



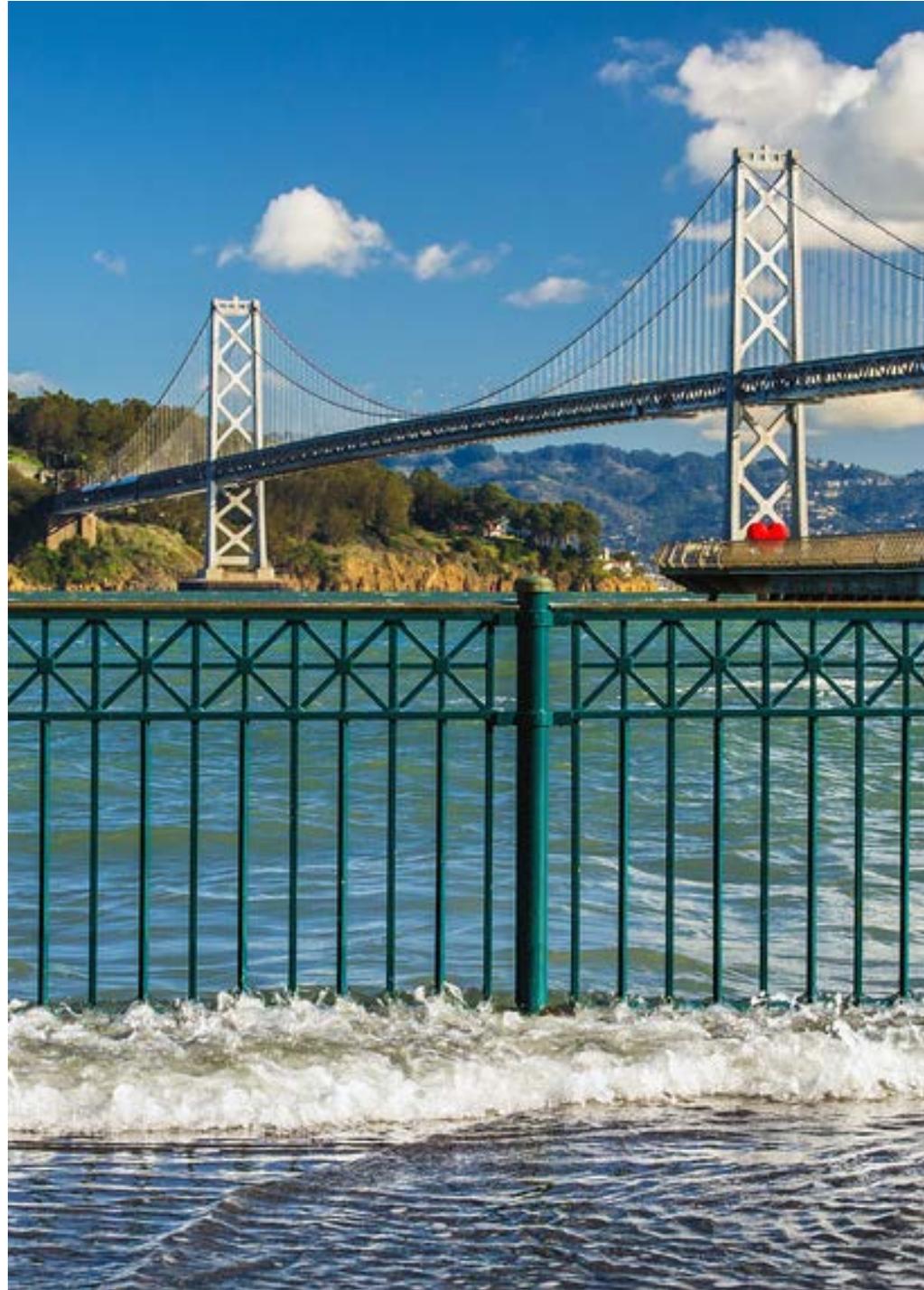
# Sea Level Rise Adaptation for Sustainable Communities

National Adaptation Forum | April 2, 2013

# Who Are We

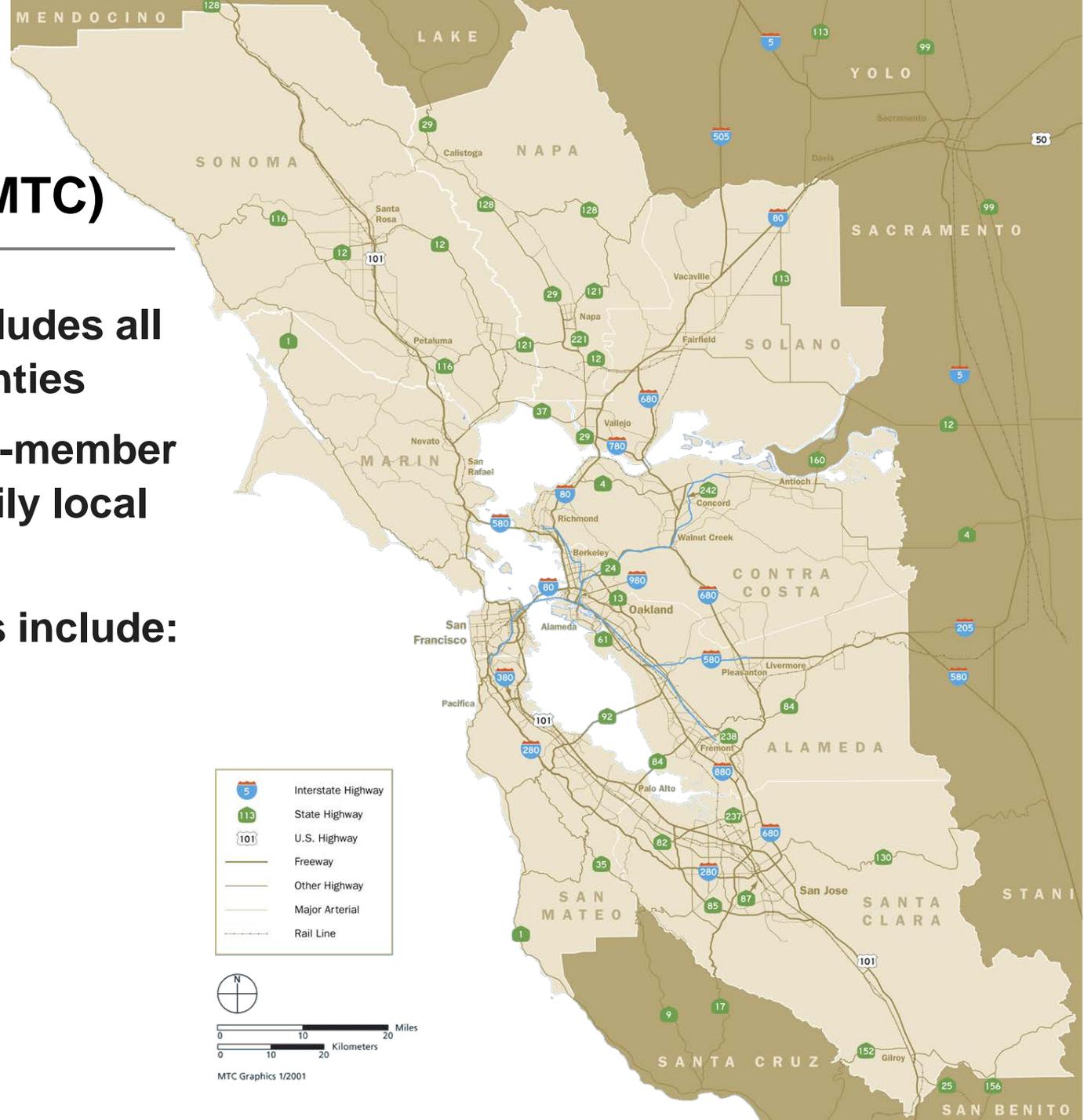
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- **Brenda Dix**, Climate Initiative Program Coordinator | *Metropolitan Transportation Commission (MTC)*
- **Kris May**, Senior Coastal Engineer and Scientist | *AECOM*
- **Sarah Head**, Senior Sustainable Economist | *AECOM*



# Metropolitan Transportation Commission (MTC)

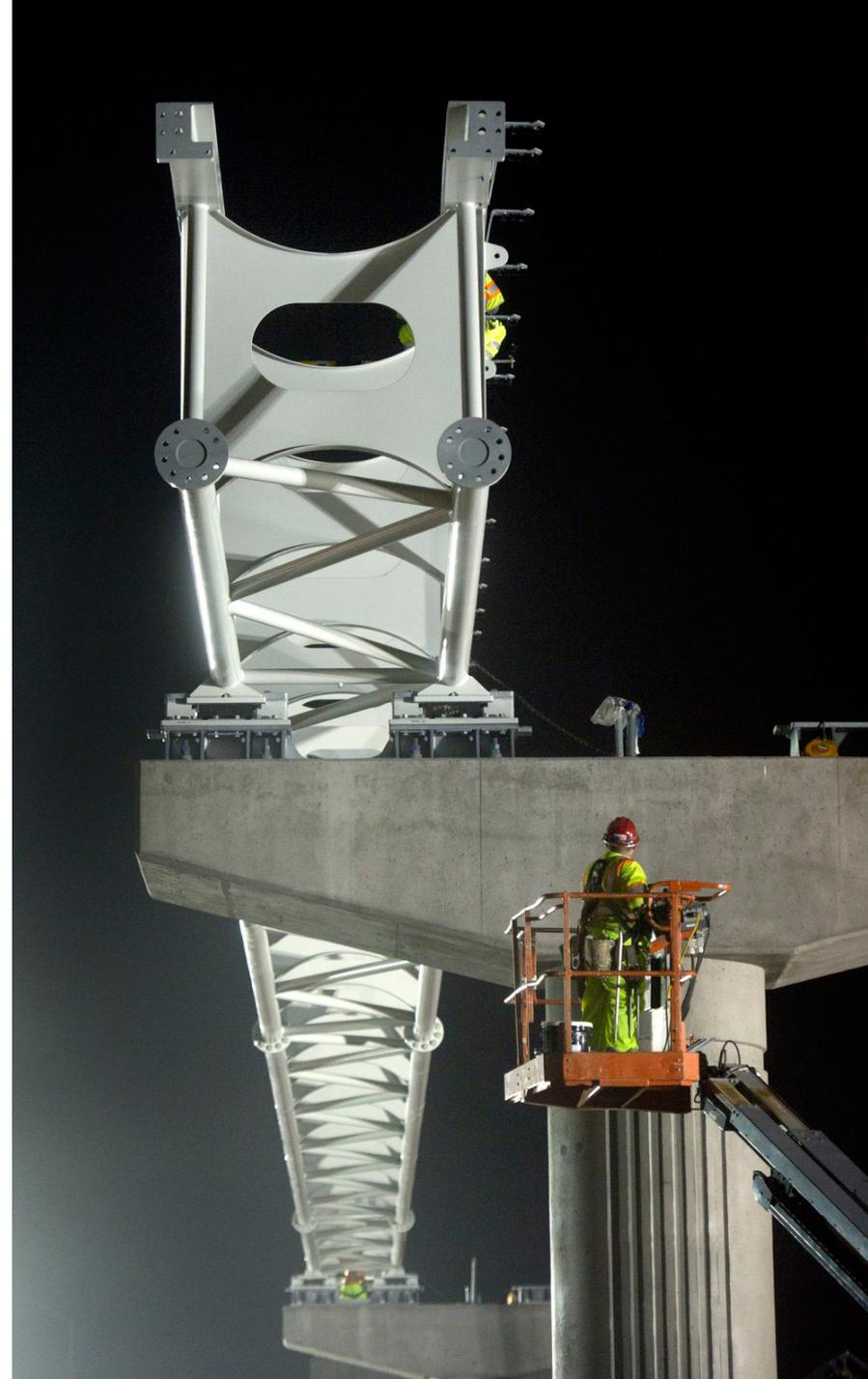
- Jurisdiction includes all 9 Bay Area counties
- Governed by 19-member board of primarily local elected officials
- Responsibilities include:
  - Planning
  - Funding
  - Coordination
  - Operations
  - Advocacy



# Regional Transportation Plan

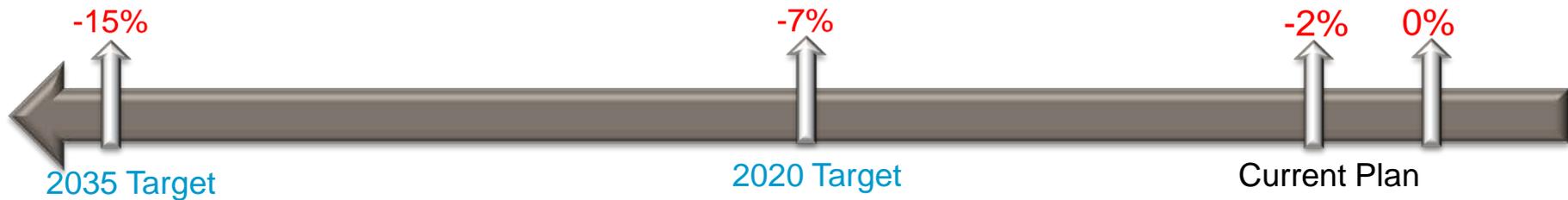
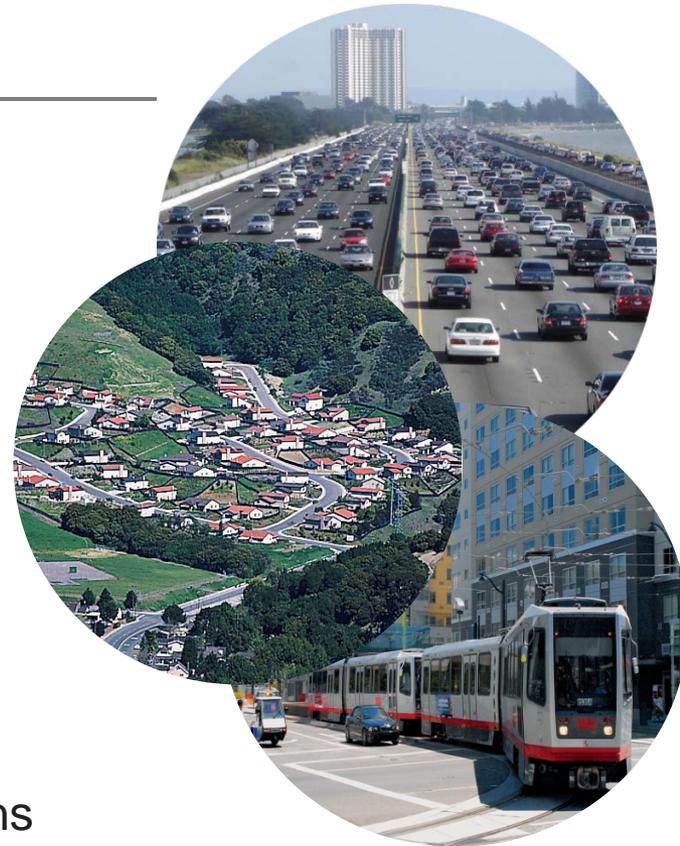
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- Road map that guides region's transportation development over 25-year period
- Plan constrained to revenues reasonably available to region
- Updated every four years
- Extensive public outreach and consultation with various agencies
- Transportation projects must be consistent with RTP to receive federal, state or regional funding



# Climate Change Legislation

- **Assembly Bill 32: Global Warming Solutions Act**
  - Sets the state **GHG emissions limit in 2020 at 1990 levels** and points the way towards 80% reduction by 2050
- **Senate Bill 375: Sustainable Communities Strategy**
  - Requires the **integration of land use and transportation planning in a Sustainable Communities Strategy (SCS)** to reduce emissions from light duty vehicles



Per Capita Light Duty Vehicle Emission Reduction Targets

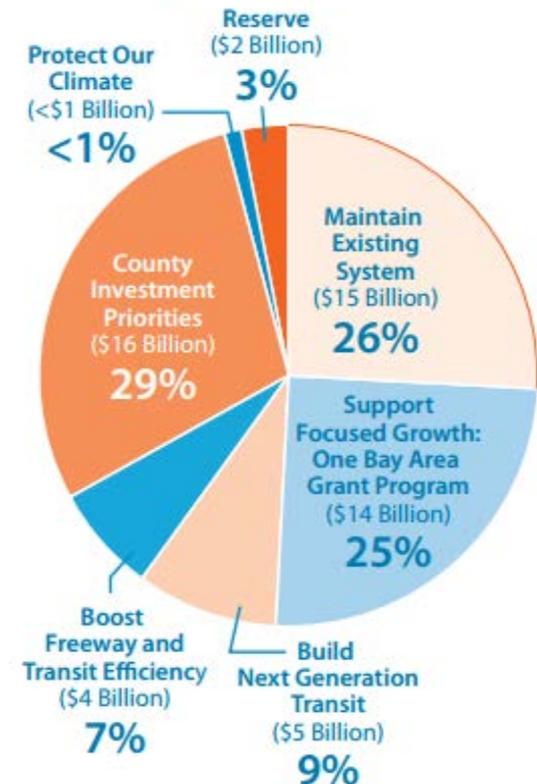
# Plan Bay Area Basics



Between now and 2040 the Bay Area will:

- Add over 2.1 million people in 660,000 housing units
- Attract 1.1 million new jobs
- Focus growth in existing cities that are well served by transit
- Construct over 700 transportation projects for a total of \$289 billion
- Balance many goals including:
  - Protecting the Climate
  - Providing Adequate Housing
  - Creating Healthy and Safe Communities
  - Preserving Open Space
  - Supporting the Economy
  - Creating Equitable Access
  - Improving Transportation System Effectiveness

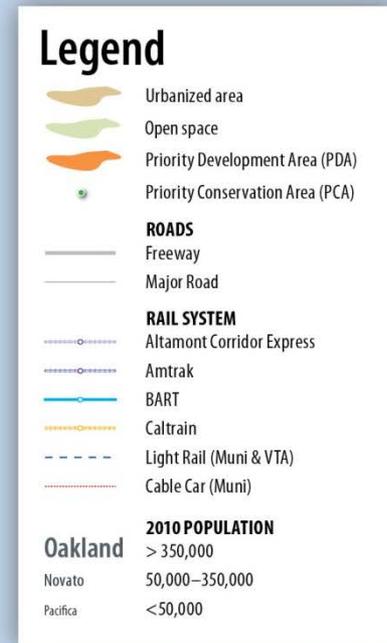
**Figure 2 Plan Bay Area — Discretionary Investment Summary**  
(in year-of-expenditure \$)



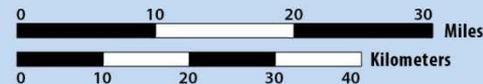
# Plan Bay Area Growth

- Growth focused in Priority Development Areas that were nominated by local cities and counties
- Transportation projects nominated by local cities and counties to serve their residents needs

## San Francisco Bay Area: Transportation and Land Uses



San Francisco Bay Area - Transportation and Land Uses | 3.20.13



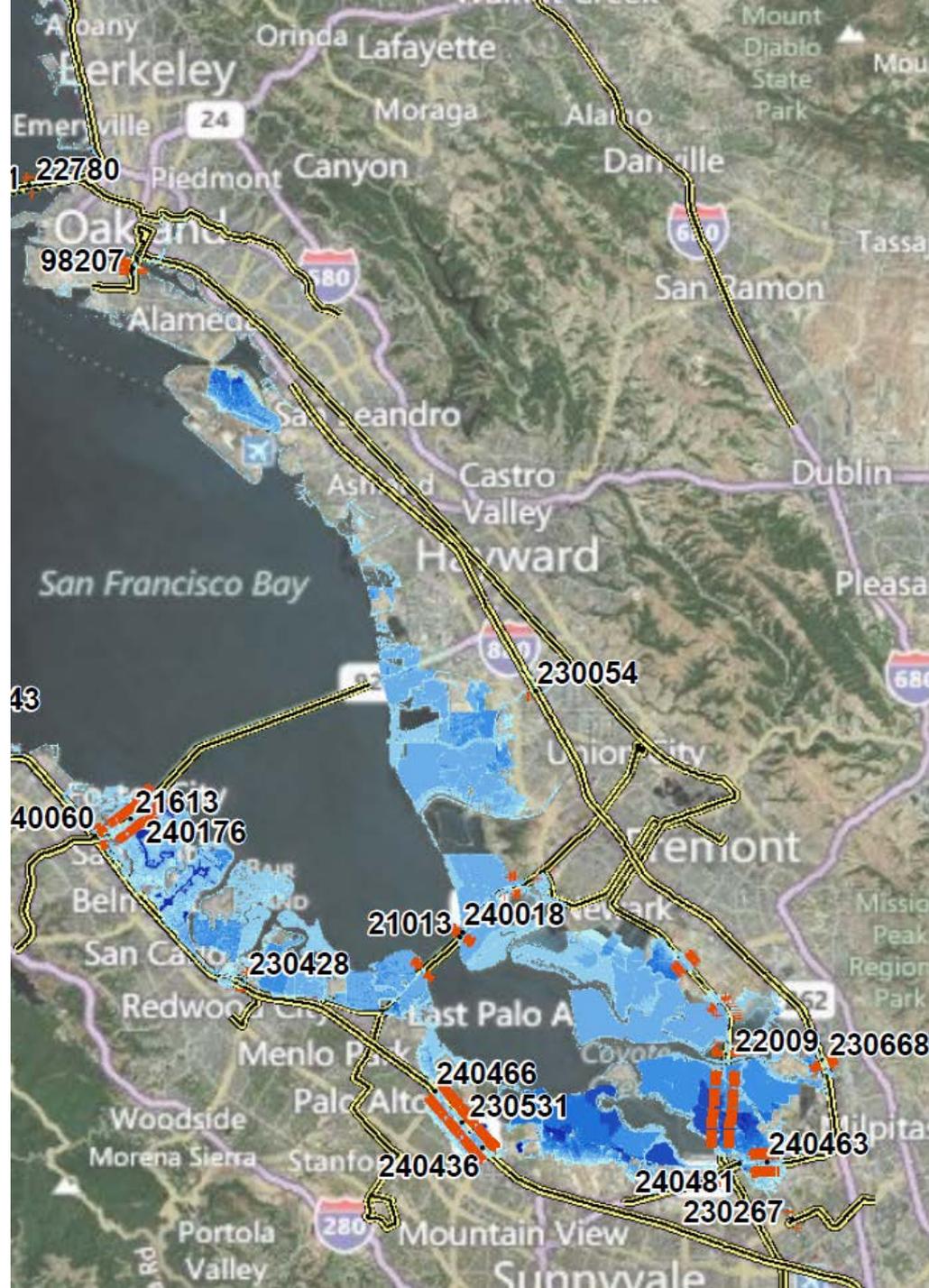
# Impact Analysis

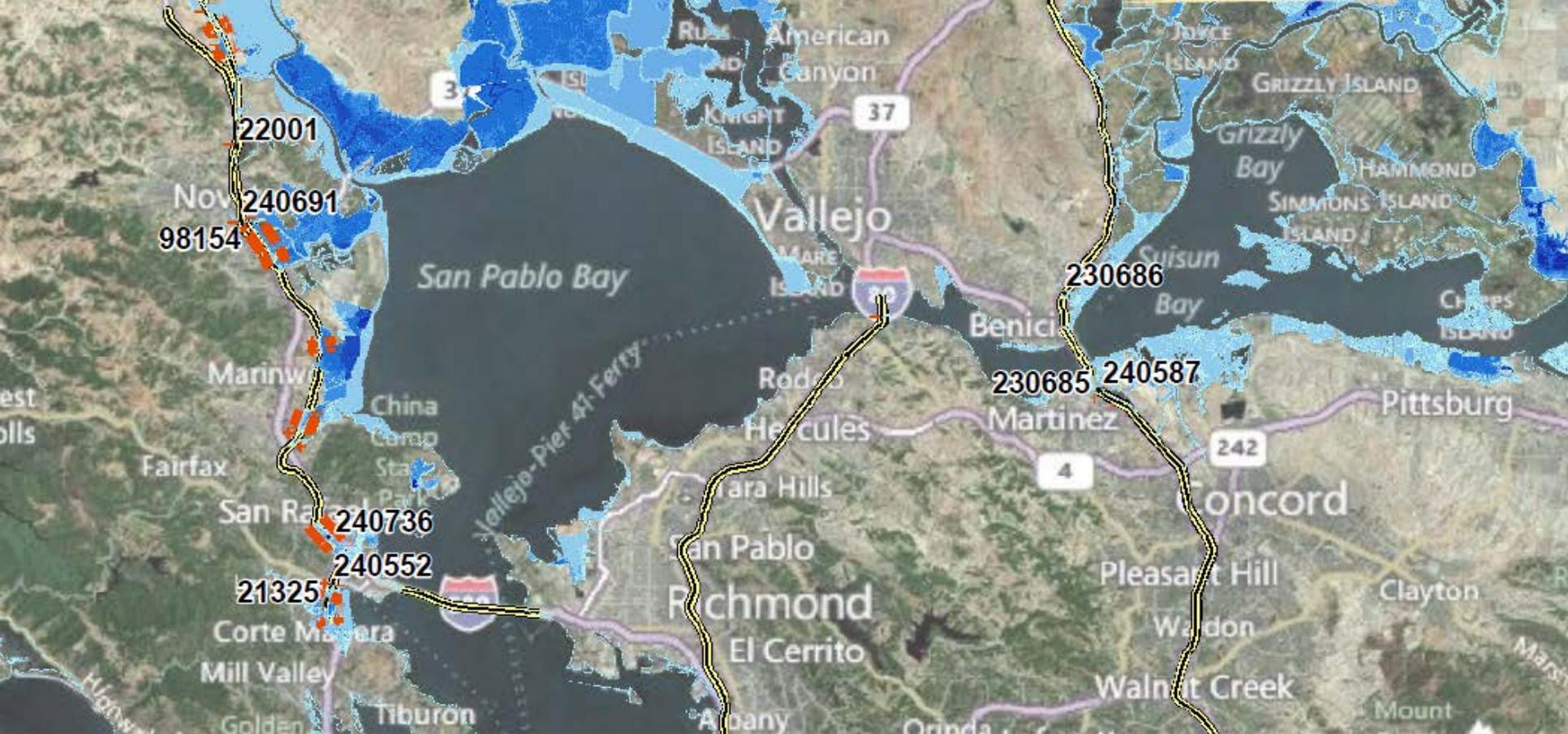


# Approach

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- Use readily available data
  - NOAA SLR inundation maps
  - Midcentury sea level rise + 1-year extreme tide (a.k.a., King Tide)
- Identify planned transportation investments and assets within the SLR inundation zone
- Identify increases in number of people, households, employees projected within SLR inundation zone





## Transportation

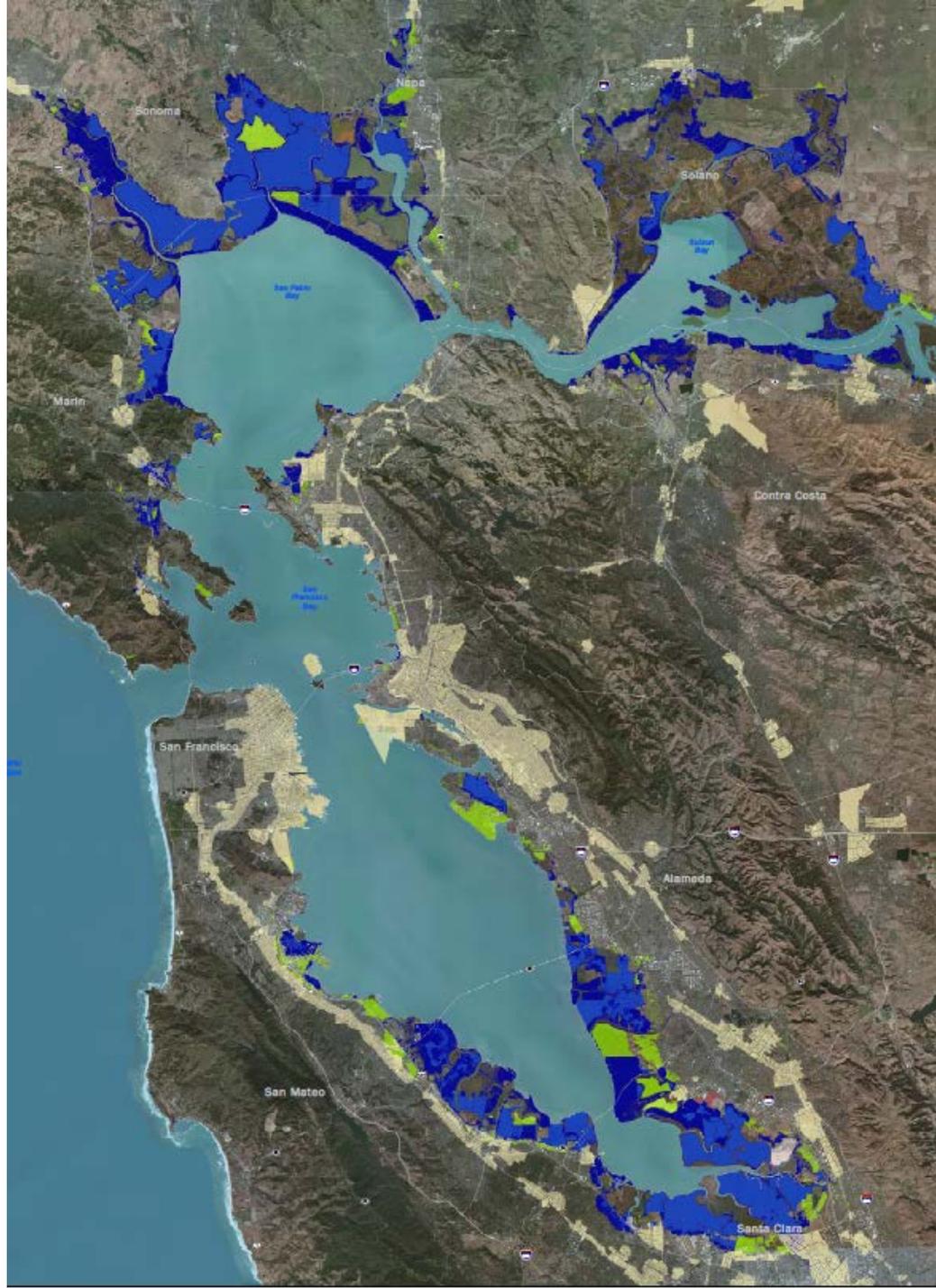
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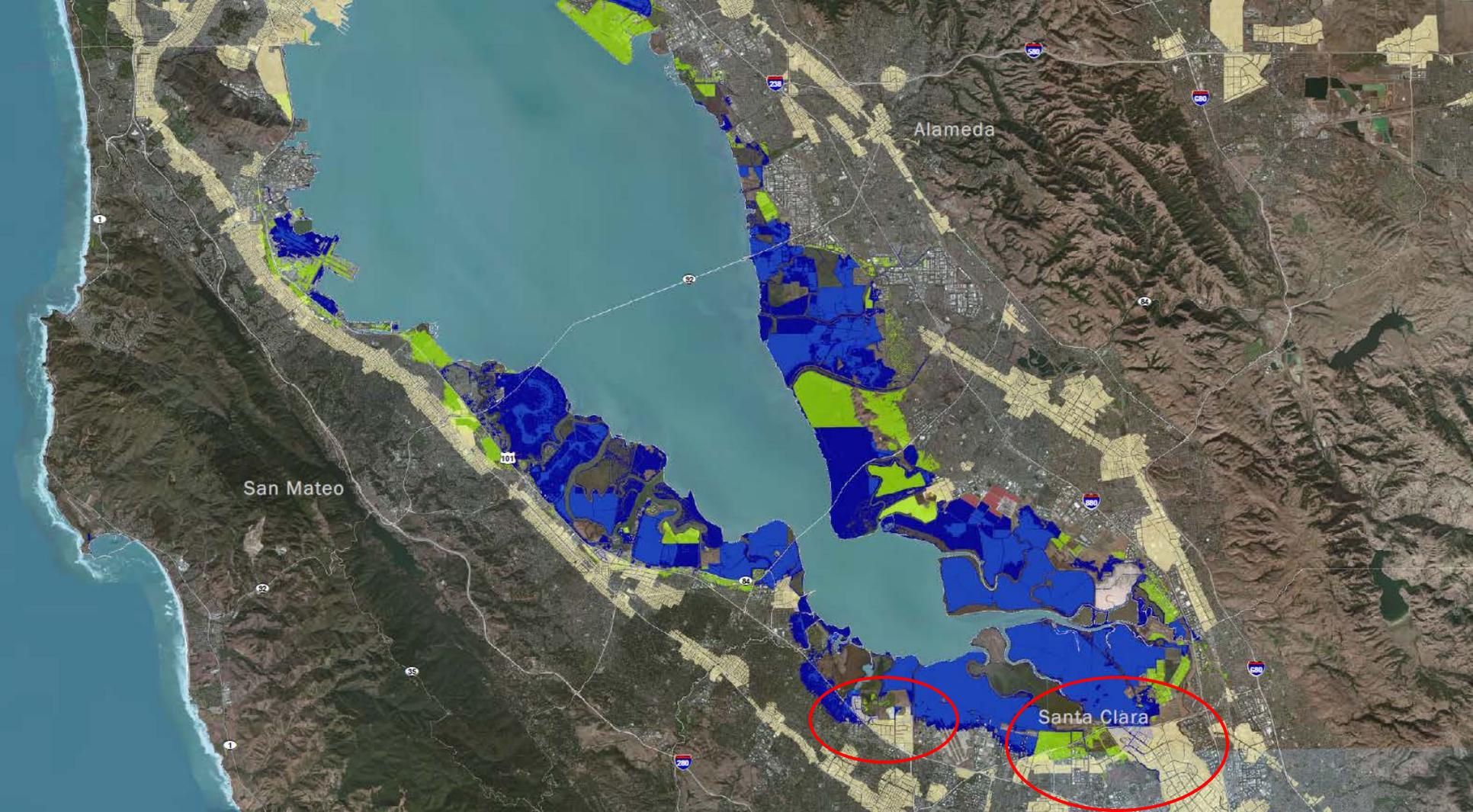
- 32 out of 700 planned transportation projects intersect the SLR inundation zone
- 21 projects are located in low-lying areas that are protected from inundation, but at risk of future inundation

# Land-use development

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- Bay Area demographic forecasts:
  - 2,105,000 more people
  - 700,000 more homes
  - 1,120,000 more jobs
- Within SLR inundation zone:
  - 104,000 more people (5%)
  - 38,000 more homes (10%)
  - 109,000 more jobs (5%)
- Within low-lying zone:
  - 60,000 more people (3%)
  - 21,000 more homes (4%)
  - 48,000 more jobs (3%)

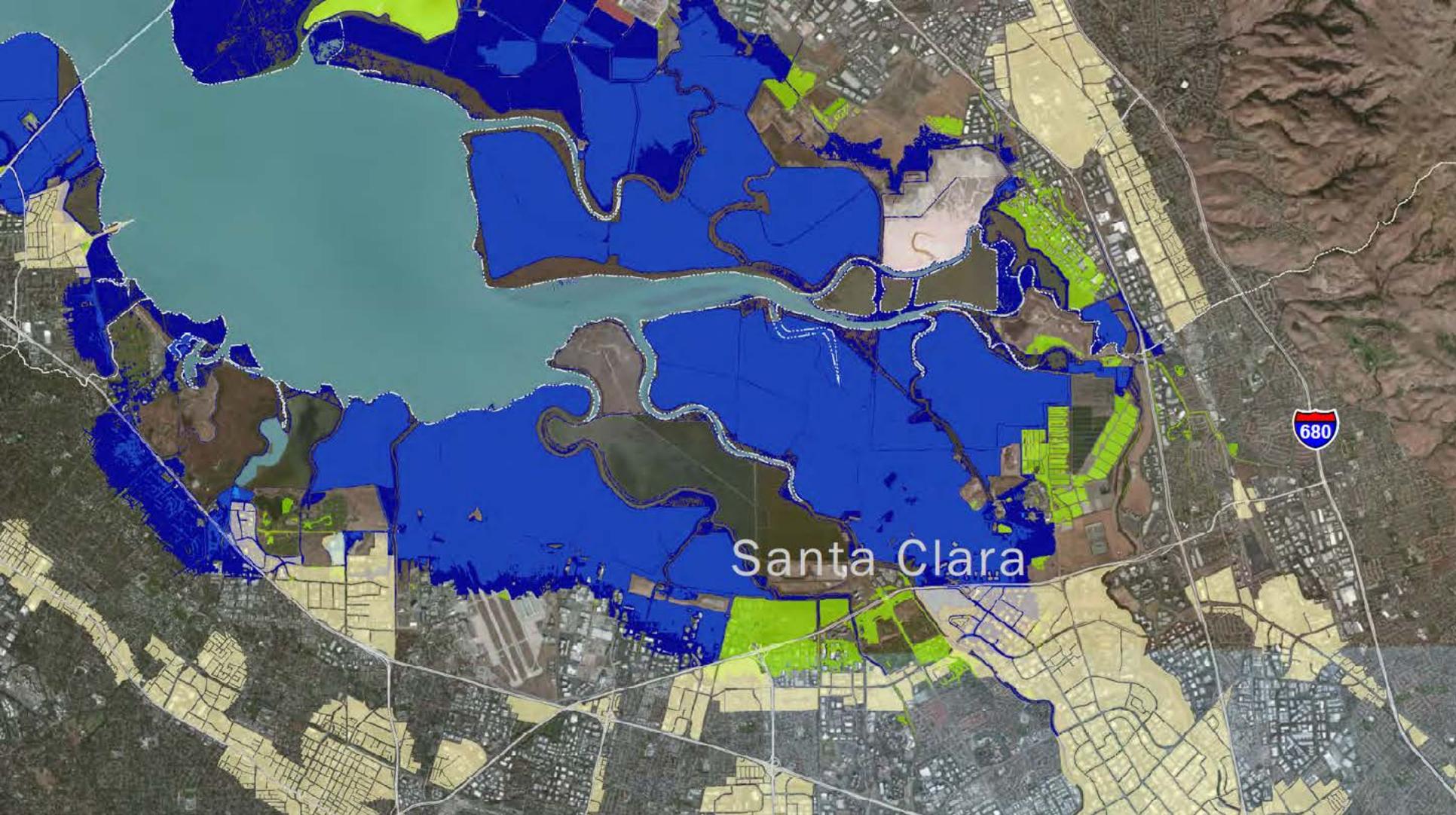




## Land-use development

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- Priority development areas are located in, or adjacent to, low-lying, at-risk areas



## Land-use development

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- Existing and future people, homes and jobs are at risk
- Long-range strategies are under development to enhance protection

# Adaptation Strategies



# Objectives

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- Serve as CEQA mitigation measures to offset significant impacts
- Identify strategies that MTC can implement
- Provide high-level menu of options for local jurisdictions
- Feasibility evaluated at later, project stage



# Approach

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- Strategies organized by outcome:
  - Protection
  - Functional Inundation
  - Inundation
  - Range of options
- Identify applicable asset type:
  - Transportation
  - Development
  - Both
- Structural + policy strategies
- Asset-specific + multiple assets



# MTC Measures: Coordination

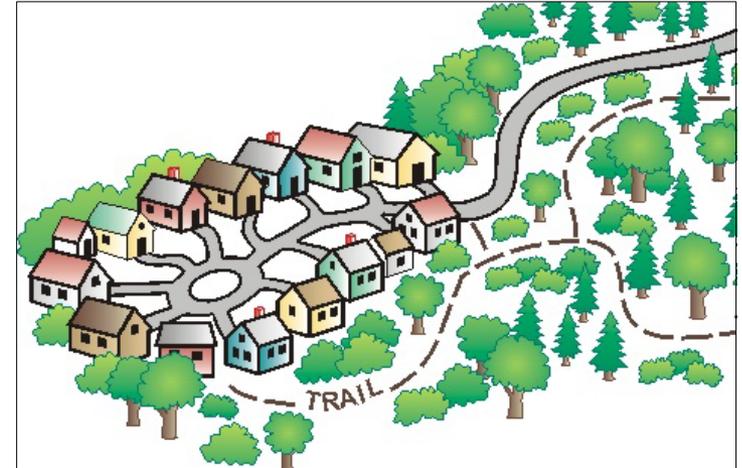
- Create TAMPs with Caltrans, cities + counties
- Conduct vulnerability + risk assessments with regional partners
- Recommend adaptation strategies for MTC-funded projects



# Local Measures: Protection

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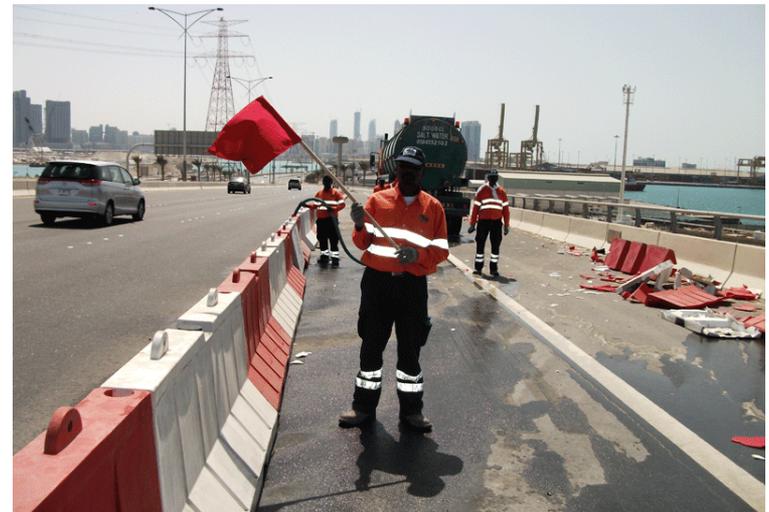
- Policy-based strategies:
  - Design / building codes
  - Zoning restrictions
  - Setbacks / buffers
  - Conditional / cluster development
  - Rolling easements / TDR
  - Prioritize low-risk development
  - Incorporate open space
- Structural strategies:
  - Elevate roads / buildings / M&E equipment
  - Relocate
  - Build / raise levee
  - Create floodwall / berm



# Local Measures: Functional Inundation

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- Structural strategies:
  - Retrofit / make waterproof
  - Use corrosion-resistant materials
  - Increase maintenance at hot spots



# Local Measures: Inundation

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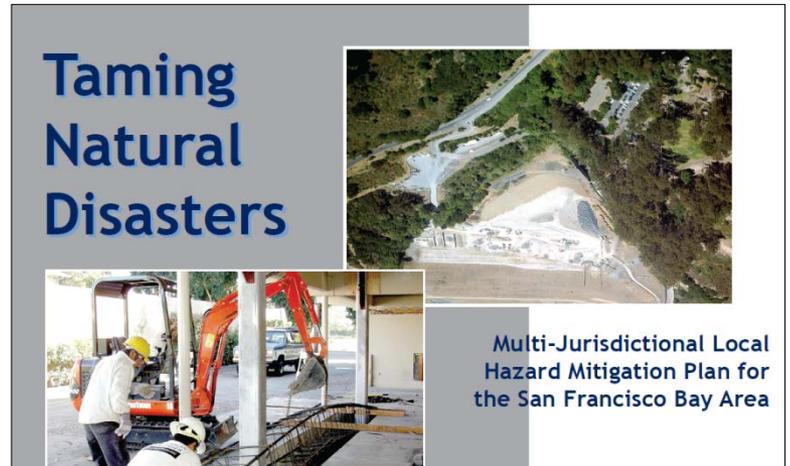
- Policy-based strategies:
  - Provide alternative route / transportation mode
  - Conduct partial / temporary closure
  - Develop emergency management plan
  
- Structural strategies:
  - Construct low-water crossing



# Local Measures: Range of Outcomes

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- Policy-based strategies:
  - Revise transportation planning guidance/policy
  - Form multi-jurisdictional partnerships
  - Create comprehensive SLR plan
  - Create/update hazard mitigation plans
- Structural strategies:
  - Create/restore/enhance wetlands
  - Beach nourishment
  - Construct shoreline armoring
  - Improve drainage
  - Build causeway



# Shoreline Types

<i>County</i>	<i>Engineered shore protection</i>	<i>Engineered flood protection</i>	<i>Berms</i>	<i>Wetlands</i>	<i>Natural Shoreline</i>
<b>Marin</b>					
Interstate & State Highways			X	X	
Bicycle & Pedestrian				X	
<b>Alameda</b>					
Interstate & State Highways			X	X	
Rail			X	X	
Transit	X				
<b>San Mateo</b>					
Interstate & State Highways		X			
Local Streets & Roads		X			
Transit			X	X	
Bicycle & Pedestrian	X				
<b>Santa Clara</b>					
Interstate & State Highways		X	X	X	
<b>Multi County</b>					
Interstate & State Highways	X		X	X	X
Rail					X

## Next Steps

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- Public Comments on Plan Bay Area and the EIR and open through May 16<sup>th</sup>.
- Final adoption of Plan Bay Area is slated for July 2013.
- Joint Policy Committee Sea Level Rise Adaptation Work Plan

Finish existing detailed risk and vulnerability assessments

Expand Phase 1 work to other parts of the region and include results in next Plan Bay Area

Develop Regional Adaptation Strategy

- FHWA Adaptation Pilot