City of Long Beach Climate Action and Adaptation Plan (CAAP)

What is the CAAP?

The CAAP is a comprehensive planning document outlining the City's approach both to reduce greenhouse gas emissions in Long Beach and prepare the community for the impacts of climate change. The CAAP will provide a framework for creating or updating policies, programs, practices, and incentives for Long Beach residents and businesses to reduce the City's GHG footprint, and ensure the community and physical assets are better protected from the impacts of climate change.

Why do we need it?

Without action, climate change impacts such as worsening heat waves, sea level rise, drought, and reduced air quality could have significant negative impacts on our communities. The CAAP includes actions and strategies to protect our health, economy, and quality of life, and do our part to protect our climate. The CAAP is a mitigation measure of the Long Beach General Plan Update and will help the City meet its legal obligations related to statewide greenhouse gas reductions while also helping the City comply with commitments including to the Global Covenant of Mayors.

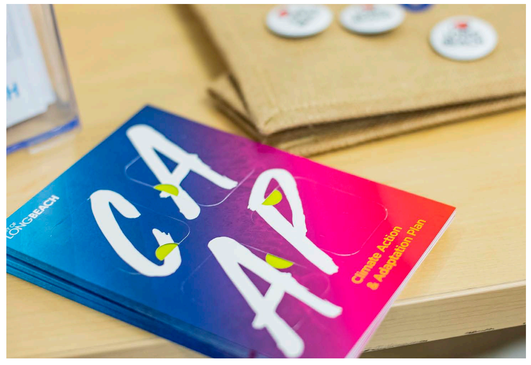
What are the CAAP goals? The CAAP goals were based on community input and include:

- Distinguish Long Beach as a leader in climate mitigation and adaptation planning
- Be inclusive of the entire community while prioritizing vulnerable and disproportionately impacted populations
- Create a healthier community by addressing climate change
- Meet state requirements for local greenhouse gas reduction
- Consider social, environmental, and economic co-benefits holistically
- Empower young people to be leaders in creating a most sustainable community
- Invoke personal sense of responsibility among residents and businesses
- Be an actionable plan (right balance of innovation and practicality)

The CAAP Development Process

How have we been engaging the community and stakeholders?

In 2018, staff set out to create an inclusive, community-centered planning process to engage the Long Beach community broadly and with attention to those most affected by climate change. The community engagement strategy for CAAP was based on an equity assessment conducted in partnership with other City departments including the Department of Parks, Recreation and Marine, and the Health and Human Services Department. The City community engagement efforts have reached over 8,500 residents at nearly 50 events including: community meetings, open houses, resource fairs, cultural festivals, and panel discussions across the city.



The City also convened working groups to engage key stakeholders:

- **Scientific Working Group** of independent experts to review methodology and provide feedback
- **Business Working Group** to provide input on existing actions, future opportunities and concerns
- **Community Working Group** to engage and receive input from local community groups

In addition, community engagement strategies included:

- Project Website: www.lbds.info/climateactionlb
- Social media outreach with #CAAPLB & #ClimateActionLB
- E-newsletters
- Online surveys and comment cards
- Animated videos and infographics
- Translation services at all CAAP workshops
- Free tchotchke/giveaways

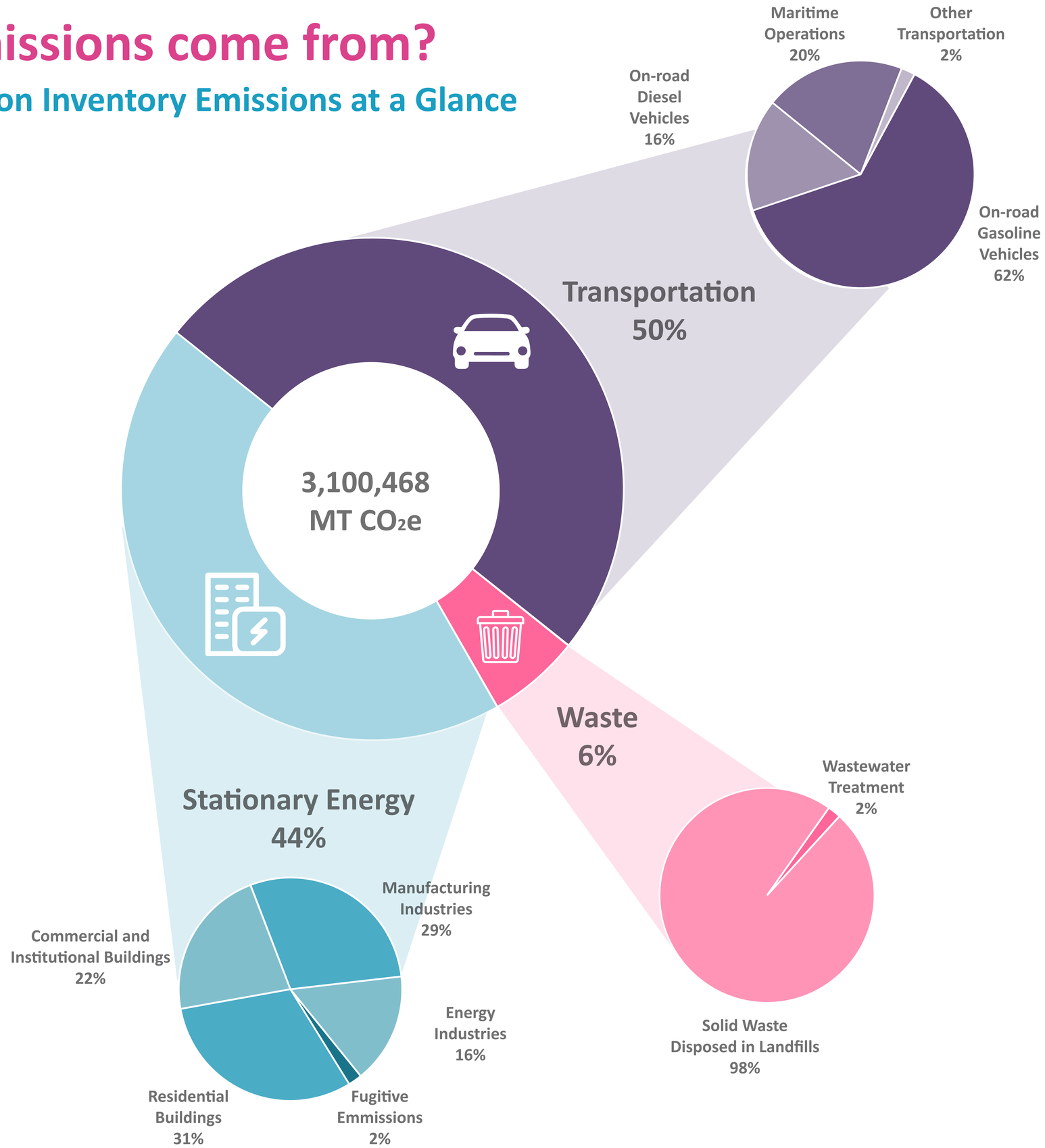
✓ Collaboration with every City Department

✓ Collaboration with each Council Office (including at least 1 event in every district)

✓ Emerging leaders and youth focus in partnership with local schools and universities

Where do our emissions come from?

Long Beach 2015 Production Inventory Emissions at a Glance



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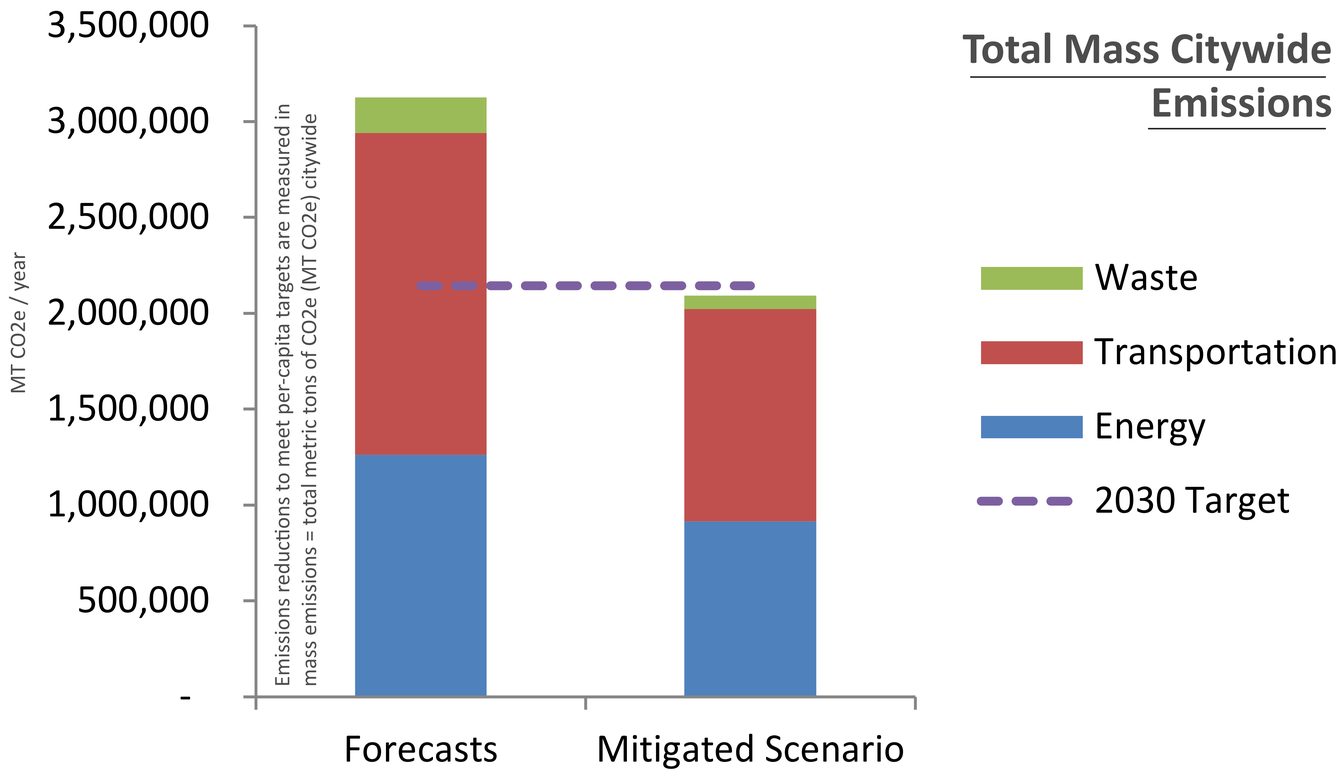
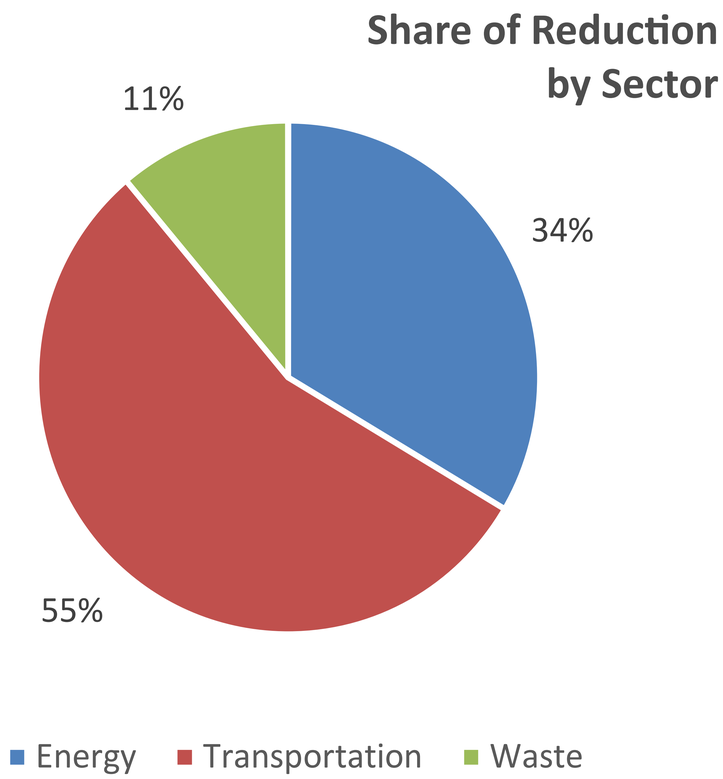
2030 GHG Reduction Target

What is our 2030 GHG Reduction target and how do we meet and exceed it?





2030 Target

- Reduce per capita emissions from 6.57 to at least 4.46 MTCO2e (33% reduction compared to forecasts)
- Requires a total of ~1 million MTCO2e reductions

Total of 19 prioritized actions to meet this target

- Focused on reducing emissions and co-benefits such as health and quality of life, especially in low-income and disadvantaged communities

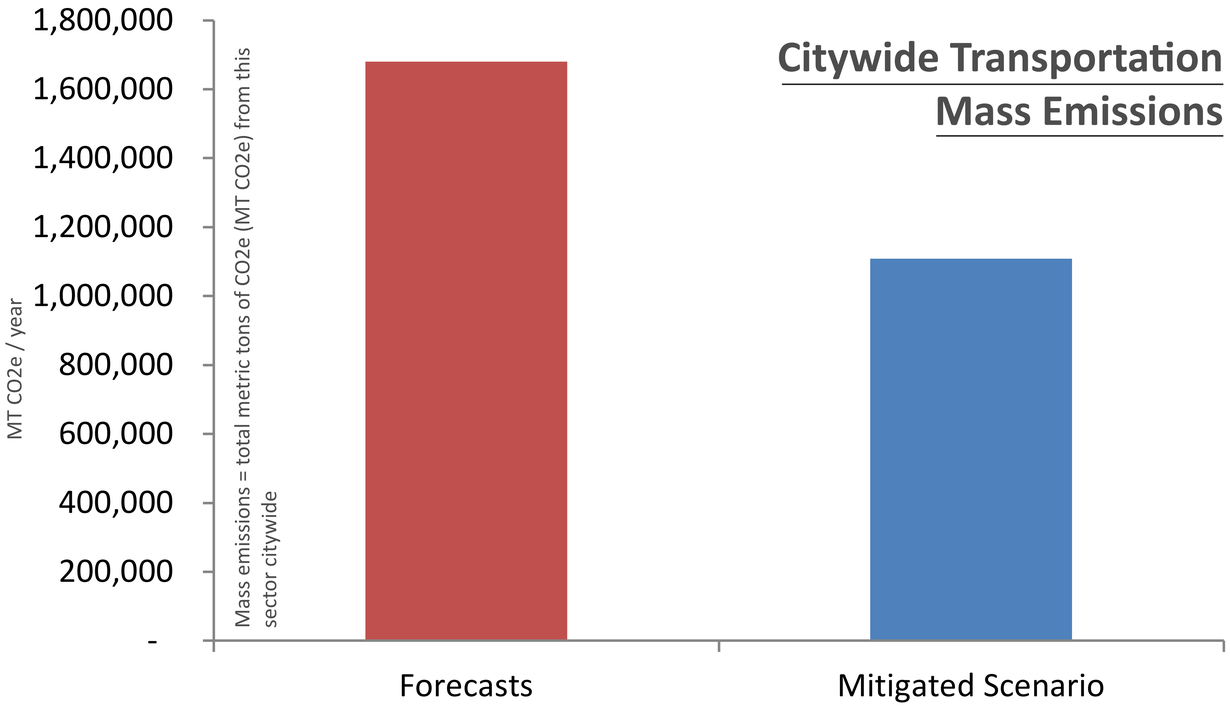
Keeps us on track to meet key targets

- Keeps the City on track to achieve its share of reductions through 2030 in alignment with the Paris Agreement's goal to limit warming to 2°C
- Also keeps the City on track to reduce emissions 40% below 1990 levels in alignment with state targets

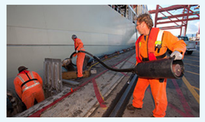
Two-thirds of GHG 2030 Reductions achieved from 3 actions:

- Renewable electricity powering homes, businesses and industry
- Port Clean Air Action Plan implementation
- Organic Waste Diversion Actions

2030 Transportation Sector Actions

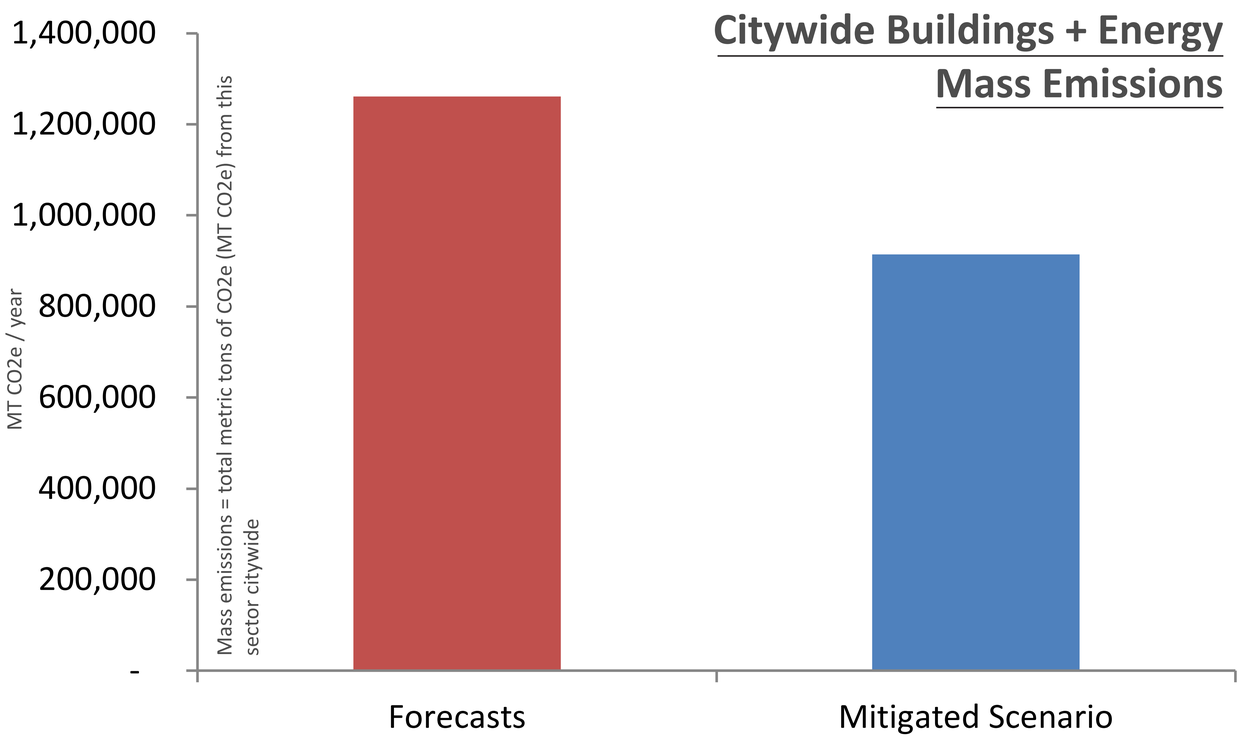


- 33% reduction in transportation sector emissions by 2030 (compared to forecast)
- Fewer miles driven by cars and trucks, and more walking, biking, and use of public transit is needed to meet this reduction
- Also includes the impact of state actions and the General Plan Land Use Element update that focuses new housing near transit
- Total of 9 transportation sector actions

Action		What It Does
	**Implement the Port of Long Beach Clean Air Action Plan**	Continue to implement the Clean Air Action Plan to reduce GHG emissions and pollution from Port ships, trucks, trains, harbor craft, and cargo equipment.
	Increase frequency, connectivity, and safety of transit options	Evaluate transit service and routes, identify opportunities to increase frequency, connectivity and safety to increase ridership.
	Increase employment and residential development along primary transit corridors	Identify land use and/or zoning changes to expand transit-oriented development (TOD) opportunities along the City's primary transit corridors. Pursue strategies to increase affordable housing in these areas.
	Increase bikeway infrastructure	Redesign transportation infrastructure to expand the City's bikeway system throughout the City, particularly in disadvantaged communities, in order to encourage safe and convenient use of bicycles, e-scooters, and other sustainable travel modes.
	Expand/improve pedestrian infrastructure citywide	Ensure safe and convenient pedestrian infrastructure is provided citywide, including uninterrupted sidewalk connections, adequate lighting and visibility, shading, and safe intersections.

Action		What It Does
	Develop an Electric Vehicle Infrastructure Master Plan	Develop an electric vehicle (EV) infrastructure plan that aligns with county-wide efforts to guide investment and policy decisions that will result in a distributed network of EV chargers.
	Update the Transportation Demand Ordinance	Update and implement a transportation demand management (TDM) ordinance that encourages alternative modes of transportation over single-occupant vehicles, including transit, vanpool/carpool, and bicycles.
	Increase density and mixing of land uses	Use the City's land use authority to increase development density and provide a mix of land uses, such that more residents and employees in the City can easily access goods, services, and entertainment via transit or active transportation modes.
	Integrate SB 743 planning with CAAP process	Use the Climate Action and Adaptation Plan process to identify local Vehicle Miles Traveled (VMT) reductions that, paired with reductions in other sectors, allows the City to achieve a GHG reduction target that is consistent with state guidance.
	Identify and implement short-term measures to reduce emissions related to oil and gas extraction in Long Beach	Identify and implement measures intended to reduce oil and gas extraction emissions in the short term, such as technological interventions, leak detection, repair inspections and energy efficiency improvements, and explore ways to increase access to information regarding these emissions.

2030 Buildings + Energy Actions



- 27% reduction in Building + Energy sector emissions by 2030 (compared to forecast)
- Achieving this reduction would require nearly all households and half of businesses to switch to very-low or zero-emissions electricity
- Total of 5 Building + Energy sector actions

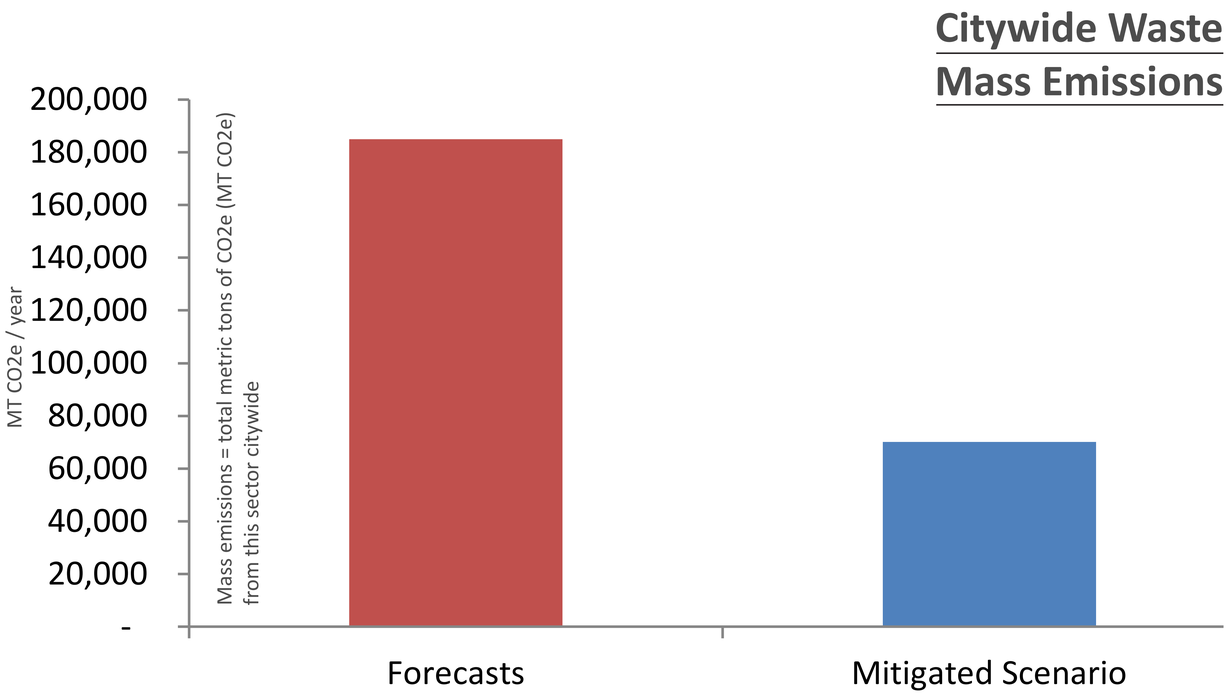
Action		What It Does
	Provide access to renewably generated electricity	Explore and pursue various options to increase the community's access to renewable electricity that exceeds the State's Renewables Portfolio Standard in the near-term electricity use contributed more than 20% of Long Beach's total community emissions in 2015. At the utility level, there are two options available to increase local use of clean electricity, either an opt-in program with Southern California Edison or by joining a CCA program.
	Develop a home energy assessment program	Develop a program that encourages homeowners and property managers to complete energy assessments in order to identify energy and cost savings opportunities, and connect them with certified contractors and financing or rebate programs.
	Provide access to energy efficiency financing, rebates, and incentives for building owners	Identify funding sources to increase energy efficiency improvements in the community's existing building stock, and develop an outreach strategy to promote opportunities to all segments of the community.
	Promote community solar and microgrids	Leverage partnerships and private developers to expand participation in community solar programs. Identify optimum locations and funding mechanisms for implementing microgrid pilot projects.
	Perform municipal energy audits	Establish a municipal building/facility energy audit program and targets to decrease annual energy use and track progress.

Key Action Spotlights

Southern California

The Clean Power Alliance (CPA) is a Community Choice Aggregation (CCA) program that allows communities to control the source and price of electricity. Once a city participates, all it s residents and businesses will be enrolled for service with the option to opt out. Customers can select from different renewable power content options. 31 communities across Southern California such as Redondo Beach, Manhattan Beach, South Pasadena, and LA County participate and so far CPA has led to 93% usage of clean electricity.

2030 Waste Sector Actions



- 62% reduction in waste sector emissions by 2030 (compared to forecast)
- Reduction in organic waste is the driver of sector reductions
- Total of 4 waste sector actions

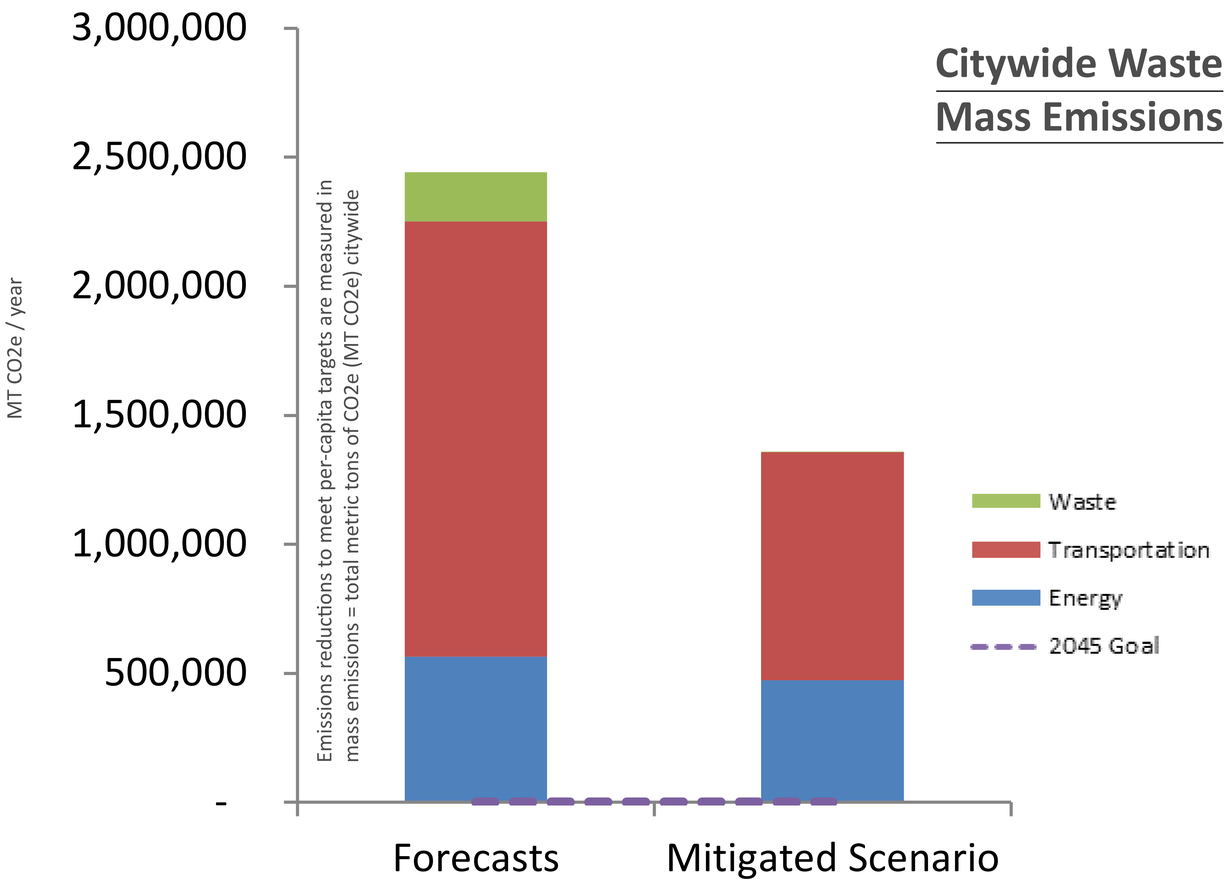
Action	What It Does
Ensure compliance with state law recycling program requirements for multi-family residential and commercial property	Adopt a mandatory commercial recycling ordinance that includes enforcement language to ensure on-site recycling collection is provided at multi-family and commercial properties and that the City is in compliance with State Law.
Develop a residential organic waste collection program	Develop a curb-side collection program to divert organic waste for composting or processing at an anaerobic digestion facility and implement a pilot food waste collection program for single-family residential homes and multi-family properties to identify barriers and solutions to broad participation.
Ensure compliance with state law organic waste diversion requirements for multi-family residential and commercial	Adopt a mandatory commercial and multi-family organic waste collection ordinance to ensure on-site organics collection is provided at applicable properties pursuant to Assembly Bill 1826.
Identify organic waste management options	Evaluate treatment options for organic waste collected in the community, including composting, mulching, and anaerobic digestion, and develop a plan to utilize available options.

Key Action Spotlights

Seattle, WA

Since 2015, residents and businesses in Seattle have been required to compost 90% or more of their food waste. Those who continue to trash large amounts of food have their garbage tagged and receive a violation notification on their bi-monthly bill (and then fines.) The program helps divert an estimated 38,000 tons of food scraps annually from landfills.

Achieving Net Carbon Neutrality in 2045



- Our 2045 aspirational goal is to reduce per capita emissions from 4.46 MTCO2e in 2030 to 0 through net carbon neutrality
- Requires reduction of ~2.4 million MTCO2e (compared to forecast)
- After maximum reductions from all 2030 CAAP actions, the City would still need to reduce ~1.4 million MTCO2e by 2045

The City has indicated its goal of achieving net carbon neutrality by 2045 in alignment with State of California goals. Although the City has not yet determined a feasible pathway for achieving this goal, it is important to be aspirational and to continue making progress and exploring new technologies and opportunities as they develop.

- What additional actions should the City take to get from 2030 to the 2045 goal?
- What would help you reduce your carbon footprint?

What should we do to put us on track to achieve net carbon neutrality in 2045?

Additional actions in the CAAP (not currently prioritized)

Action	Support
1. Increase express bus routes and dedicated bus lanes	
2. Improve transit stops/station environments	
3. Free/Reduced price transit passes for low-income and youth	
4. Expand the City's bike share program	
5. Incentivize ride-sharing, biking, and transit programs	
6. Transition Long Beach Transit to Electric Buses	
7. Promote participation in vehicle-scrapping programs	

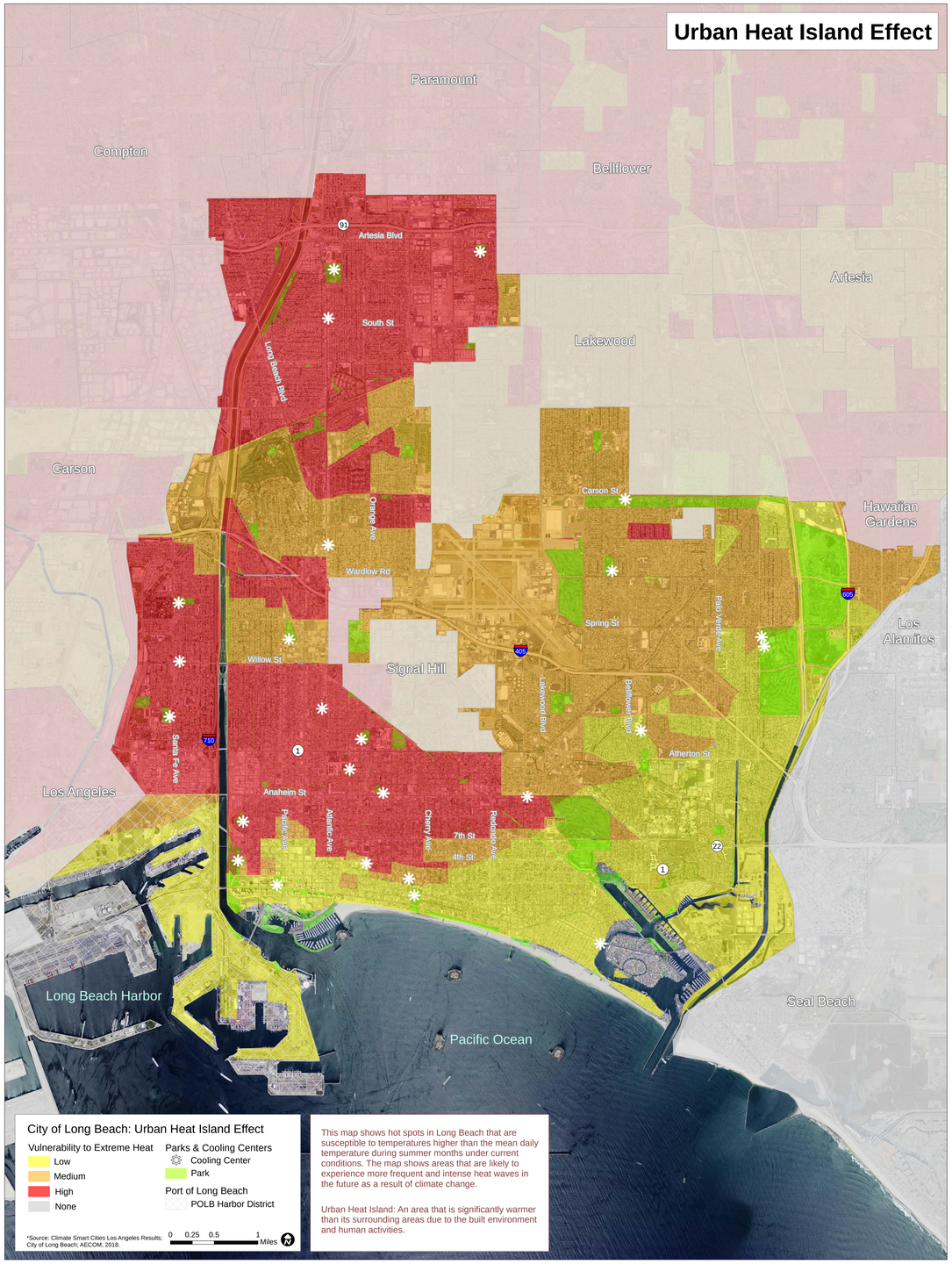
Action	Support
8. Require solar on all new buildings	
9. Require additional affordable housing in new developments near transit	
10. Explore congestion pricing	
11. Provide access to renewable natural gas	
12. Provide water-efficiency rebates and incentives	
13. Increase construction of net zero emission buildings	
14. Implement a complete ban on single use plastics	
15. Explore options to decrease and eventually phase out oil and gas extraction that takes place in Long Beach	

What are we missing?

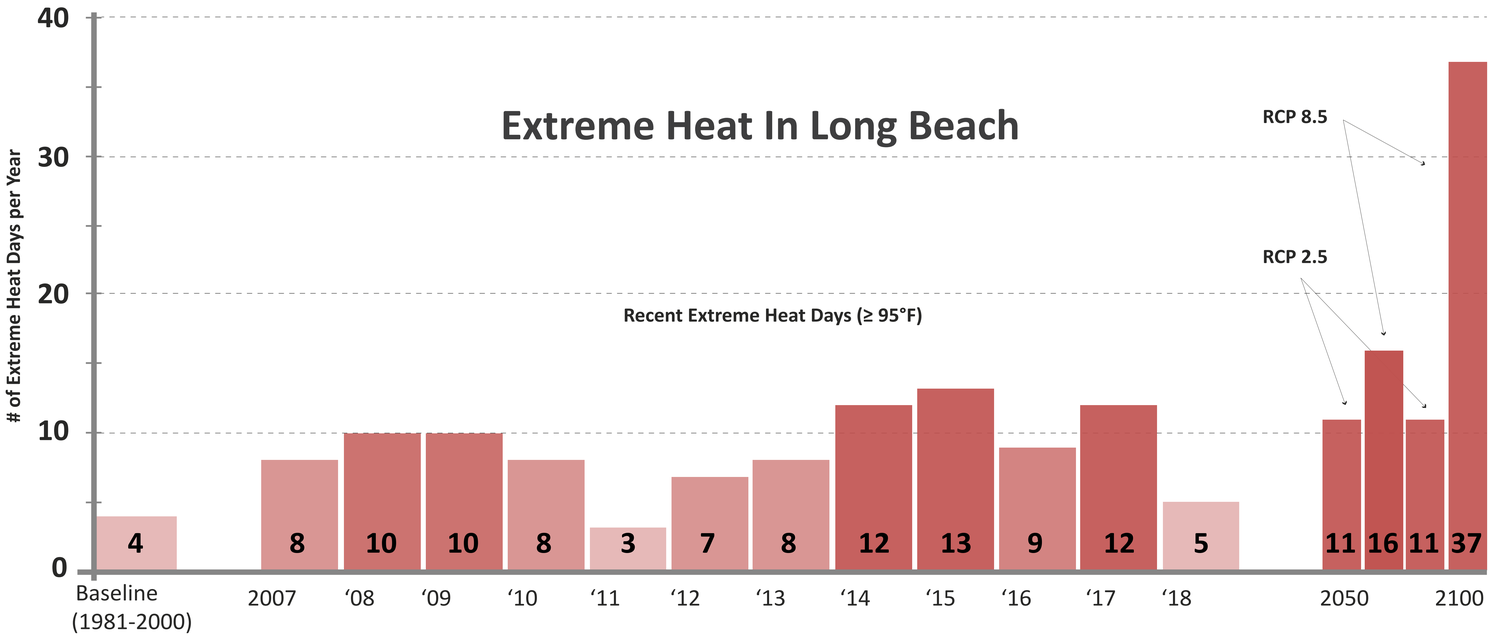
City of Long Beach Climate Action and Adaptation Plan (CAAP)

Vulnerability Assessment – Extreme Heat

- Of all climate stressors Long Beach will face, extreme heat is expected to be the greatest health threat to the largest number of Long Beach residents.
- As extreme heat gets worse, the urban heat island effect could accelerate.
- Low-income areas and communities of color in North, Central, and West Long Beach are most impacted by urban heat island effect.
- 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



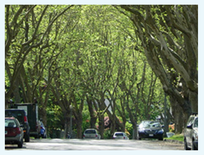
Extreme Heat Actions



(Baseline Annual & Future Projections are from Sun et al. 2015, 2007-2018 Long Beach are from www.usclimatedata.com)

- Extreme heat days in Long Beach have more than doubled, from an average of 4 extreme heat days per year from 1980-2000 to an average of 9.2 extreme heat days per year
- By 2050 = 11-16 days
- By 2100 = 11-37 days

Long Beach Adaptation Actions	What will it do and/or where else has it been done?
Increase presence of cool roofs and cool walls	*Los Angeles, CA.* In 2013 LA City passed a cool roof ordinance requiring all new homes or existing homes undergoing roof renovations to install cool roof products (including single-family and multi-family units). The LA Department of Water and Power provides cool roof rebates.
Increase presence of reflective streets, surfaces, and shade canopies	*Los Angeles, CA.* In summer 2017, the City of Los Angeles Bureau of Street Services (BSS) installed cool pavement technology on public streets for the first time in California. A thin, greyish-white coating was applied on the road surface of one city block in each of the fifteen Council Districts. This technology helps to reflect solar rays off asphalt, which typically absorbs 80 - 95% of solar rays. Initial tests estimate that cool pavement coatings can reduce the surface temperature of the asphalt road surface by approximately 10°F on a hot summer day and last for approximately seven years. BSS is currently seeking funding sources to implement a phase II pilot.
Increase public access to water	*Coachella Valley, CA.* Since 2017, advocacy groups installed 75 fill-up stations in more than 20 locations in the eastern part of Coachella Valley to increase public access to potable drinking water. Stations installed in areas without access to safe drinking water have a filtration system that helps rid water of chemicals.

Long Beach Adaptation Actions	What will it do and/or where else has it been done?
Develop mitigation plan for power outages related to extreme heat	Long Beach will partner with Southern California Edison to undertake assessment of current grid vulnerabilities related to extreme heat-caused power outages and develop plans to address those vulnerabilities.
 **Expand implementation of the Urban Forest Management Plan**	*Portland, OR.* The City of Portland partnered with Portland State University to conduct a one-year project identifying barriers, opportunities, and recommendations for growing a more equitable urban forest to inform the update and execution of its Urban Forest Management Plan. The project found that its tree canopy was not distributed evenly throughout the city and is correlated with income. Key recommendations included identifying and prioritizing areas of the city that would most benefit from tree planting.
Provide bus shelter amenities to reduce heat and sun exposure	*Phoenix, AZ.* The Bus Stop Design Guidelines for Valley Metro (serving the Phoenix metropolitan area) recommends that shelter designs and landscaping plans maximize shading for summer morning and afternoon hours.
Expand accessibility of cooling centers	*Houston, TX.* During a 2015 heat wave in the City of Houston, Houston METRO offered free public transit rides to 49 cooling centers and public air conditioned facilities.

LONG BEACH DEVELOPMENT SERVICES

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Air Quality + Drought Actions

It is projected that air quality and drought will worsen in Long Beach

Air Quality Actions selected	What will the City do?
Incentivize installation of photocatalytic roofing tiles	Support the installation of photocatalytic tiles to improve air quality as part of broader projects in disadvantaged communities designed to more holistically address GHG and air quality emissions. *(see Key Action Spotlights Box A)*
Support the development of the Long Beach Airport Sustainability Plan	The City will work with Long Beach Airport to support the development of their Sustainability Plan with a focus on reducing emissions from vehicles and equipment at the airport. Additionally, support efforts to explore the feasibility of electric-powered airplanes into its fleet.
Electrify local, small emitters	The City will support the replacement of fossil fuel-powered small engine equipment with electric-powered equipment. Did you know that a traditional leaf blower in one hour of operation emits smog-forming pollution comparable to driving about 1,100 miles, approximately the distance from Long Beach to Denver?
Support school bus electrification	The City will work with the Long Beach Unified School District to explore opportunities to transition the school bus fleet from diesel-powered to electric.
Increase monitoring of oil extraction and refining processes	Establish air monitors outside of active wells and refineries that are within LB borders. Audit survey of all methane emissions to check possible emissions coming from either active or abandoned oil wells. *(see Key Action Spotlights Box B)*

Drought Actions selected	What will the City do?
Implement additional water conservation programs	Implement additional water conservation programs to help reduce water use and demand consistent with Long Beach's Urban Water Management Plan, last updated in 2015 and updated every five years, outlines current and future actions and strategies to manage and conserve water.
Develop additional water supplies or other actions as prescribed in the Urban Water Management Plan	Develop additional local water supplies to establish a more diverse water supply portfolio that is more resilient to drought including expansion of green streets and infrastructure to capture rain and run-off, increased rainfall capture, and expansion of water recycling and reuse such as greywater and purple pipe.
Continue outreach and education related to water conservation	Continue public outreach campaigns to promote efficient water use. Households and businesses have a critical role to play in reducing water consumption. Education about choices and behaviors can go a long way to meeting citywide water conservation goals. Water conservation also has meaningful cost savings potential which will continue to be a core part of Long Beach Water's ongoing efficiency outreach and education.
Encourage urban agriculture practices that promote drought resilience	Continue to incentivize the use of drought tolerant urban agriculture practices and projects in community and home gardens. This action will provide new incentives for drought-tolerant urban agriculture practices to home and community gardens. The program development will explore incentive provisions for drought tolerant seeds and plants, rain catching and drip irrigation systems, and other water conservation equipment.

Key Action Spotlights A - Installation of photocatalytic roofing tiles

Mexico City

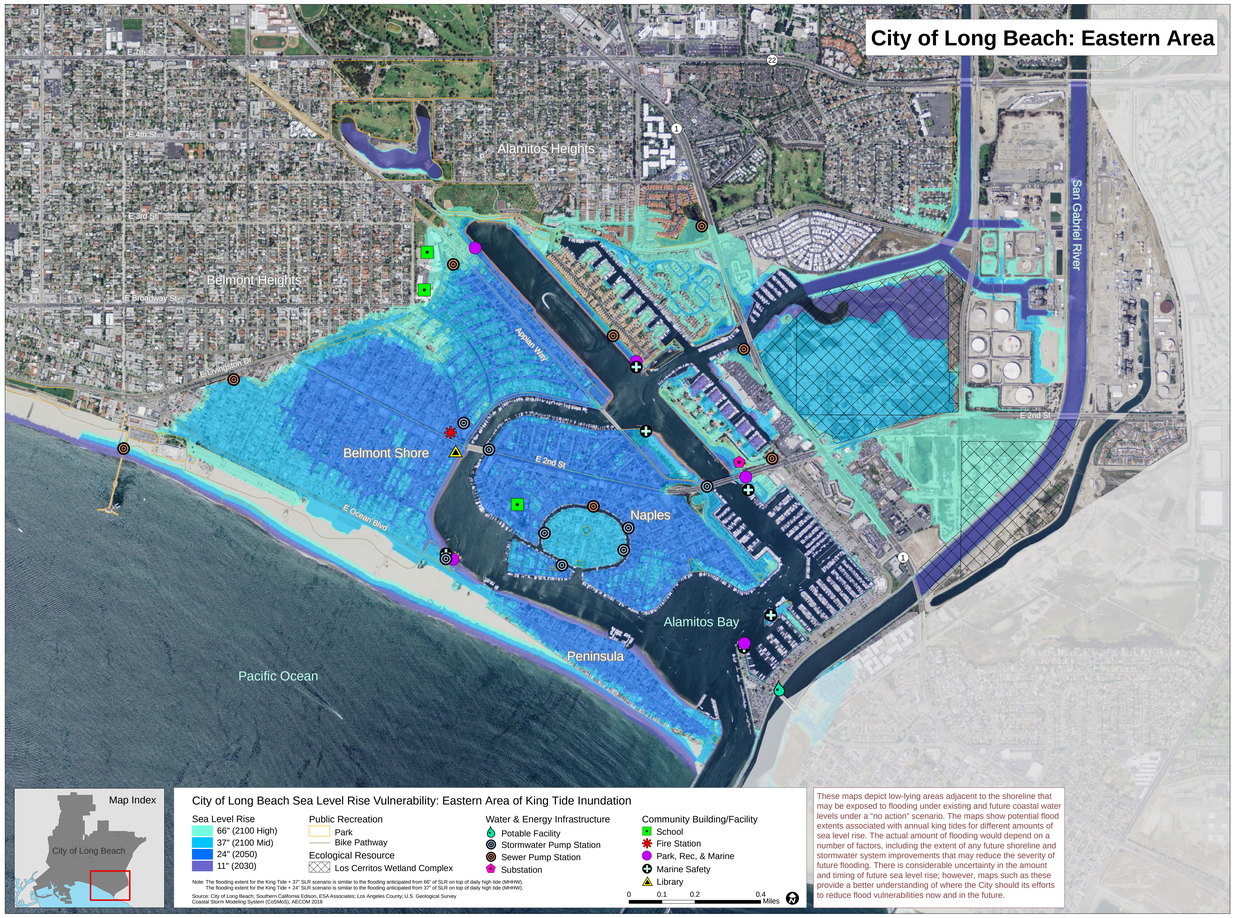
A hospital building called the Torre de Especialdades in Mexico City has a façade that is covered with special tiles coated with titanium dioxide. This pigment can act as a catalyst for chemical reactions that are activated by sunlight. The reactions convert smog into other substances such as calcium nitrate and water.

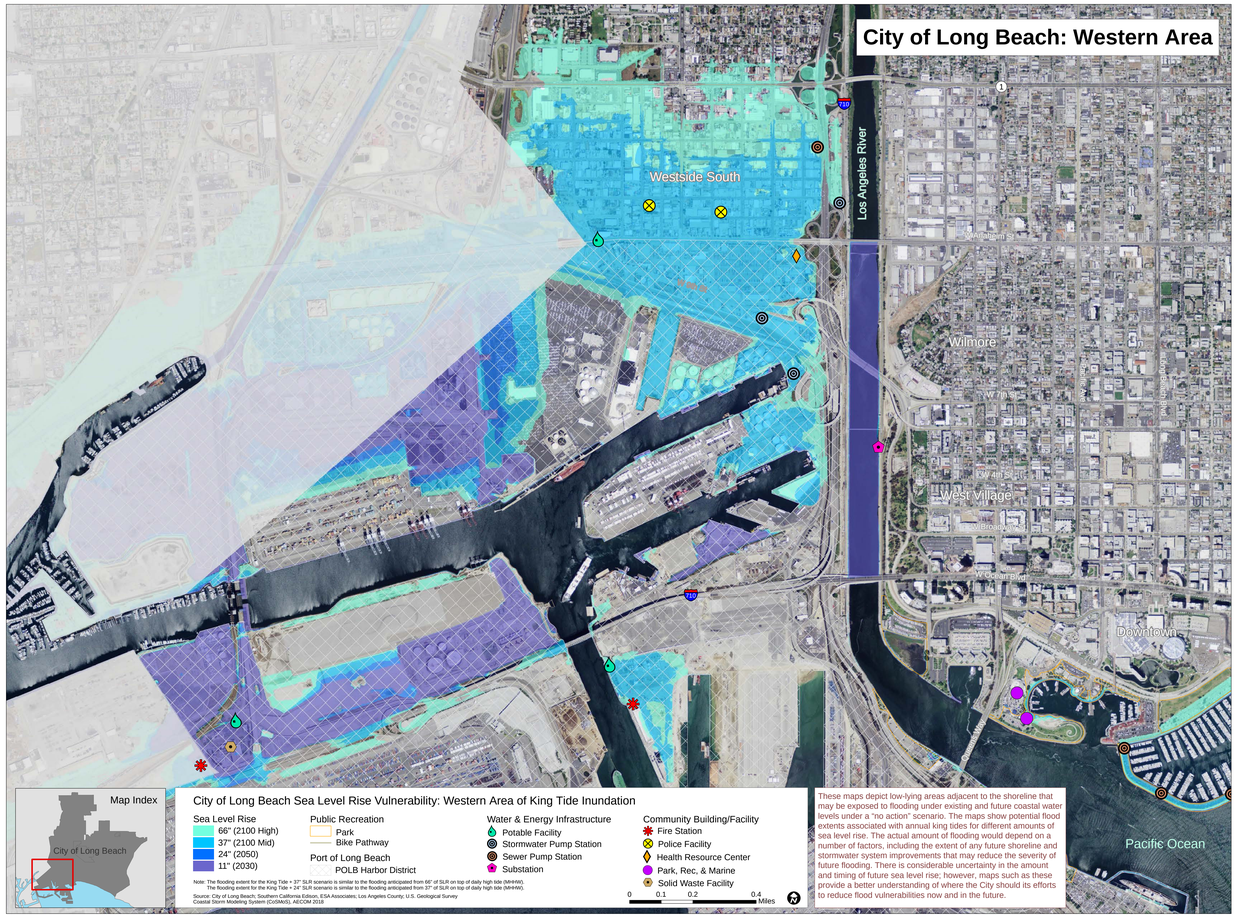
Key Action Spotlights B - Monitoring of oil extraction and refining process

Aliso Canyon, CA

After the 2015 Aliso Canyon Gas Leak, SoCalGas implemented a series of methane monitoring technologies and practices, including an infrared fence-line methane-monitoring system, around-the-clock pressure monitoring of all wells, and daily scanning of each well using sensitive infrared thermal imaging cameras that can detect leaks.

Sea Level Rise

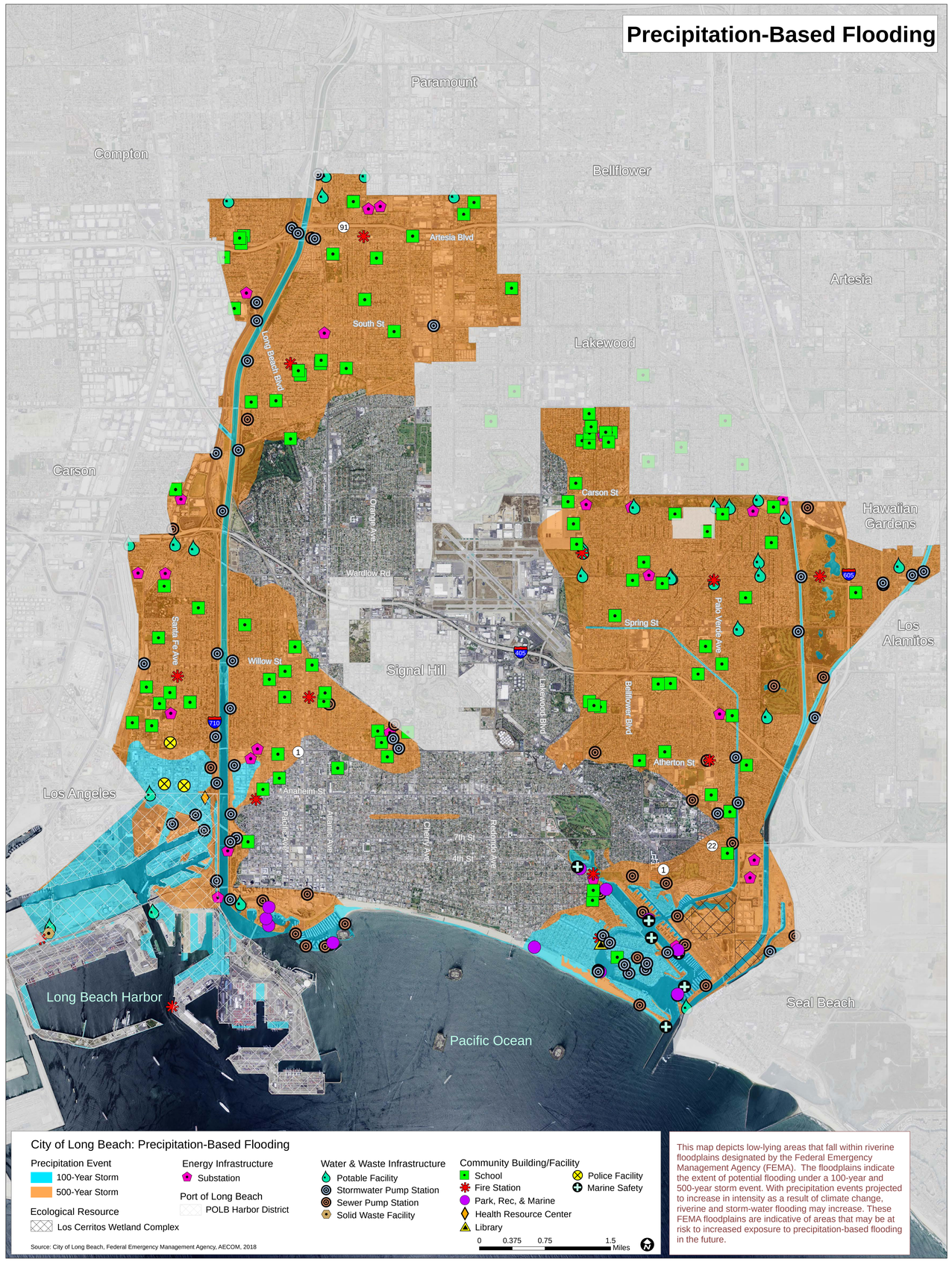




Flooding

Potential Flooding Impacts

- 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 Sea Level Rise (SLR) and a 100-year storm surge, over 22,000 Long Beach residents are at risk of exposure to flooding
- Disruptions to the transportation system could impact neighborhood connectivity including access to jobs, goods, services and healthcare
- 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
- Increased risk of displacement and loss of home due to a flood event related to precipitation based flooding property damage and disruption to businesses



Flooding Actions (Coastal + Inland)

Short (to 2030) + Medium-Term (2030-2050)

Short-Term Actions 2030	What it does
1. Establish floodplain ordinance	Establish a floodplain ordinance to limit, elevate, or provide flood-proofing standards for development in areas designated as vulnerable to flooding in order to minimize property impacts from flooding. *(see Key Action Spotlights Box A)*
2. Incorporate sea level rise language into citywide plans, policies, and regulations	Mainstream sea level rise adaptation by incorporating sea level rise impacts into relevant plans, policies, and regulations (e.g., General Plan, neighborhood plans, Local Coastal Program, design standards for capital projects).
3. Establish a flood impacts monitoring program	Streamline the collection and analysis of flood impact data by collecting photo and video documentation during and after storms or other flooding events so the City may compare SLR and flood projections with realities on the ground. This could be done in partnership with local schools including CSULB, LBCC and/or LBUSD.
4. Incorporate adaptation into City lease negotiations	Include requirements and incentives for implementing adaptation strategies into new and renewed leases on City-owned land.
5. Update the City's existing Stormwater Management Plan	Update the City's existing Stormwater Management Plan to account for flood risks associated with climate change and develop a funding/implementation plan for fully funding storm drain and pump station improvements.
6. Conduct citywide beach stabilization study	Conduct a citywide study to assess the feasibility of a combined nourishment and sand retention program. Study will estimate sand volumes required to keep pace with Sea Level Rise (SLR), costs, and potential sources of sand.

Short-Term Actions 2030	What it does
7. Conduct studies of combined riverine/coastal flooding and increased precipitation impacts on watershed flooding	Carry out further studies to understand the potential influence of sea level rise and increased precipitation on flood risk at the riverine/coastal interface and along river channels.
8. Restore dunes	Convert seasonal storm berms to year-round dunes through active dune restoration. Discontinue beach grooming and plant native dune species to allow natural vegetation to stabilize dunes and hold sand.
9. Inventory and flood-proof vulnerable sewer pump stations	Assess potential for flood damage at all sewer pump stations, and for pump stations identified as vulnerable to flooding, apply flood-proofing techniques and add emergency generators.

Medium-Term Actions 2030-2050	What it does
10. Investigate sea level rise adaptation funding mechanisms and strategies	Explore a special flood district or alternative funding strategies to help pay for improvements in flood prone areas.
11. Relocate/elevate critical infrastructure	Raise or relocate critical infrastructure to be outside the sea level rise vulnerability zone. *(see Key Action Spotlights Box B)*
12. Elevate riverine levees (as identified by FLD-07)	Based on results of riverine flood study (RIV-02), elevate channel banks and levees to provide enhanced flood protection.

Key Action Spotlights A - Establish Floodplain Ordinance

Houston, TX

After Hurricane Harvey in 2017, the Houston City Council voted to update the City's Floodplain Ordinance to require new and substantial improvements to buildings within the 500-year floodplain to be built two feet above FEMA 500-year floodplain elevation.

Key Action Spotlights B - Relocate/elevate critical infrastructure

Singapore

Nicoll Drive, which hugs the eastern shoreline, is being raised in anticipation of rising sea levels triggered by global warming. The road raising project, which elevates the 1 kilometer, two-lane dual carriage by up to 0.8 meters, is the first Singapore is undertaking to brace itself for the effects of climate change.

Flooding Actions (Coastal + Inland)

Long-Term (2050-2100)

Long -Term Actions 2050 - 2100 *Physical (see map on right)*		
13.	**Continue to nourish beaches**	Based on findings from beach stabilization study, beaches identified as suitable could be nourished so that they are elevated and preserved
14.	**Construct living shoreline/berm**	The shoreline could be elevated to tie in with the landscape and park facilities to prevent flooding of inland areas while continuing to provide beach access
15.	**Elevate/extend curb**	The curb could be elevated and extended to eliminate gaps that could become flood pathways
16.	**Elevate streets/pathways**	Elevate waterfront streets and paths to provide protected transportation routes and flood protection for infrastructure behind the road/path
17.	**Retrofit/extend walls**	The existing wall may currently provide some flood protection, but it is segmented and not designed for flood protection. It could be retrofitted or rebuilt to provide adequate protection against Sea Level Rise (SLR)
18.	**Retreat / realign parking lots**	Relocate, reduce size, or realign parking lots as beach narrows
19.	**Extend/upgrade existing seawalls**	Sheet pile seawalls could be expanded to other areas of the Naples shoreline that are not being addressed by the current upgrade
Long -Term Actions 2050 - 2100 *Informational*		**What it does**
20.	**Investigate feasibility of managed retreat**	Explore managed retreat options for vulnerable shoreline infrastructure through land acquisition and relocation programs
21.	**Evaluate feasibility of storm surge barrier at Alamitos Bay**	Conduct a feasibility study to evaluate construction of a storm surge / tide gate barrier at entrance to Alamitos Bay

City Of Long Beach Climate Action And Adaptation Plan

Pledge Board

In the spirit of staying rooted and thriving in a vibrant city, the Climate Action and Adaptation Plan is also an invitation for everyone who lives, works or plays in Long Beach to work together in making Long Beach a low-carbon and climate-resilient city.

What CAAP actions do you support that will achieve goals

What steps will you personally take to help achieve these goals?