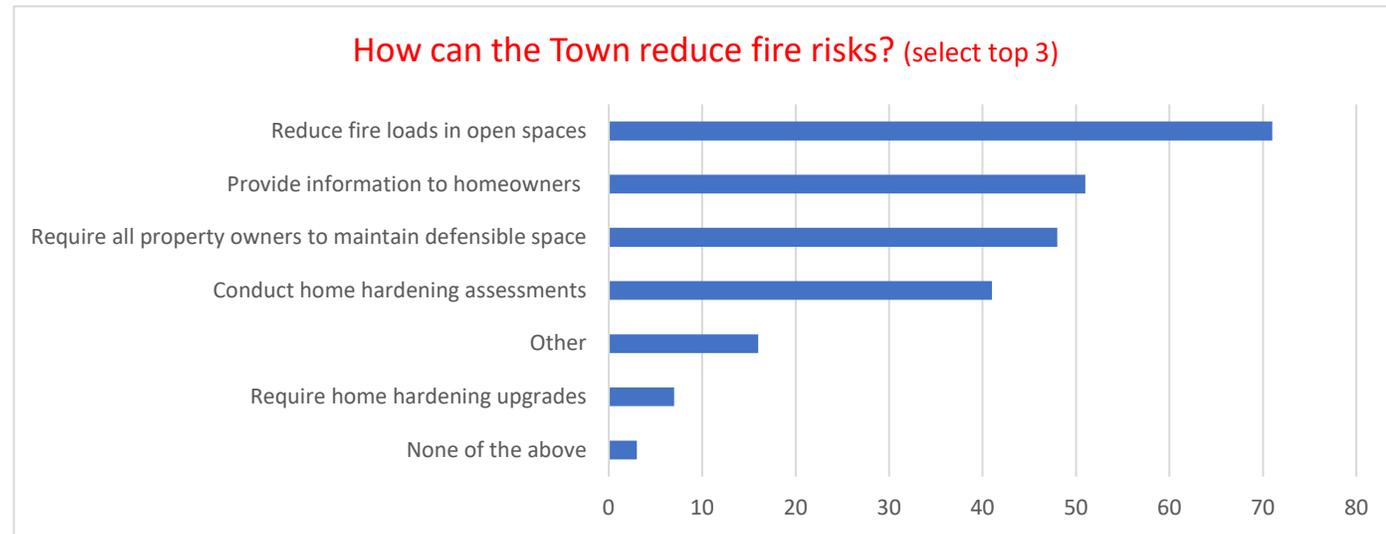
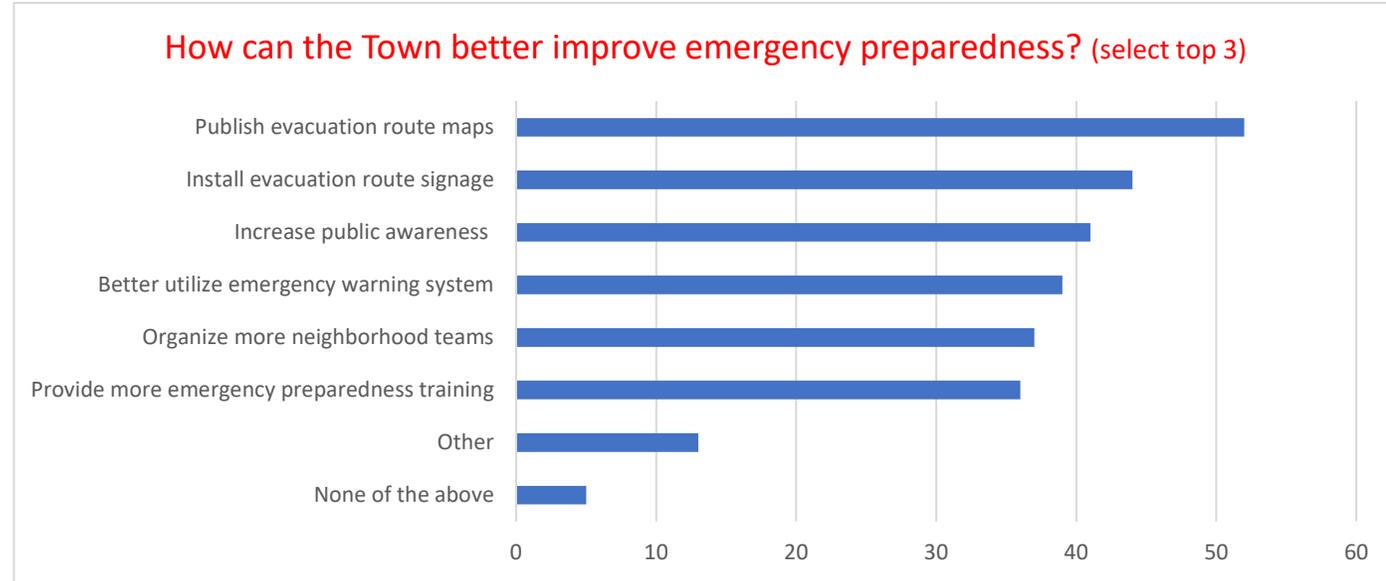
- Organize neighborhoods with block captains
- Require defensible space for all existing development
- Assess flammability of vegetation
 - Provide information to residents; utilize Tiburon Talk, mailers, neighborhood associations
- Reduce fire loads
 - Expand chipper program and increase drop off locations
 - Remove brush from open space

How can the Town better prepare for emergencies?

- Provide more public training
 - Get Ready classes on YouTube, Zoom
 - Add materials to website
 - Utilize social media
- Provide more emergency notification
 - AlertMarin.org, NextDoor
- Publish evacuation route maps
 - Zonehaven
- Identify evacuation routes
 - Decals and signage
 - Evacuation drills
- Provide access to refrigeration and charging during emergencies and PSPS events

SURVEY RESULTS

123 Responses



SUMMARY OF DRAFT POLICIES + PROGRAMS: SEISMIC AND LAND FAILURE RISKS

Policies:

- Permit development only in areas where risk can be avoided or adequately mitigated.
- Discourage development of slopes exceeding 40% where possible.

Programs:

- Require detailed geotechnical investigations for development proposals.
- Prepare a Seismic Improvement Program for public buildings and infrastructure.
- Advise residents on ways they can reduce geologic hazards.

SUMMARY OF DRAFT POLICIES + PROGRAMS: FIRE PREVENTION

Policies:

- Reduce fire risk through code enforcement and coordination with fire agencies (Marin County and Southern Marin Fire Protection District).
- Work with fire agencies to maintain emergency access routes.

Programs:

- Refer new development proposals to appropriate fire agency to review and recommend mitigation measures for home hardening and vegetation management.
- Consider adopting an ordinance requiring maintenance of defensible space on properties where fire hazard is significant. (new)
- Implement the adopted Open Space Management Plan (2010) to reduce fuel loads and maintain fire roads and evacuation routes. (new)

SUMMARY OF DRAFT POLICIES + PROGRAMS: **EMERGENCY PREPAREDNESS**

Policies:

- Prepare for emergency response and to continue essential public services after disasters.
- Encourage neighborhood education and organization for disaster preparedness and recovery. (new)

Programs:

- Update and provide training on the Town's Emergency Operations Plan.
- Implement the adopted Local Hazard Mitigation Plan.
- Support educational and training programs of the fire agencies and help engage Neighborhood Watch Groups or similar organizations in disaster preparedness. (new)
- Provide signage for evacuation routes and promote emergency route ID phone applications. (new)
- Promote public safety emergency notification systems. (new)

DISCUSSION

NEXT STEPS

- Parks, Open Space and Trails Commission meeting in May to review community input, receive policy direction
- Planning Commission meeting on June 9th to review community input, receive policy direction on Parks and Open Space policies
- Planning Commission meeting on June 23rd to review community input, receive policy direction on Downtown policies
- Town Council meeting in August to discuss policy alternatives
- Draft General Plan in March 2022

General Plan Update

- Community workshop on Housing in June
- Check the website for workshop registration, new surveys, draft documents





Tiburon General Plan Update

SAFETY AND RESILIENCE

April 2021

