CITY OF LONG BEACH

CAAP

CLIMATE ACTION + ADAPTATION PLAN

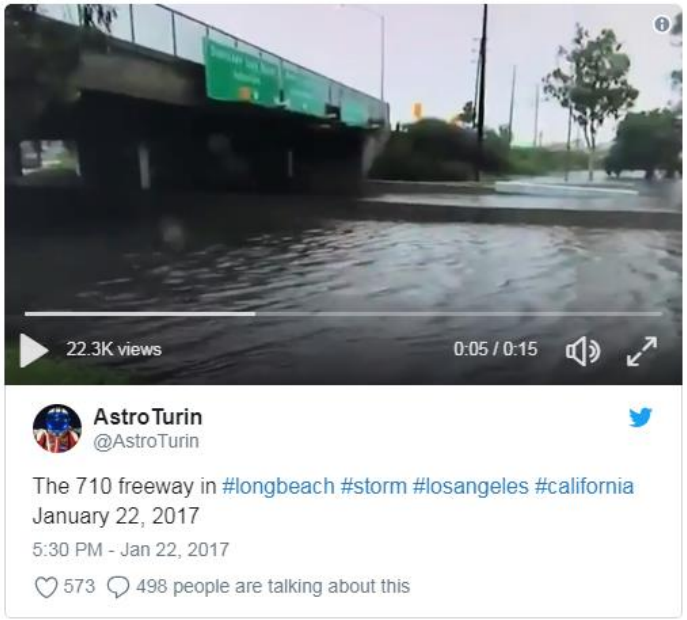
What is Climate Action?

Climate Action is…

…about reducing the impact we (people) have on the climate system by reducing future carbon emissions. *(for example, driving less)*

What is Climate Adaptation?

Climate Adaptation is…



…about adjusting our behaviors, systems, infrastructure, to reduce the impact climate change has on us. *(for example, flood proof a house)*

What is the CAAP?

- A plan to:
  - Reduce greenhouse gas (GHG) emissions
  - Prepare the community for the impacts of climate change
  - Make our communities safer and healthier
  - Enhance economic vitality in Long Beach
- How?
  - CAAP will propose a framework for creating or updating policies, programs, practices and incentives to reduce the City's GHG footprint, and ensure the community and physical assets are better protected from the impacts of climate change.

City of Long Beach Advance Planning Division

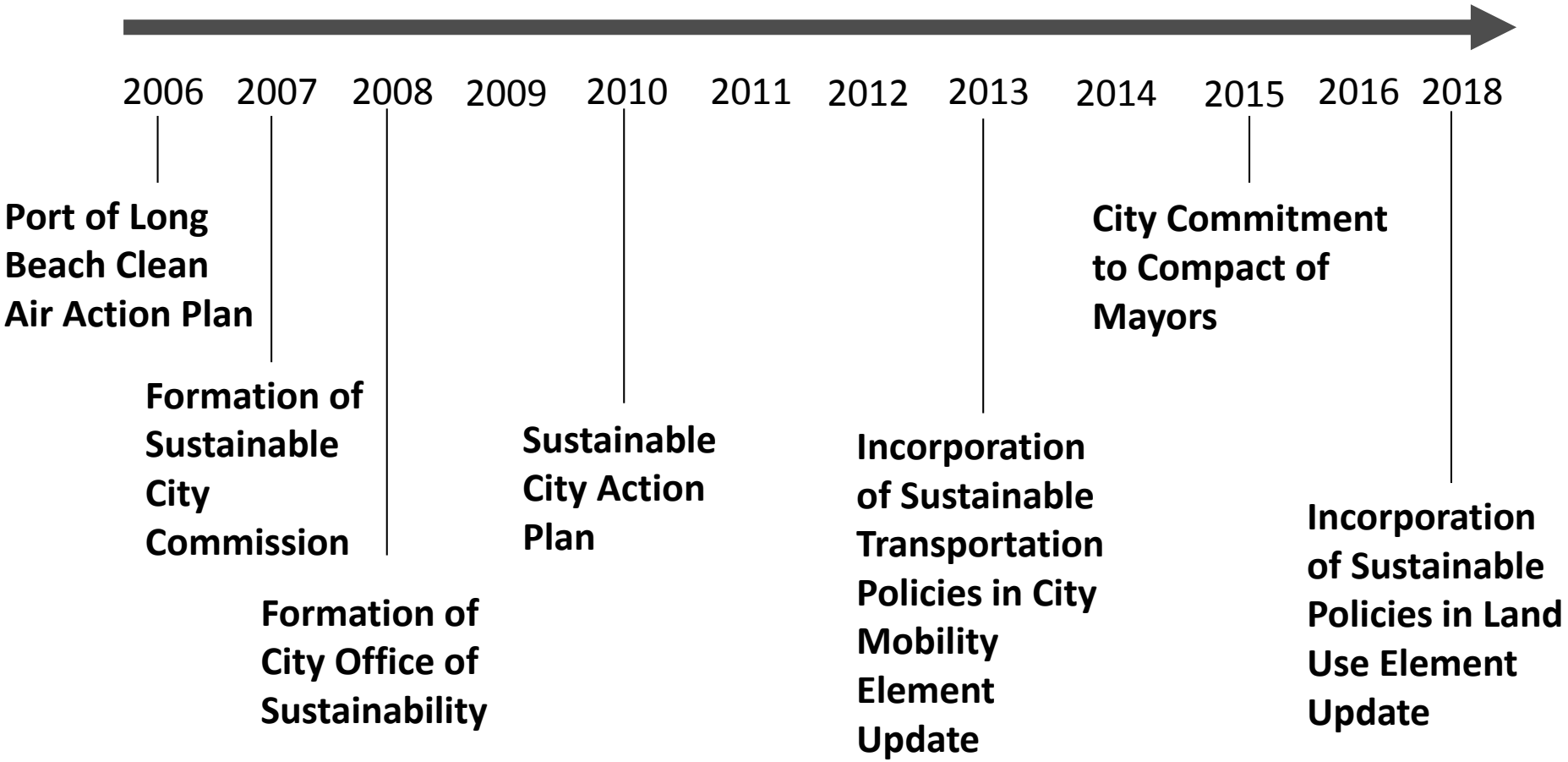
- General Plan Update:
  - Land Use Element Update
    - Climate Action and Adaptation Plan (CAAP)
    - Uptown Planning Land Use and Neighborhood Strategy (UPLAN)
  - Urban Design Element (new element)
  - Housing Element (led by Housing and Neighborhood Services Bureau)
  - Noise Element
  - Mobility Element (livability, partnership with Public Works and Health)
    - Bike Master Plan
    - Pedestrian Plan/CX3

Why Develop a CAAP?

- Meet applicable local, state, and other requirements:
  - AB 32 / SB 32 (aka California Global Warming Solutions Act of 2006)
    - Requires California to reduce its GHG emissions to 1990 levels by 2020 — a reduction of approximately 15 percent below emissions expected under a "business as usual" scenario.
  - SB 375 (Sustainable Communities and Climate Protection Act of 2008)
    - Integrate transportation, land use and housing policies to achieve emissions reductions
  - AB 691-
    - Must develop and submit a plan to the State Lands Commission for addressing sea level rise in the Tidelands area
  - SB 1000-
    - General Plans must incorporate adaptation strategies
    - Identify and address disproportionate impacts to disadvantaged communities
  - SB 379-
    - General Plan Safety Element Update must address climate adaptation and resiliency strategies applicable to that city or county.
  - CEQA
  - Global Covenant of Mayors

Historical Context

Timeline of Long Beach Sustainability and Resilience Accomplishments



Existing Plans

- California State University, Long Beach, Climate Action Plan
- City of Long Beach Climate Resiliency Assessment Report
- Port of Long Beach Climate Adaptation and Coastal Resiliency Plan
- City of Long Beach Sustainable City Action Plan

Not to be confused with….

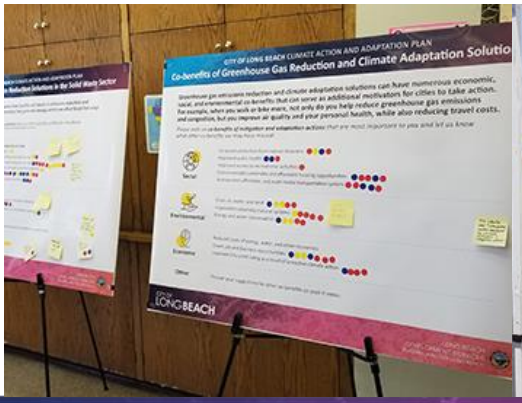
- Port of Long Beach Clean Air Action Plan (CAAP)

CAAP Goals – *Small Change, Big Impact*

- Meet applicable local, state, and other requirements
- Actionable plan (right balance of innovation and practicality)
- Holistic consideration of economic, social, and environmental co-benefits
- Inclusive of entire community, including vulnerable populations
- Pre-position Long Beach for grant opportunities
- Public-friendly, easily digestible document
- Promote healthy and prosperous community
- Invoke personal sense of responsibility among residents
- Build off existing initiatives

June 2, 2018 CAAP Open House

- Presentation on vulnerability assessment results (taped version available on website)
- Vulnerability assessment maps and boards
- Multiple ways to provide input and feedback Multi-lingual
- Sustainability resource fair Over 100 residents of all ages attended
- Feedback incorporated



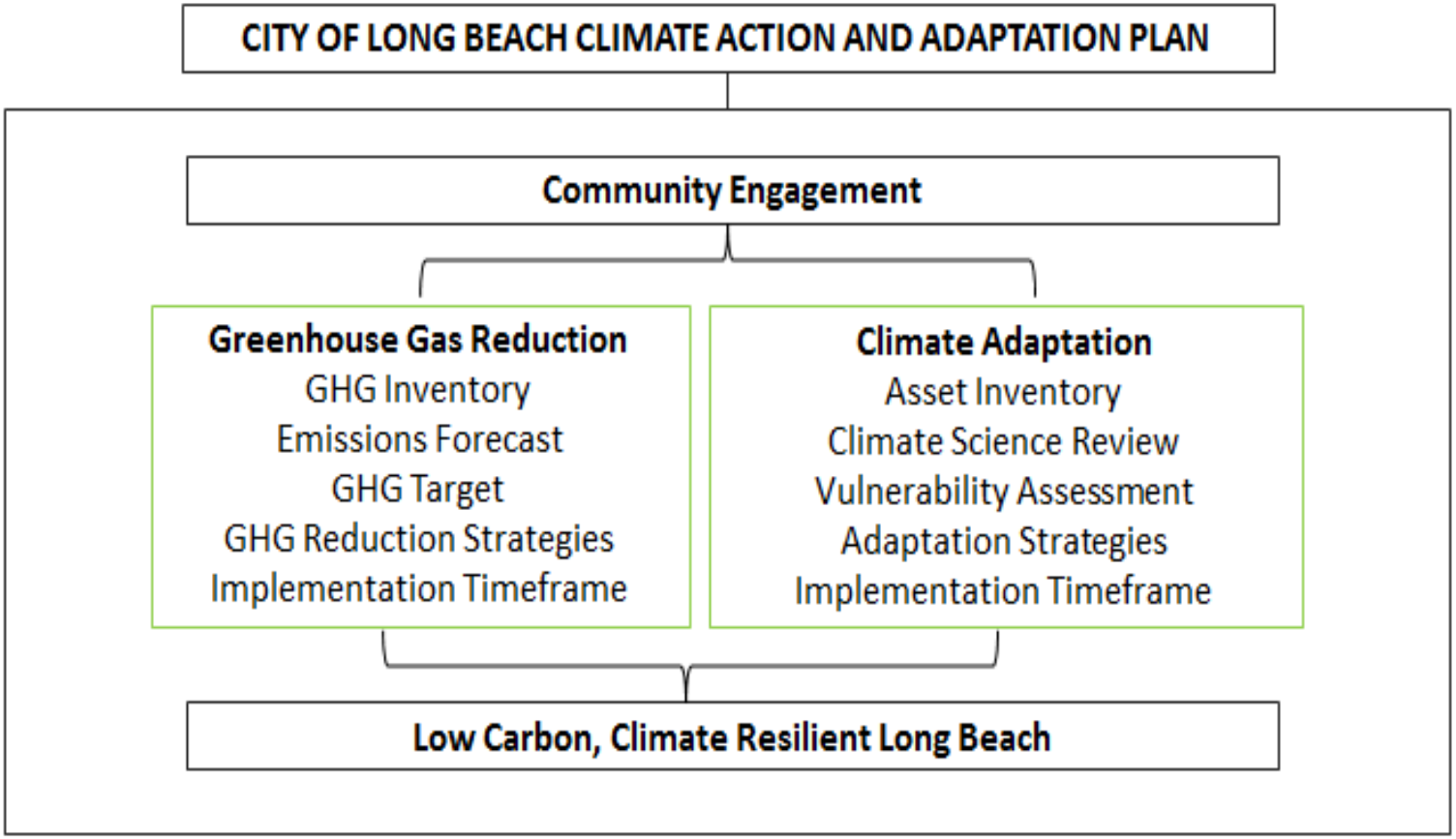
CAAP Outreach Since June 2018

CAAP Outreach Since June 2018	
CAAP Tabling at Local Community Events	16
CAAP Public Presentations	3
CAAP specific Events	1
# of Sign-ins	590
# of Estimated Attendees at CAAP outreach events	7,010

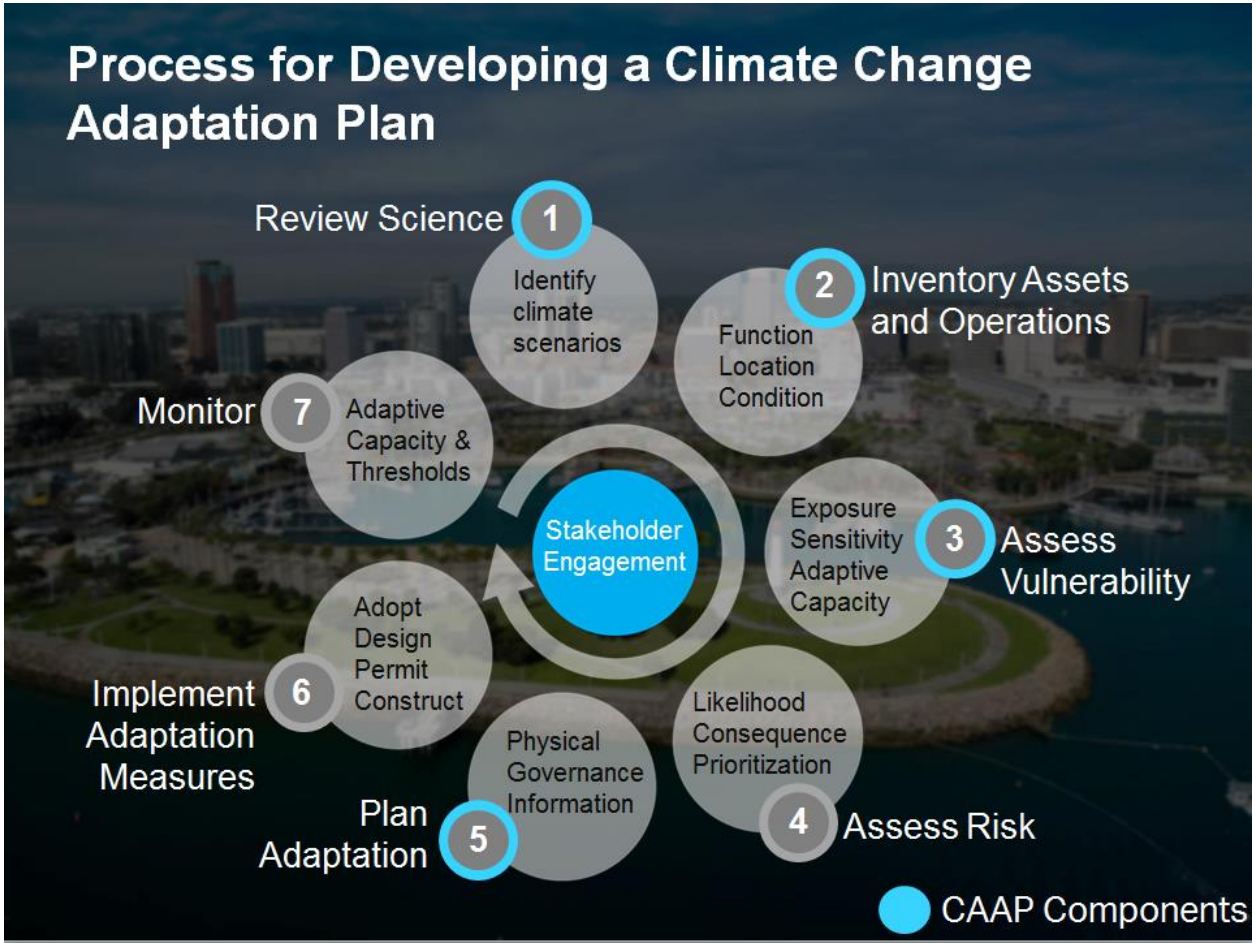
CAAP Development Process Update

- Technical Work Complete:
  - Climate stressors analysis and vulnerability assessment of critical assets
  - GHC forecast and reductions target setting
- Beginning to consider possible mitigation measures and adaptation strategies
- Ongoing community outreach and engagement:
  - June 2 2018 open house
  - 17 community engagement events across the City since June 2018
  - Jan 26, 2019 CAAP Open House #2 at Michelle Obama Library to get feedback on potential mitigation measures and adaptation strategies

Components of Developing a CAAP



Process of Developing a CAAP



Climate Science Review & Vulnerability Assessment

- **Long Beach Climate Stressors Memo** reviews best available, localized research on timing, intensity, duration and potential impacts of climate change locally
- CAAP **Vulnerability Assessment** focused on Public and Public Serving Assets:
  - Public Health
  - City Buildings and Facilities
  - Parks & Open Space
  - Transportation Assets
  - Energy Assets
  - Stormwater Assets
  - Wastewater Assets
  - Potable Water Assets
  - Private Property (limited assessment)

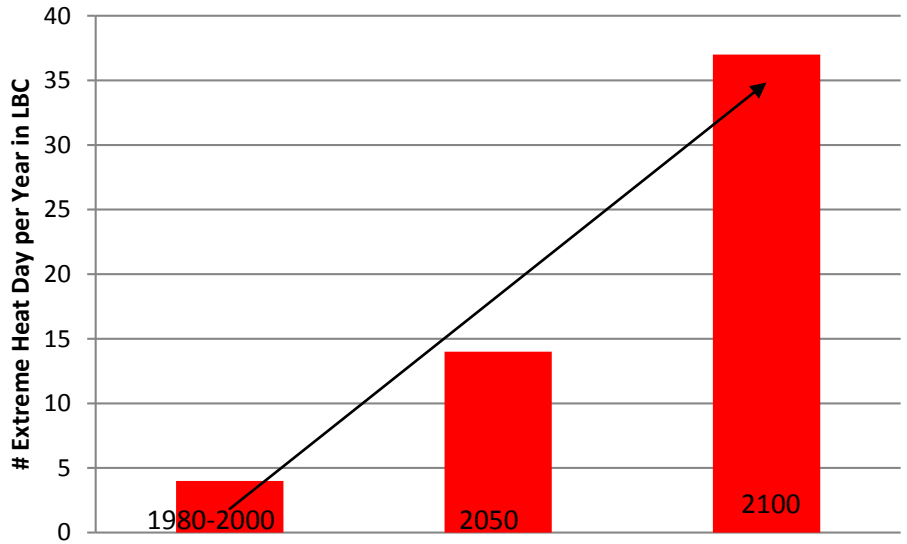
Reports available at: http://www.lbds.info/climateactionlb/
(see Resources & Documents tab)

Climate Science Review: Extreme Heat

More frequent and intense heat waves

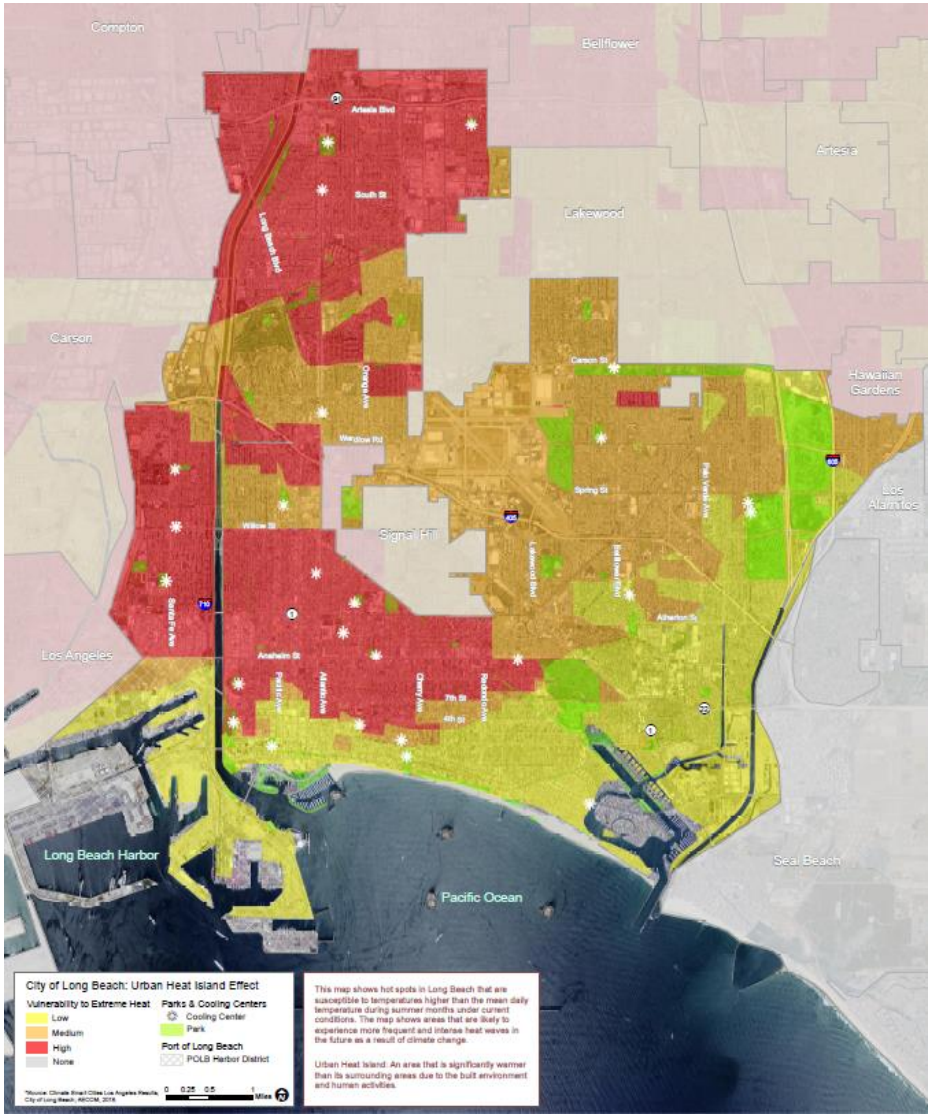
+7 to +33 more extreme heat days per year

Low income areas and communities of color are more likely to live in areas that suffer from urban heat island effect (e.g. North, Central, West Long Beach).



- Approximately 275,000 LB residents in the high vulnerability zone to extreme heat
- Increased risk of heat-related illnesses and death
- Particularly vulnerable populations include: children, the elderly, people with respiratory diseases, those who work outdoors
- Changes in temperature and precipitation may lead to changes in the spread of vector-borne diseases
- missed work and school
- Damage to roads, highways, and rail from extreme heat
- Increases in tropical pathogens, parasites, and diseases due to higher temperatures
- Example: Power outages associated with extreme heat

Vulnerability Assessment: Extreme Heat

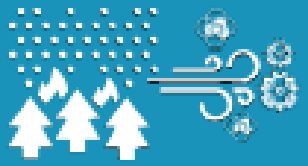


So What Do We Do About it?

Extreme heat Adaptation Measures Include:

- Construct bus shelter amenities, e.g., shade structures
- Increase presence of cool roofs, reflective streets, parking lots and playgrounds
- Increase public water supply access
- Expand cooling centers
- Develop emergency response plan for power outages related to extreme heat .
- Continue implementation of the Urban Forest Management Plan
- Increase presence of reflective surfaces
- Increase presence of shade canopies

Air Quality Impacts



Air quality is expected to worsen

High temperatures will increase air pollution formation, leading to an increase in regional wildfires, higher CO2 concentrations, and increase in pollen and some airborne allergens.

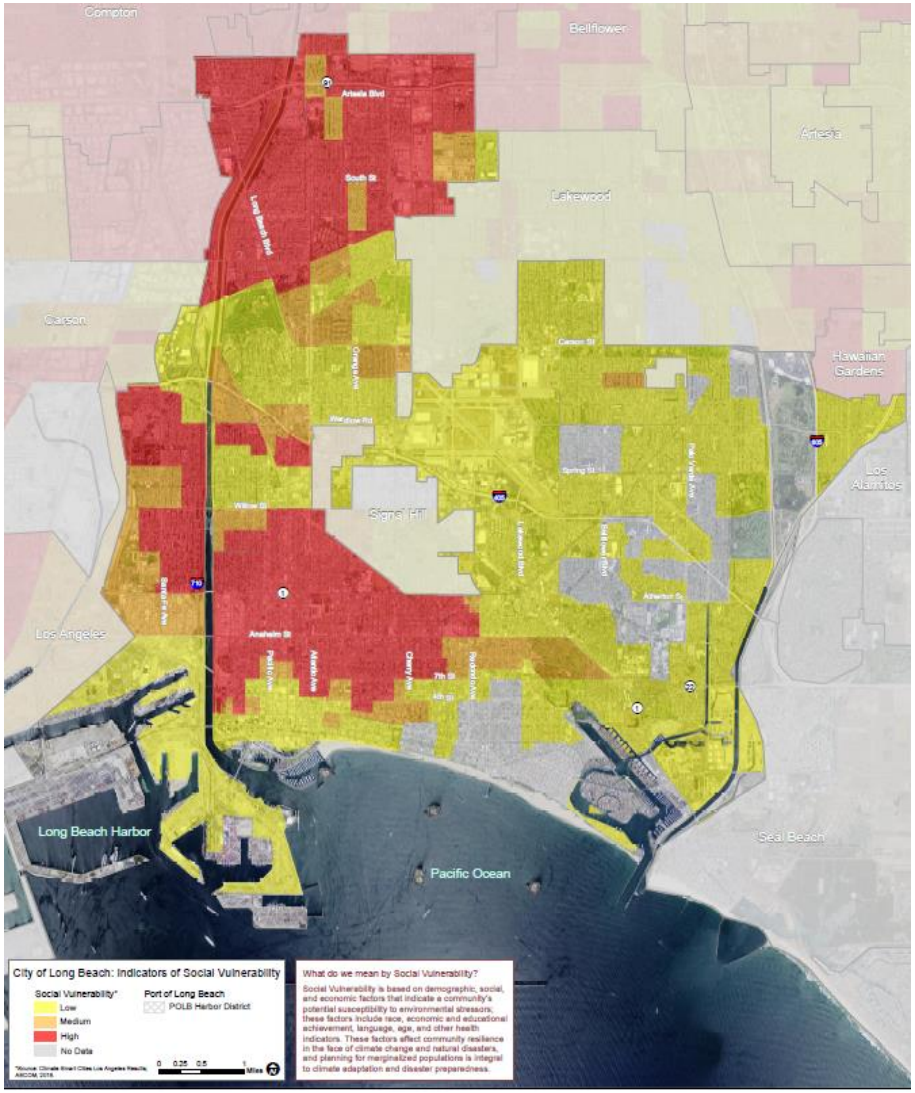
- Asthma and other cardiovascular and respiratory diseases may increase due to poor air quality and increased allergens
- Asthma hospitalizations rates are highest in West and North Long Beach and lowest in East Long Beach
- Communities in west-central and northern Long Beach are disproportionately more vulnerable to risk associated with pollution and climate change

So What Do We Do About it?

Air Quality Adaptation Strategies Include:

- Incentivize use of photocatalytic roofing tiles
- Provide incentives to convert marine vessels away from polluting fuels
- Make LB airport a center of GHG reduction innovation
- Electrification of local, small emitters (ie lawn mowers, leaf blowers)
- Electrify school buses
- Increase monitoring of oil extraction and refining process
- air quality monitoring on fleet vehicles

Social Vulnerability to Climate Change



Drought Impacts in Long Beach

The State and region is expected to have longer more frequent droughts

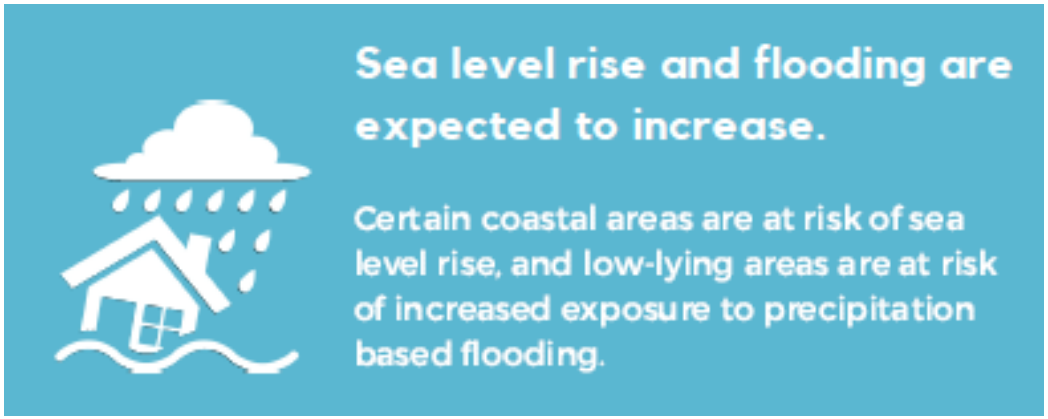
Droughts will reduce snowpack and increase intensity of runoff events in watersheds that supply water to Long Beach.

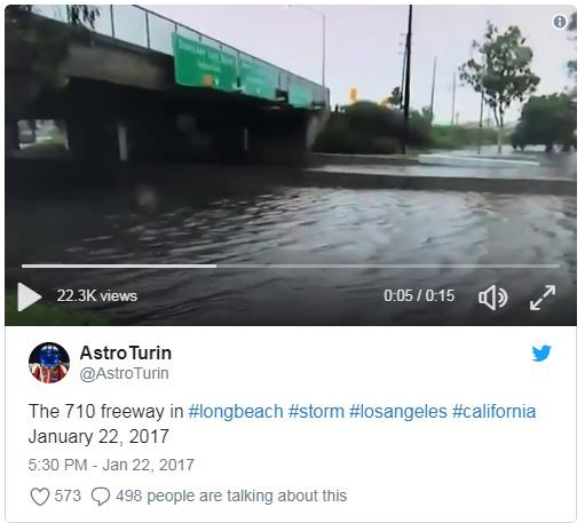
So What Do We Do About it?

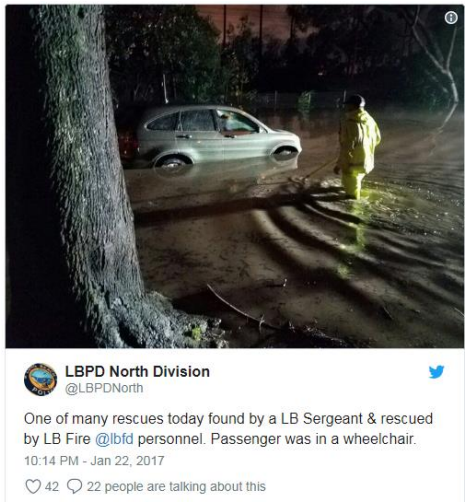
Drought Adaptation Strategies Include:

- Convert landscapes to drought tolerant plants
- Enforce strong leak detection programs
- Expand usage of green infrastructure and green streets
- Incorporate increased rainfall capture to offset imported water.
- Install atmospheric water stations
- Continue public education and outreach programs to eliminate use of storm drains for dumping hazardous wastes, such as oil
- Encourage urban agriculture practices that promote drought resilience

Riverine Flooding Impacts on Long Beach

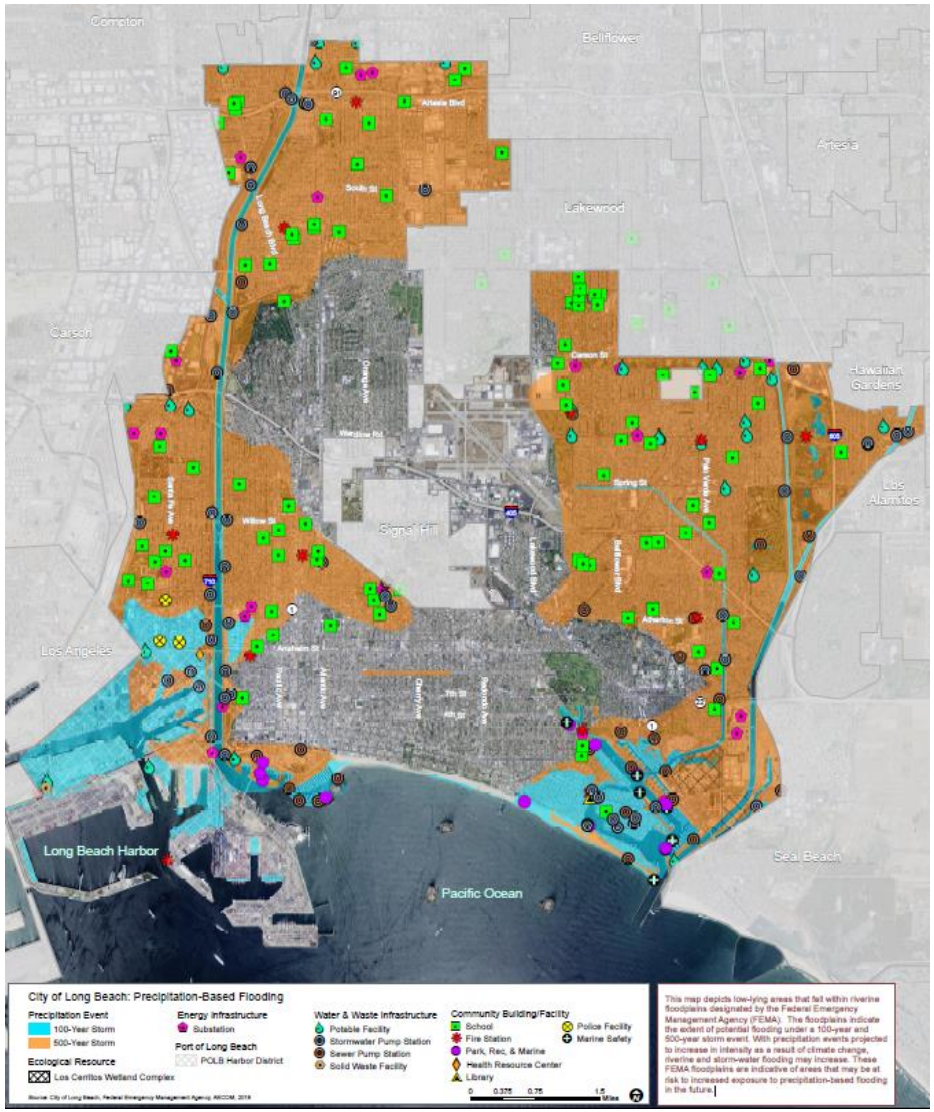






- Flooding events may contribute to injury, death, displacement, mental health burden
- According to an analysis by the Aquarium of the Pacific, with 24 inches of SLR and a 100-year storm surge, over 22,000 residents are at risk of exposure to flooding
- Sewage overflow could result in water and food-borne illness
- Damage to wastewater infrastructure and sewage backup and overflow in flooding event
- Disrupted food and water supply could cause hunger and malnutrition, particularly in low-income, children, and elderly population
- Increased risk of displacement and loss of home due to a flood event related to precipitation based flooding
- Disruptions to the transportation system could impact neighborhood connectivity including access to jobs, goods, services and healthcare.

Vulnerability Assessment: Riverine Flooding



So What Do We Do About it?

Riverine and Urban Flooding Adaptation Strategies Include:

- Develop flood event notification program
- Identify address infrastructure issues causing flood events
- Prioritize low impact development stormwater practices (bioswales, permeable pavement, etc)
- Install new pump stations
- Upgrade Storm Drain System
- Elevate critical roadways

Sea Level Rise Impacts on Long Beach

Sea level rise and flooding are expected to increase.

Certain coastal areas are at risk of sea level rise, and low-lying areas are at risk of increased exposure to precipitation based flooding.

Table 1. Sea Level Rise Projections at Los Angeles, CA from OPC (2018)

Year (Emissions Scenario)	Inches Above 1991-2009 Mean Sea Level (in)			
	Median (50% probability of exceedance)	Likely Range (67% percent likely range)	1-In-20 Chance (5% probability of exceedance)	1-In-200 Chance (0.5% probability of exceedance)
2030	4	2 to 6	7	8
2050	8	6 to 12	14	22
2100 (low emissions)	16	8 to 25	36	65
2100 (very high emissions)	26	16 to 38	49	80

Source: OPC (2018)

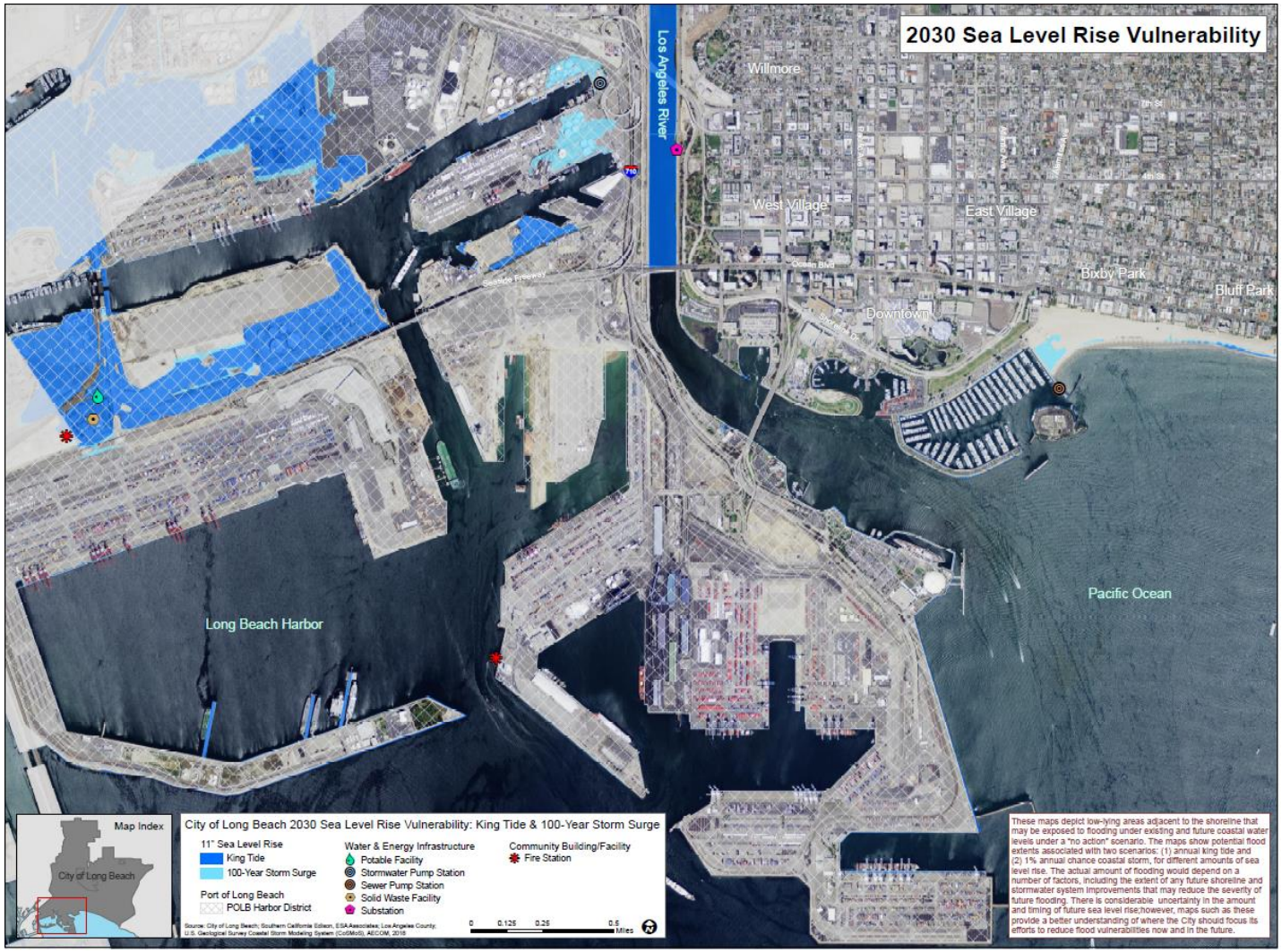
Table 2: Sea Level Rise Projections for Los Angeles, CA from NRC (2012)

Year	Southern California	
	Projection	Range
2030	5.8 ± 2.0 in	4.6 – 11.8 in
2050	11.2 ± 3.5 in	5.0 – 23.9 in
2100	36.7 ± 9.8 in	17.4 – 65.6 in

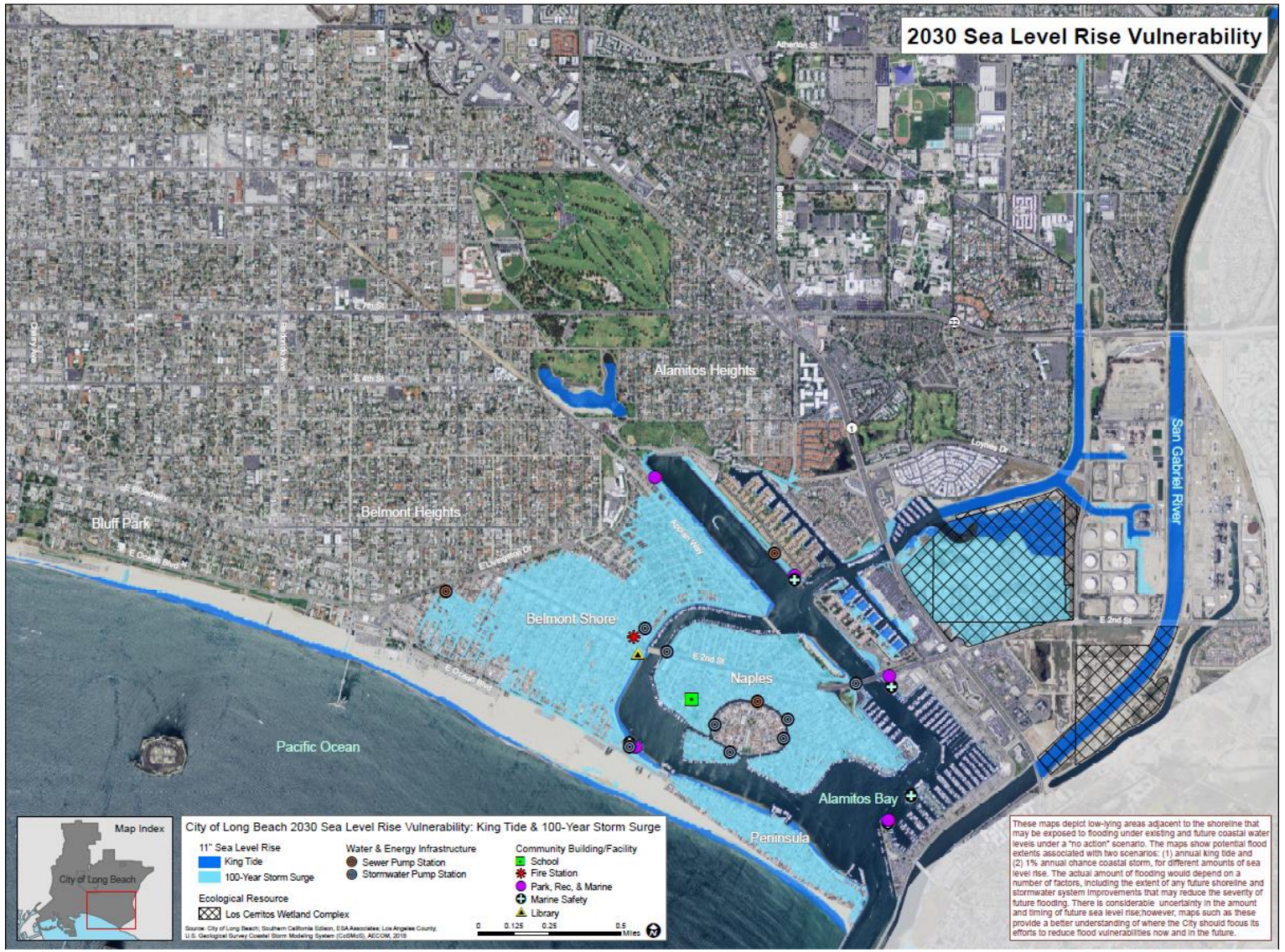
Source: NRC (2012)

- Flooding events may contribute to injury, death, displacement
- Beach inundation and erosion will increase
- Damage to coastal roads, railways, bridges
- Inundation and loss of access to marinas
- Damage or loss of critical infrastructure, including potable water, waste water, transportation infrastructure
- Damage to transportation infrastructure could inhibit or delay emergency response
- Sewage overflow could result in water and food-borne illness
- Loss of wetland habitat due to SLR. The Los Cerritos wetlands are particularly vulnerable given surrounding urban development

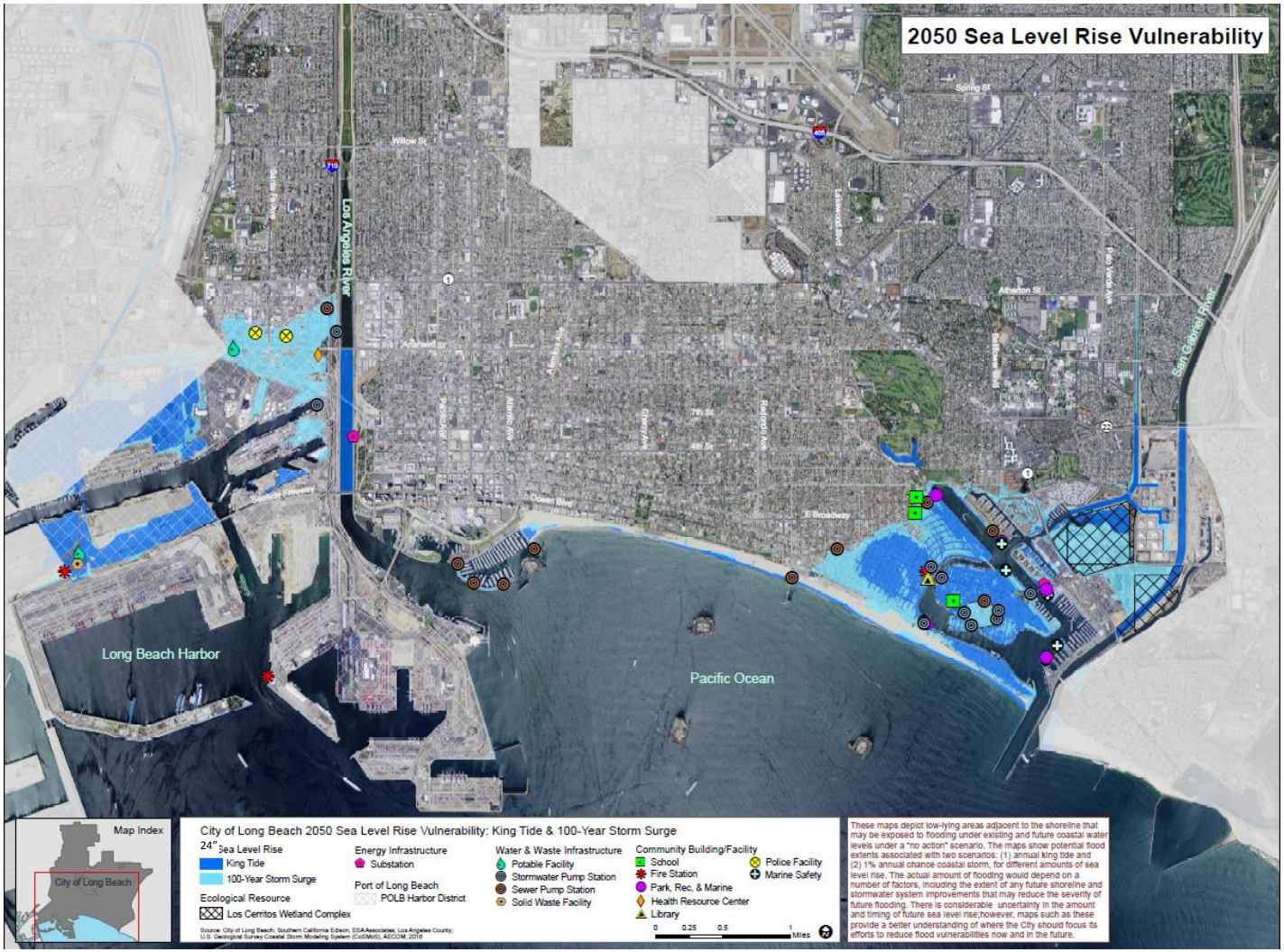
Vulnerability Assessment: Sea Level Rise 2030



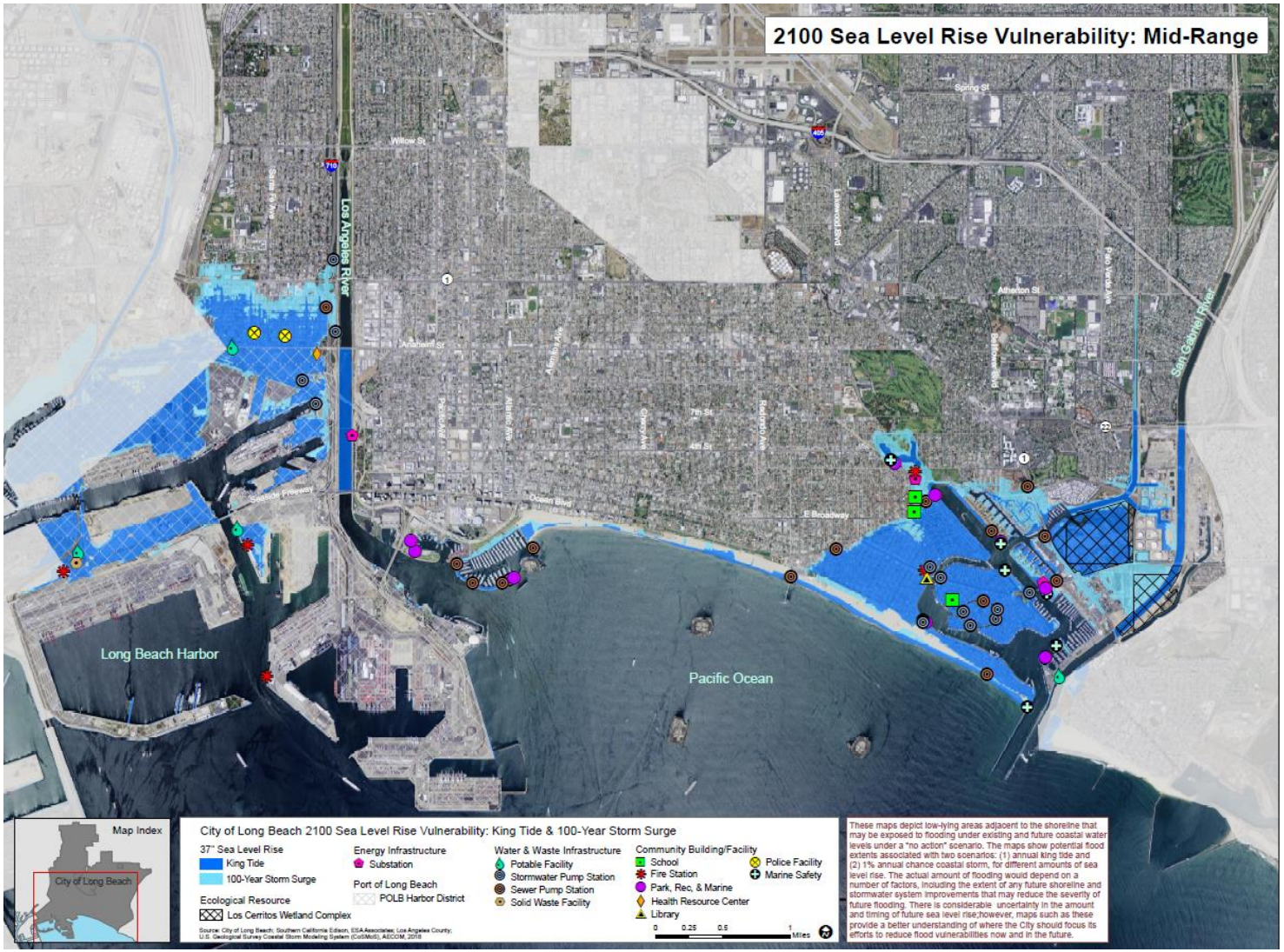
Vulnerability Assessment: Sea Level Rise 2030



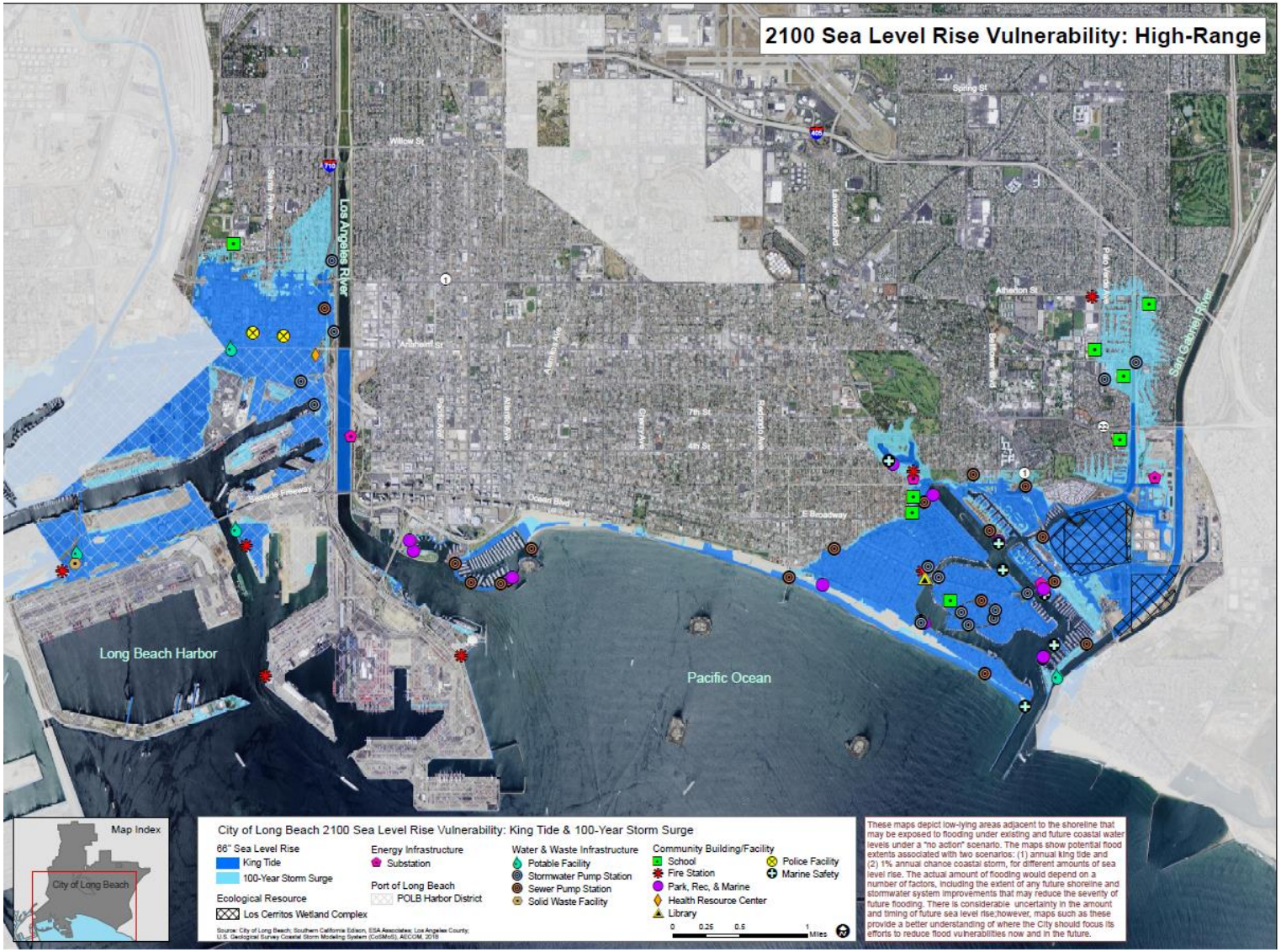
Vulnerability Assessment: Sea Level Rise 2050



Vulnerability Assessment: Sea Level Rise 2100 (mid-range)



Vulnerability Assessment: Sea Level Rise 2100 (high-range)



So What Do We Do About it?

Sea Level Rise Adaptation Strategies Include:

- Nourish beaches
- Relocate/elevate critical infrastructure
- Elevate homes/businesses
- Monitor breakwater
- Update City emergency response plan
- Active and/or passive dune restoration
- Groundwater monitoring program
- Update floodplain management ordinance

Fiscal and Economic Impacts

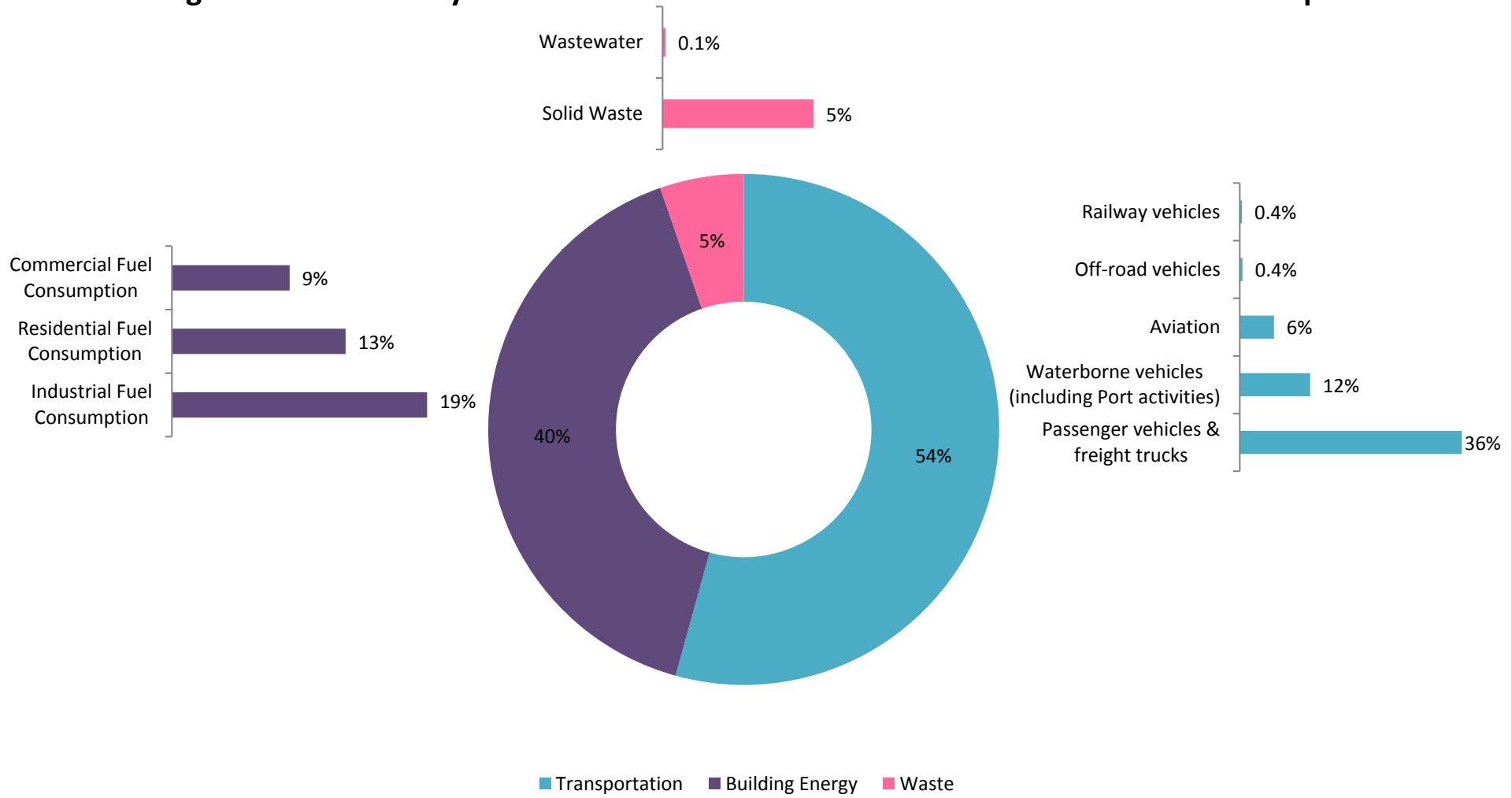
- The City is evaluating cost of Climate Change with annual costs in the millions of dollars and total cumulative costs in the hundreds of millions by 2050. Exact costs represent substantial assumptions and uncertainty
  - Infrastructure upgrades and replacement
  - Increased emergency-response costs
  - Decreased property-tax revenues
  - Impaired tourism and recreation facilities

Process of Developing Mitigation Measures

GHG Inventory

What is the City's emissions profile?

Total Long Beach Communitywide Emissions: 3.3 Million Metric Tons of Carbon Dioxide Equivalent



So What Do We Do About it?

Emissions Reduction Target Setting

Figure 3 – Target Options in Mass Emissions

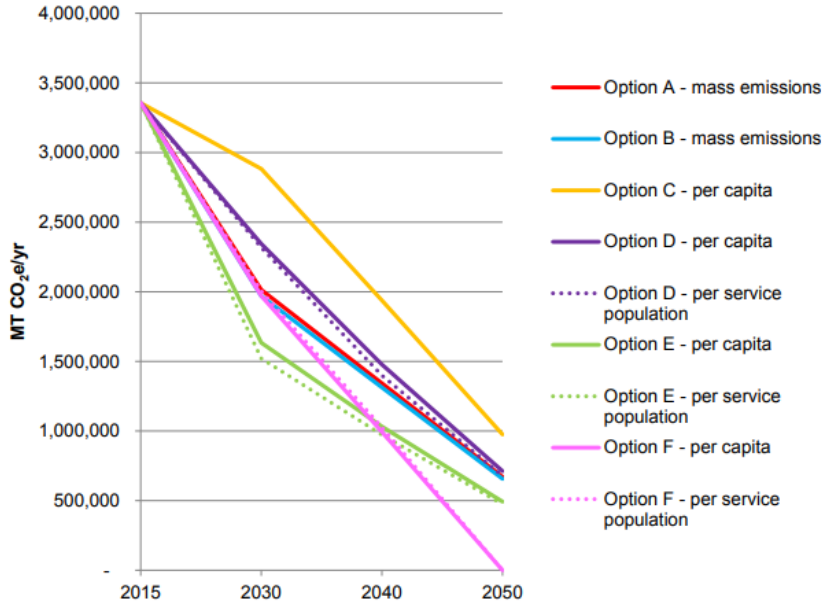
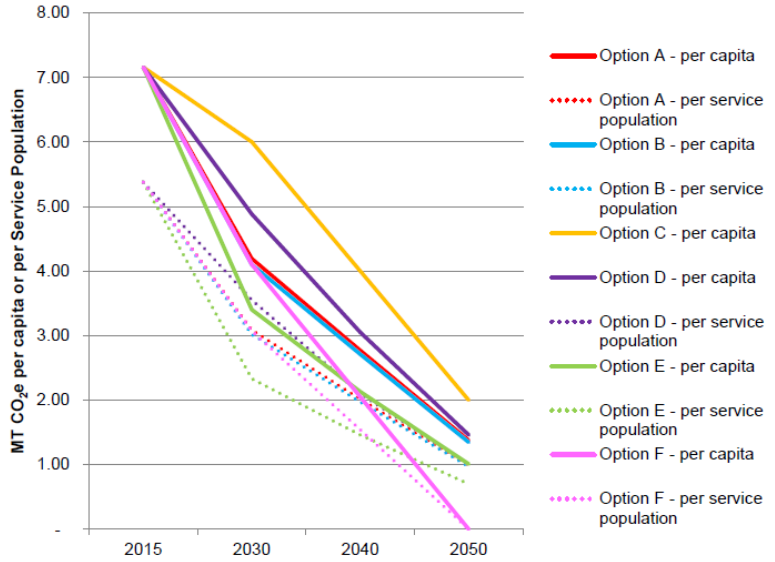


Figure 4 – Target Options in Emissions Efficiency



Mitigation Measures: Transportation

Reminder: Transportation is 54% of emissions in the City

Transportation Mitigation Measure Category	Examples
Transit Service Enhancements	• Increase frequency and connectivity of transit options • Improve transit stop/station environments • Increase employment and residential development along transit corridors
Active Mobility	• Expand the City's bike share program • Expand pedestrian infrastructure citywide
Electric Vehicle Deployment	• Develop an EV infrastructure master plan • Implement EV car-share program in low-income communities
Transportation Demand Management	• Update the City's transportation demand management (TDM) ordinance • Incentivize ride-sharing, biking and transit programs citywide
Land Use and Transportation Planning	• Increase density and mixing of land uses • Integrate SB 743 planning with CAAP process

Mitigation Measures: Building Energy

Reminder: Buildings are responsible for 45% of emissions in the City

Building Mitigation Measure Category	Examples
Renewable Energy	• Providing access to renewable energy
Energy Efficiency	• Develop a mandatory commercial building energy benchmarking program, • Develop a home energy audit program, • Encourage Long Beach major energy users to participate in SCE's time-of-use electricity rates

Mitigation Measures: Waste

Reminder: Waste is responsible for 5% of emissions in the City

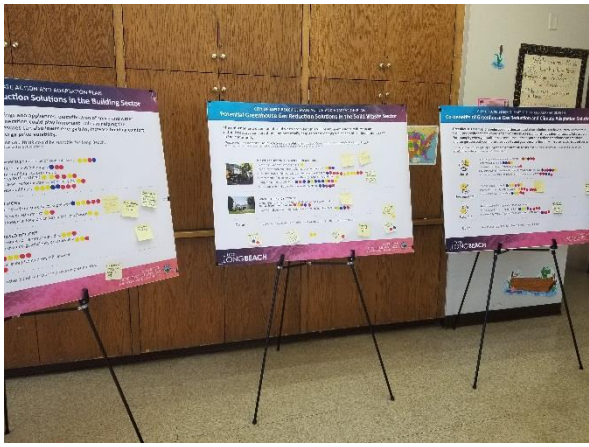
Waste Mitigation Measure Category	Examples
Waste Reduction and Diversion	• Enhance outreach and awareness campaign for waste diversion • Maintain compliance with state law for commercial, multi-family and residential recycling programs • Increase community awareness of consumption-related emissions
Waste-to-Energy	• Develop a residential organic waste collection program that complies with state law • Ensure/increase compliance with new state law regarding requirements for multi-family residential and commercial property organic waste diversion • Identify opportunities for anaerobic digestion of organic waste

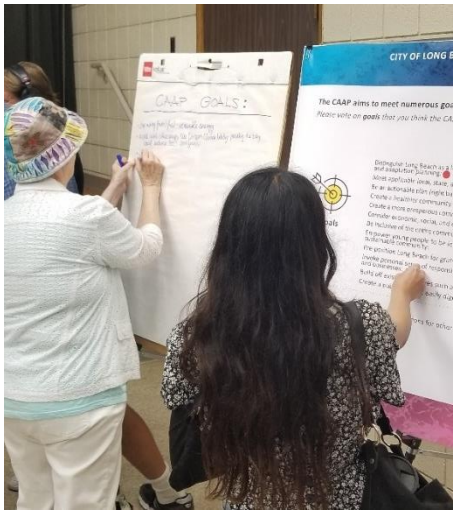
Other Mitigation Measure Categories

Other Mitigation Measure Categories	Examples
Cross Sectoral	• Develop a sustainability plan for Long Beach Airport • Implement the Clean Air Action Plan for the Port of Long Beach • Implement Green Business Program • Increase carbon sequestration potential in Long Beach • Improve local food system options
City Government Actions	• Perform building energy audits on city buildings/facilities to identify energy and cost savings opportunities • Increase construction of municipal zero net emission buildings • Develop solar audit of city facilities • Increase alternative fuel vehicle use in City Fleet • Provide vegetarian options at City-sponsored events

CAAP Development Process: Looking Ahead

- Reviewing and getting feedback on draft mitigation measures and adaptation strategies in detail with the Scientific Working Group, Business Working Group, Community Working Group
- 1/14- Special Topic Panel: Sea Level Rise and What Homeowners Can Do To Prepare
- 1/26 Citywide Open House
- 30 day public comment period on draft measures/strategies
- Draft plan anticipated March 2019





Learn More, Get Involved, Share Ideas!

You're invited!

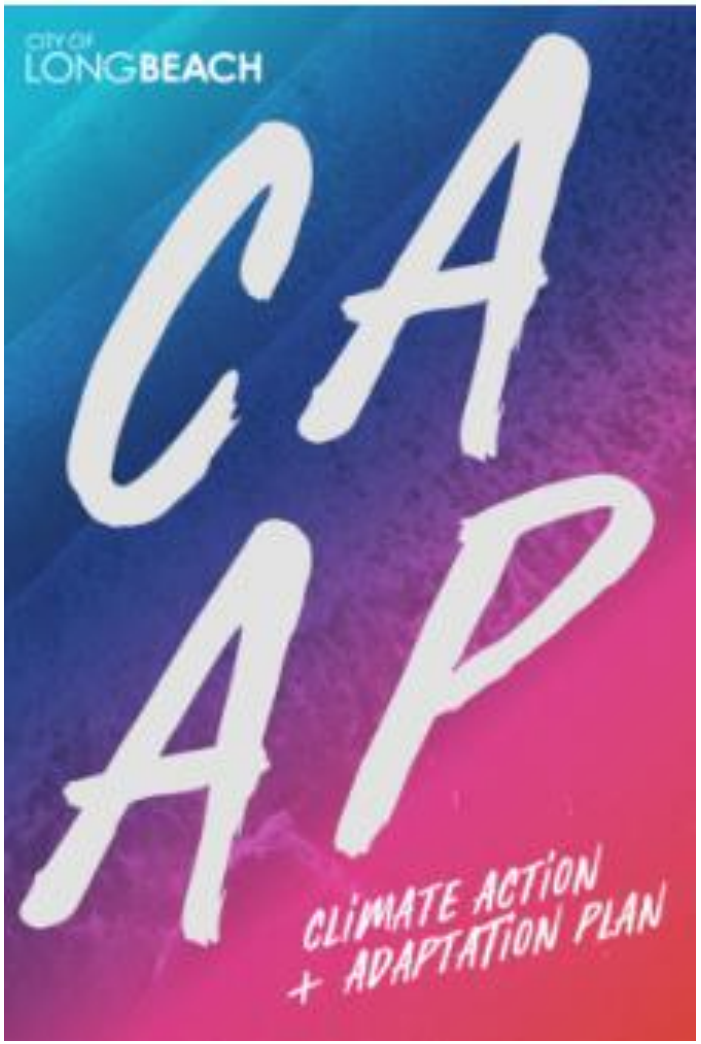
The second CAAP Public Open House scheduled for:

Saturday, January 26, 2019

Stop by between 10 a.m. – 1 p.m.

Michelle Obama Library

Provide your feedback on potential mitigations and adaptations, sustainability resource fair, family friendly activities, refreshments



Stay involved!

- Visit our website to review these assessments, to take the CAAP survey and for more info on the project: http://www.lbds.info/climateactionlb
- #CAAPLB
- Sign-up for alerts via LinkLB (see website)


SMALL
CHANGE
BIG
IMPACT