



Climate Action & Adaptation Plan

City Council Study Session

October 20, 2020

What is the Climate Action & Adaptation Plan (CAAP)?

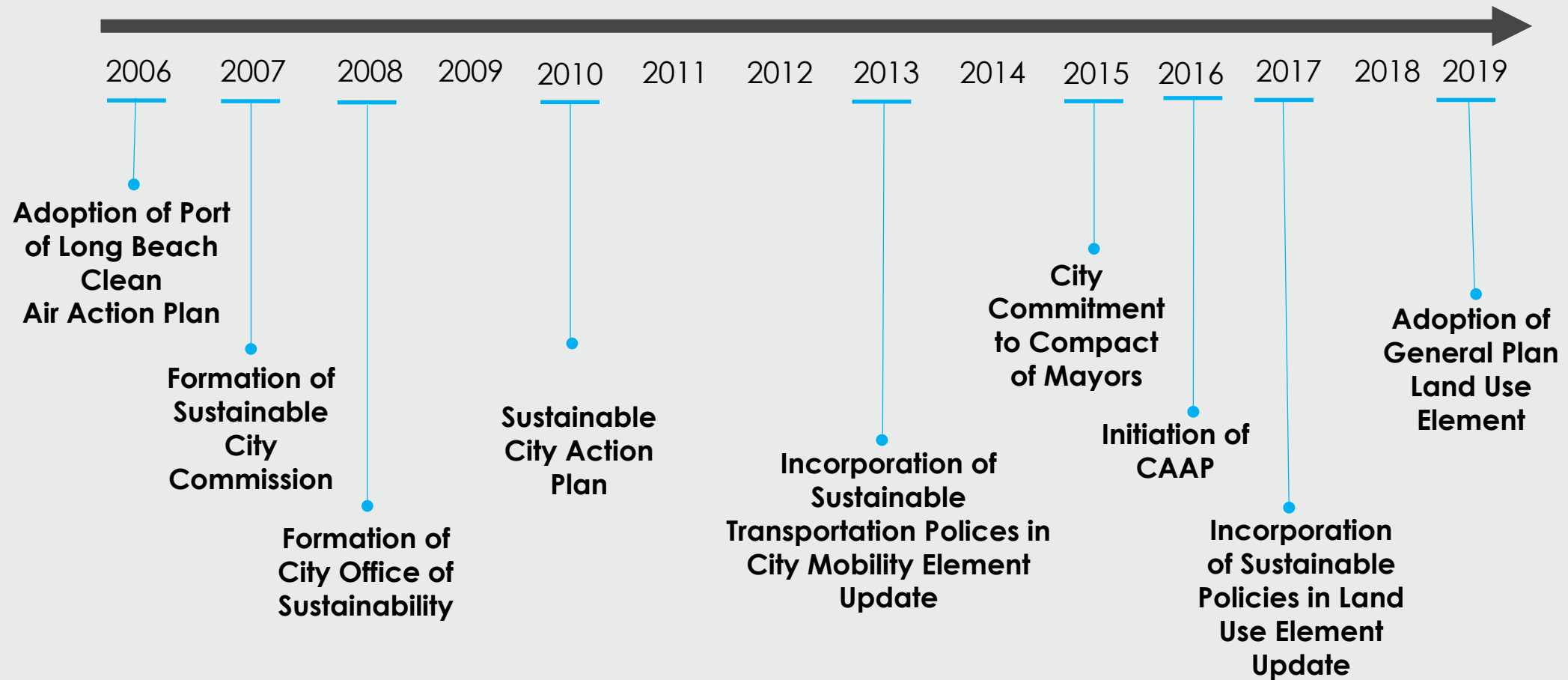
A plan to:

- Reduce communitywide greenhouse gas emissions (GHG), while preparing for the impacts of climate change
- Improve public health, foster economic opportunity, & advance social equity
- Meet policy commitments & state GHG reduction mandates

How?

- Establish a framework for creating or updating policies, programs, practices, and incentives for Long Beach to reduce the City's GHG footprint
- Ensure the community and physical assets are better protected from the impacts of climate change

Long Beach Sustainability Initiatives Timeline

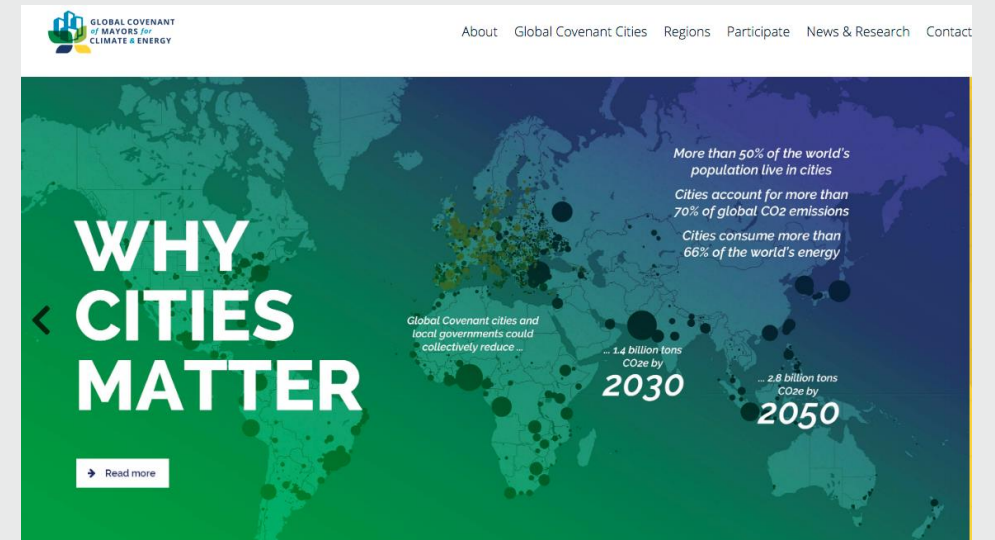


Why do we need a CAAP?

Target Year	State Target	Corresponding Legislation	City Status
2020	1990 GHG levels by 2020	AB 32, Global Warming Solutions Act (2006)	California met this target Statewide
2030	40% below 1990 levels by 2030	SB 32, Global Warming Solutions Act (2006)	The CAAP is a plan for Long Beach to meet this target by 2030
2045	Carbon neutrality by 2045	Executive Order B-55-18 of 2018	Aspirational for Long Beach
2050	80% below 1990 levels by 2050	Executive Order S-3-05 of 2005	CAAP's plan horizon is to 2030

Other Relevant Legislation

- SB 375 (Sustainable Communities)
- AB 691 (Sea Level Rise)
- SB 1000 (Environmental Justice in Local Land Use Planning)
- SB 379 (Climate Adaptation in Safety Elements)
- SB 100 (Carbon-free Electricity by 2045)



CAAP Council Actions

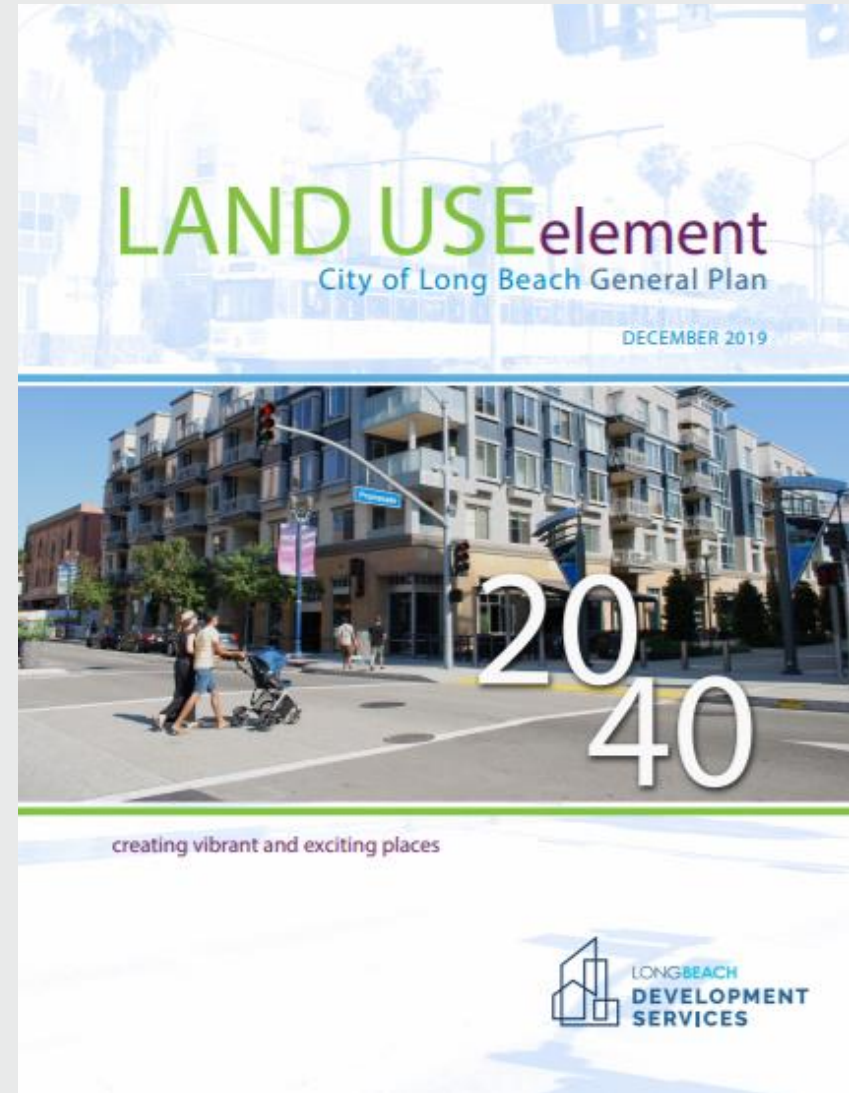
CAAP is a plan to reach the GHG emissions reduction target by 2030

- City Council directed staff to prepare the CAAP – December 2016
- City Council Study Session update – March 19, 2019
 - Established a carbon neutrality goal by 2045
- Draft Plan released – June 2019
- Evaluation of GHG reduction pathways – ongoing

Why do we need a CAAP?

CAAP is a mitigation measure of the General Plan Land Use Element (LUE)

- The General Plan Land Use Element (LUE) was adopted in December 2019
- GHG emissions associated with implementation of the LUE (e.g., citywide vehicle trips, electricity usage)
- **City shall adopt a CAAP within approximately 36 months of adoption of the LUE & implement CAAP reduction measures (MM GHG-1)**



Why do we need a CAAP?

City leadership needed for city-scale mitigation, climate adaptation, & equity beyond what could be achieved by State emissions reduction efforts alone



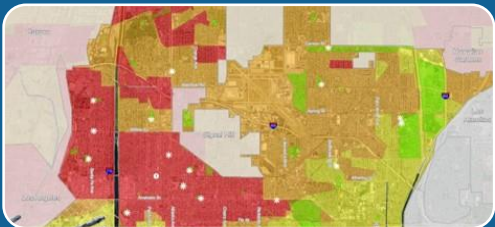
Mitigation

- Implementation occurs at both city and state level (siting EV charging stations and updating building codes & zoning to incentivize electrified buildings, for example, require local leadership)
- CAAP identifies local GHG reduction measures for implementation



Adaptation

- State emissions reduction target does not prepare Long Beach for the impacts of climate change that are happening today
- CAAP helps increase resilience for current & future threats (extreme heat, poor air quality, sea level rise, etc.)



Equity

- State emissions reduction targets do not ensure that climate issues are equitably addressed
- CAAP helps address environmental justice & can help steer climate finance opportunities to communities most impacted by climate change

CAAP Working Groups

Scientific Working Group

13 subject matter experts from UCLA, SCAQMD, RAND, Aquarium of the Pacific, CSULB, and LBCC provided input on project methodology and local data

Business Working Group

30+ global, regional, and local businesses across disciplines including architecture, engineering, utilities, sustainability, etc. provided input on climate-related business concerns

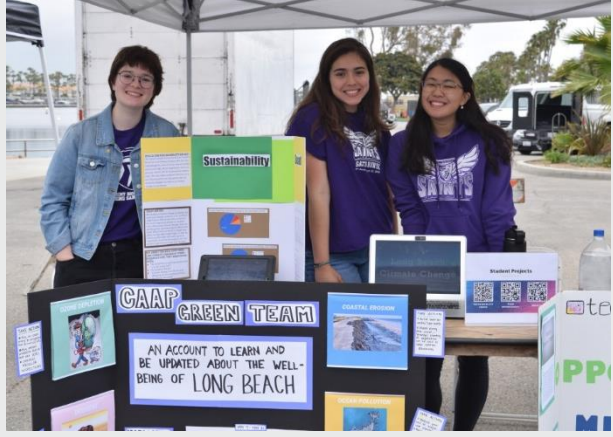
Community Working Group

30+ community-based organizations provided input on the public engagement approach and climate-related concerns



CAAP Community Outreach (June 2018 – present)

# of Estimated Attendees	9,960
# of Sign-ins	1,392
# of General Tabling Events	24
# of Presentations	27
# Hosted Events	10



Interdepartmental Coordination

17 departments surveyed

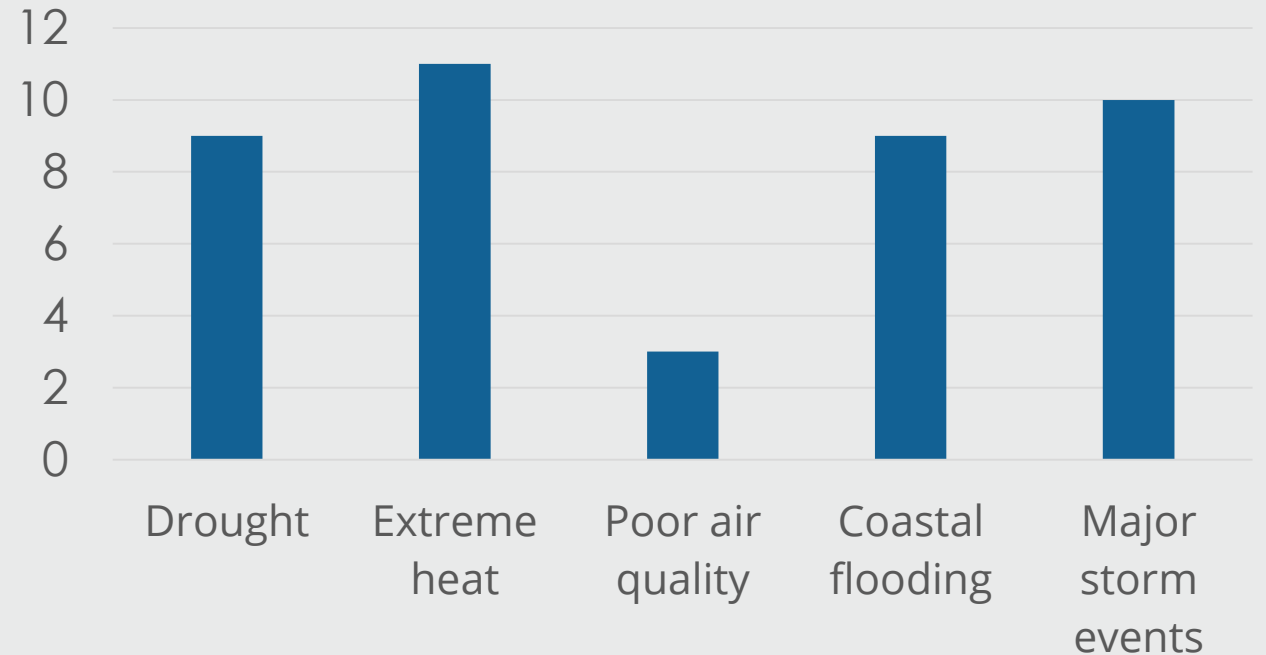
100% experienced climate impact to infrastructure assets or core services

88% are engaging in GHG emission reducing actions

53% are engaging in adaptive capacity actions

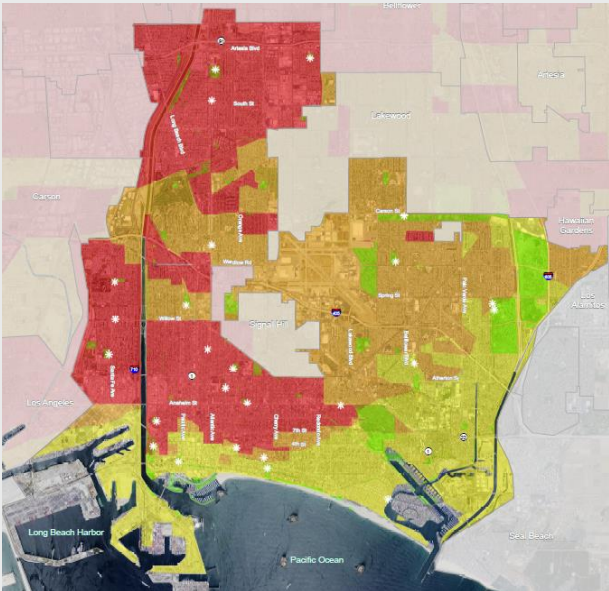
Top factors inhibiting departments from planning for climate change impacts are **data gaps** and **cross-departmental coordination**

Number of City Departments Affected by Exposure to Climate & Environmental Hazards

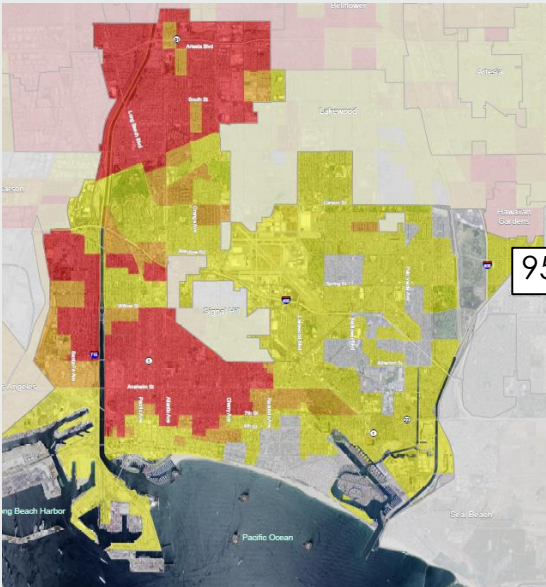


Long Beach Context

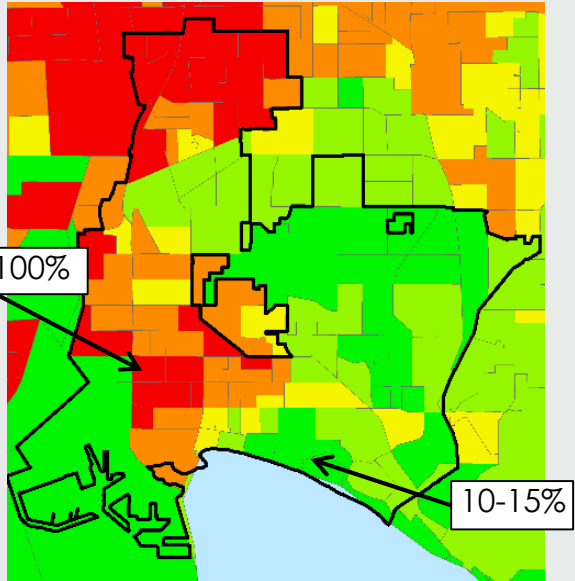
Extreme Heat Vulnerability



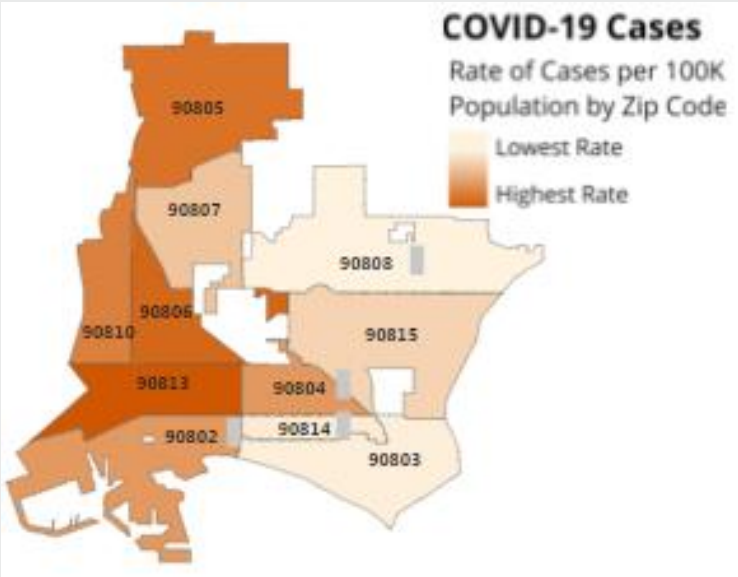
Social Vulnerability



CalEnviroScreen 3.0



COVID-19 Cases



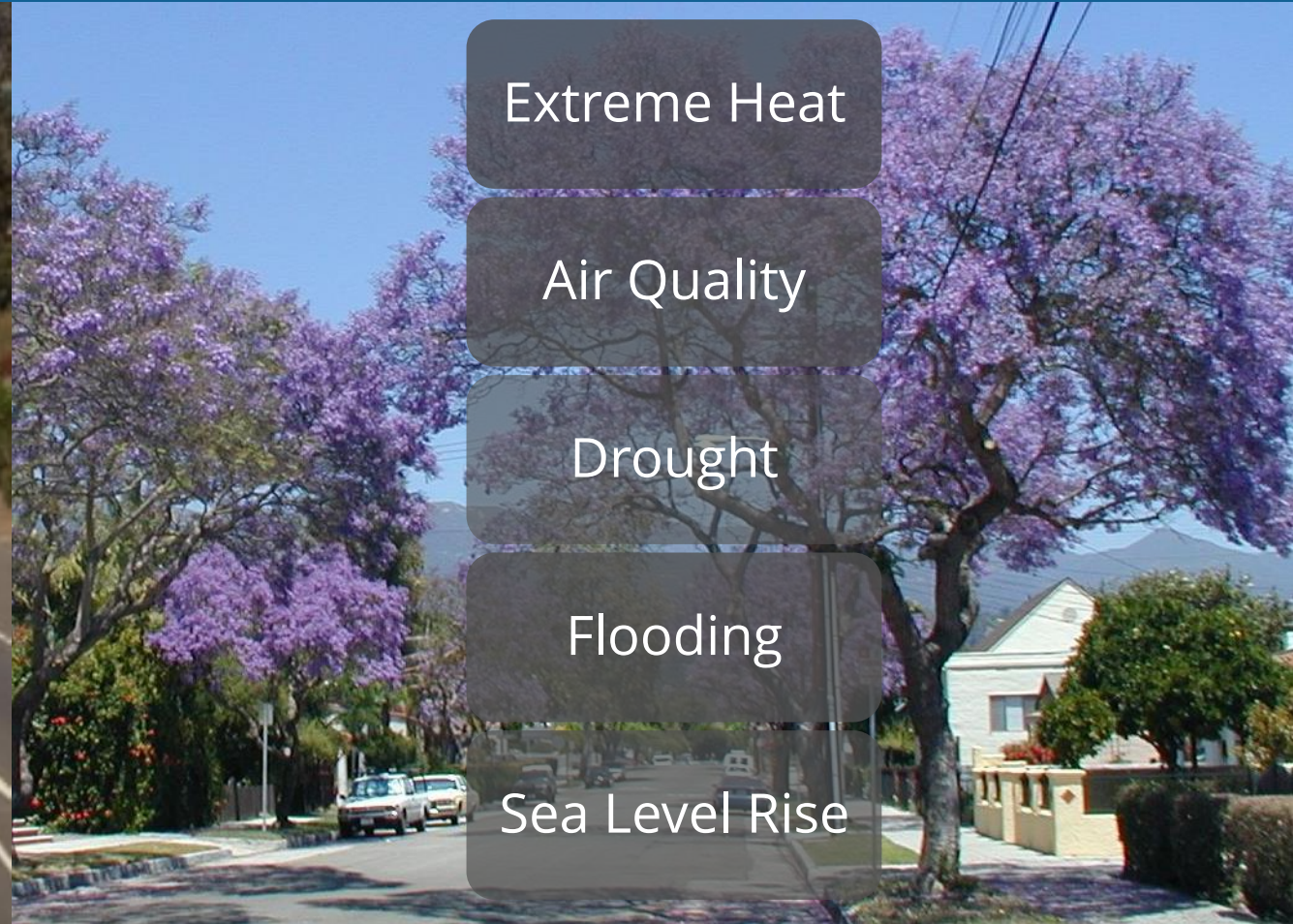
Source: Long Beach Climate Change Vulnerability Assessment, 2018.

Source: Long Beach COVID-19 Digital Dashboard, 10/16/2020

Mitigation



Adaptation



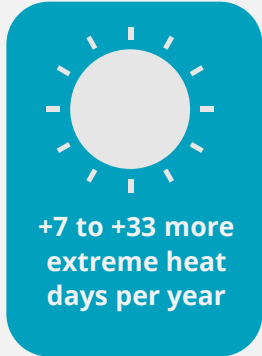
EQUITY STRATEGY: Prioritize the enhancement and expansion of urban forest cover in neighborhoods most vulnerable to extreme heat, poor air quality, and are lacking in green space.

Long Beach Climate Impacts



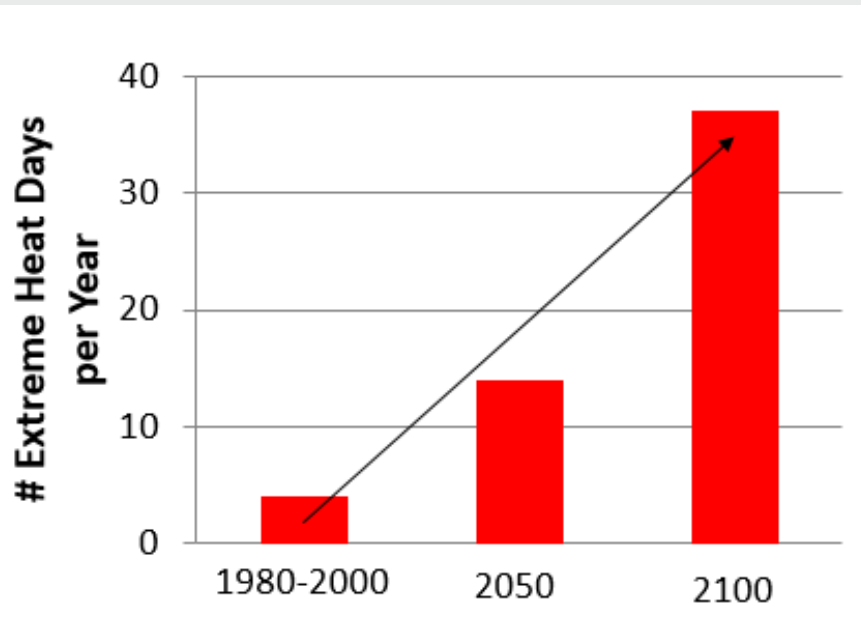
AECOM 2018. Long Beach Climate Change Vulnerability Assessment.
longbeach.gov/lbds/planning/caap/

Extreme Heat



MORE FREQUENT AND INTENSE HEAT WAVES

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



- **Approximately 275,000 residents live within extreme heat vulnerability zones (Census 2010, Climate Smart Cities)**
- Heat waves will occur more frequently, be more intense, & longer lasting
- Increased risk of heat, cardiovascular, & respiratory-related mortality, increased hospital admission & emergency room visits
- Vulnerable populations include: children, elderly, people with respiratory diseases, those who spend a lot of time outdoors
- Environmental factors influence vulnerability including neighborhoods with high levels of impervious surfaces and limited green space, & housing units that lack air conditioning or access to a vehicle to travel to cooler areas

Public transit resumes in Long Beach after 3 day power outage



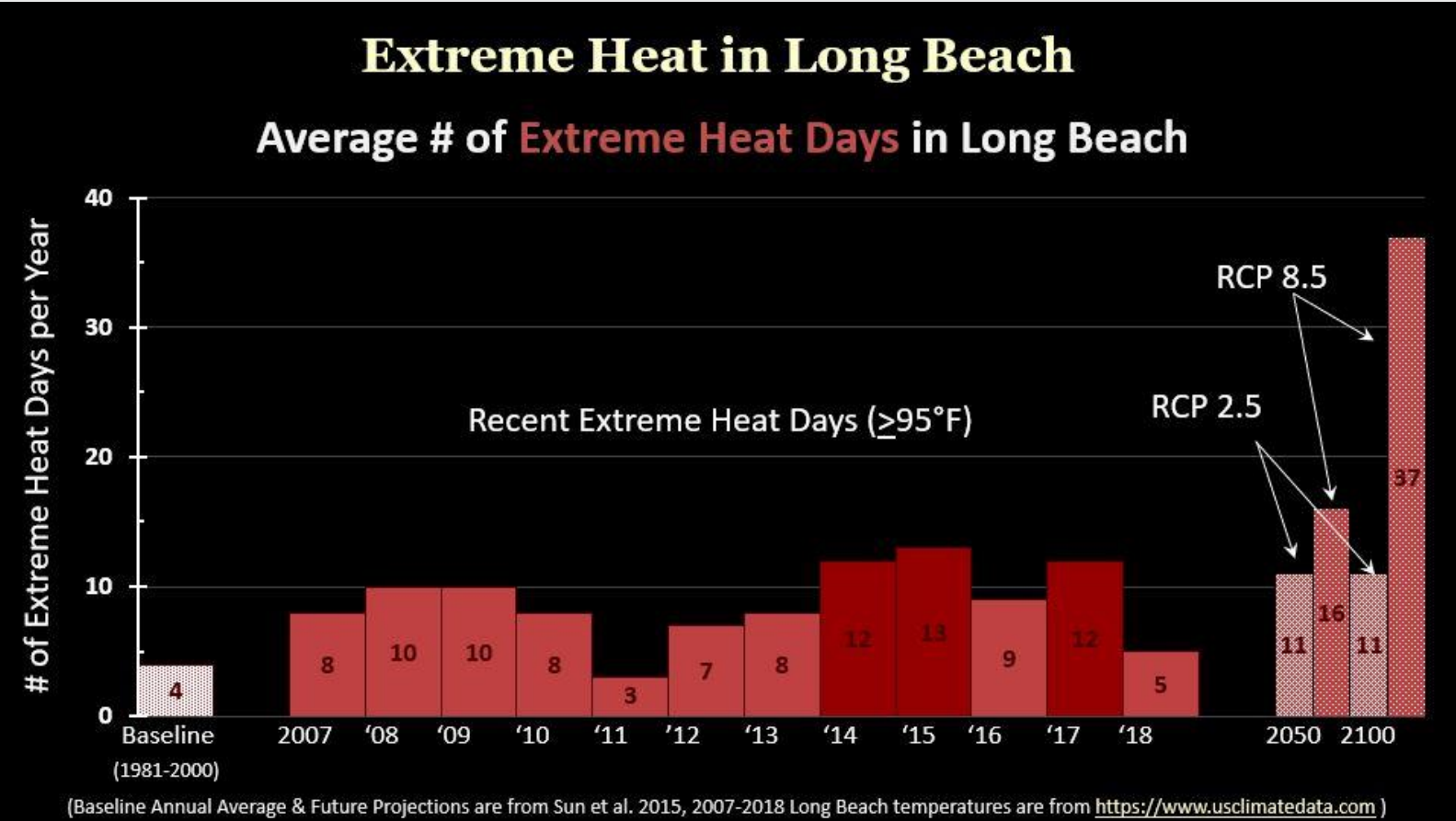
A crew worker places a manhole cover back on the street on Saturday, July 18, 2015. (KABC)

By ABC7.com staff

LONG BEACH, Calif. (KABC) -- Power was restored to more than 90 percent of downtown Long Beach Saturday morning after a series of underground electrical vault fires caused a widespread outage.

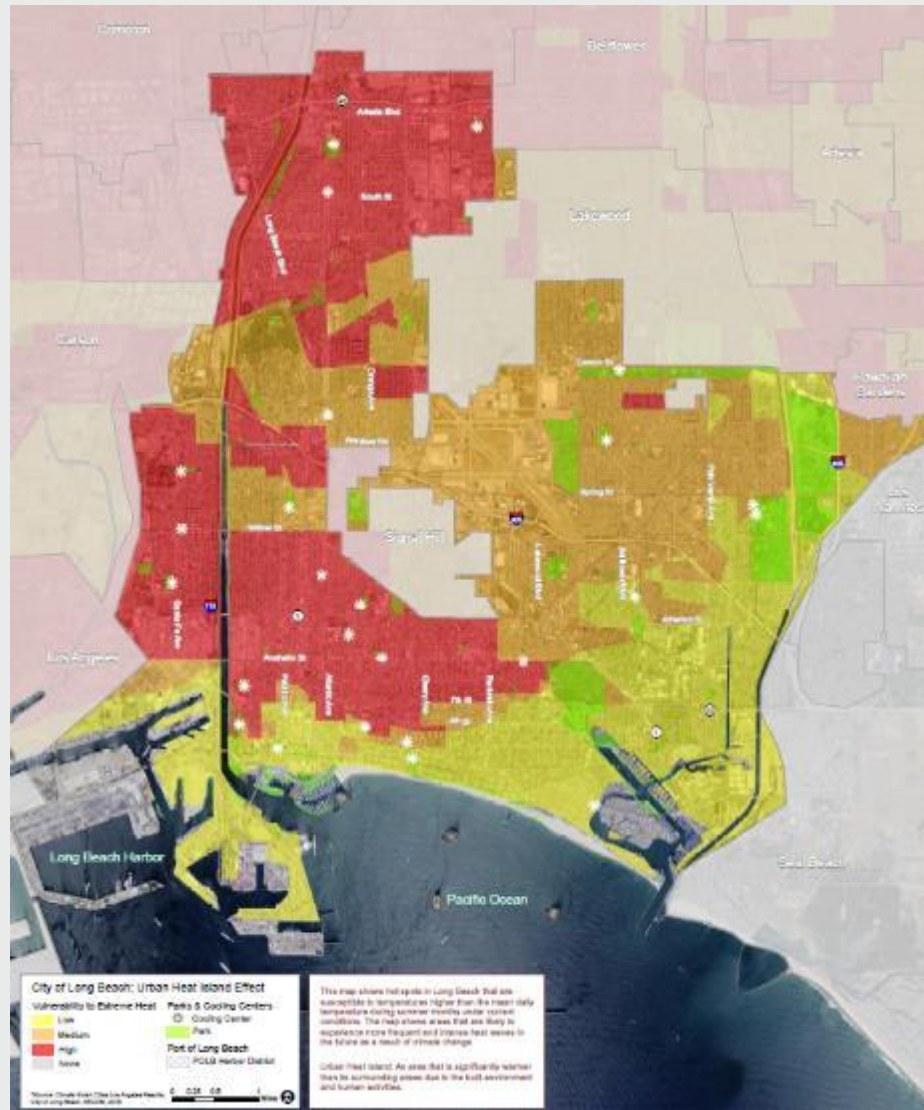
The restored electricity allowed Long Beach Transit's transit and visitor information center to reopen, but customers should expect some minor delays due to street closures.

Less than 200 people are still without power, according to Southern California Edison. An SEC spokesman said about 200 customers were without power Friday morning.

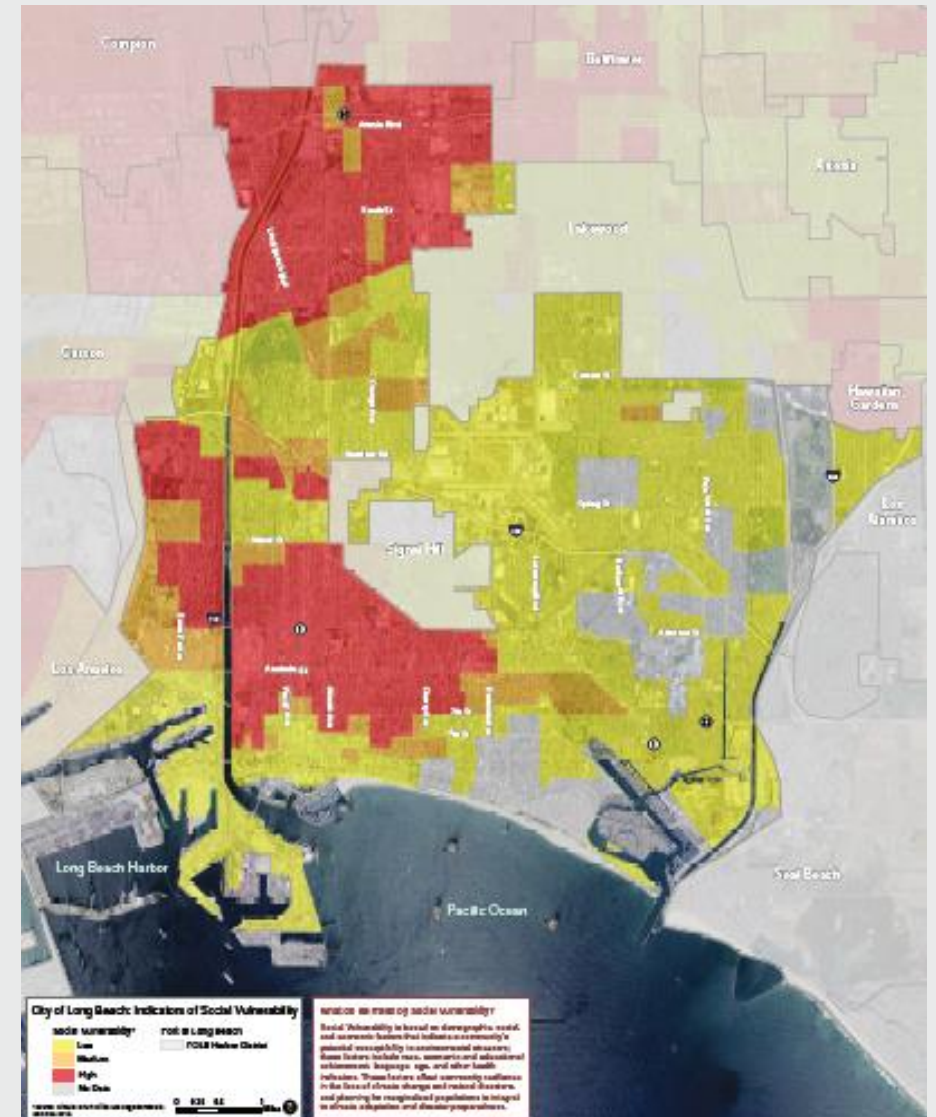


J Lentz, Aquarium of the Pacific. Presentation on 3/30/19

Extreme Heat



Social Vulnerability





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.

Smoke, ash from wildfires descend on Long Beach; raises air quality hazards

Sebastian Echeverry

Long Beach residents awoke to gray skies and a fiery red sun Thursday morning as smoke and ash from wildfires raging across Southern California floated above the city causing unsafe air quality.

Two major fires, the Bobcat Fire burning north of Azusa in the Angeles National Forest and the El Dorado Fire burning in the San Bernardino Mountains near Yucaipa, are causing unhealthy levels of air quality, Long Beach health officials said.

During a press conference Thursday, Long Beach Health Officer Anissa Davis urged residents to avoid staying outdoors and to keep windows and doors closed.

"Wildfires are producing heavy smoke and ash," she said. "Take caution and avoid activities in areas where you can see and smell smoke."



L.A. coronavirus clean air streak has already come to an end. Here's why



Light traffic on the 110 freeway in downtown Los Angeles in March. (Jay L. Clendenin / Los Angeles Times)

By TONY BARBOZA | STAFF WRITER
APRIL 28, 2020 | 10:30 AM

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A look at California's November ballot propositions

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The Times Publishes Voter Guide and Election Resources as Early Voting Begins

- Despite air quality improvements in recent decades, higher temperatures will increase air pollution formation
- Ozone concentrations increase when maximum daytime temperatures increase
- Even with further air pollution reduction efforts, the number of days conducive to ozone formation in the L.A. region could increase by 25-75% by end-of-century due to warming*

*Union of Concerned Scientists, 2008. Our Changing Climate.



LONG BEACH WATER SOURCES

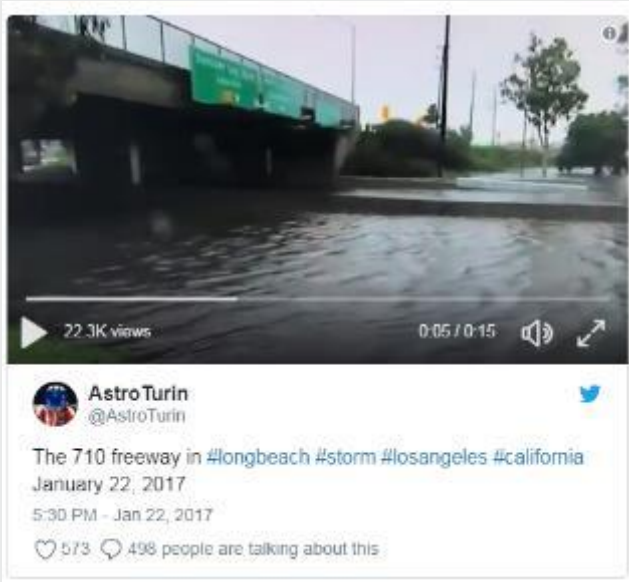
- 60% from local groundwater supplies
 - 25% imported from Colorado River
 - 15% imported from Northern California Bay- Delta
- Overall regional drying trend with longer and more frequent droughts
 - Long Beach is within a semi-arid climatic region and drought is driven by precipitation and temperature patterns
 - Higher temperatures leading to higher water demand
 - Reduced snowpack and increased intensity of runoff events in watersheds that supply water to Long Beach

Flooding & Sea Level Rise



3 SOURCES OF FLOODING:

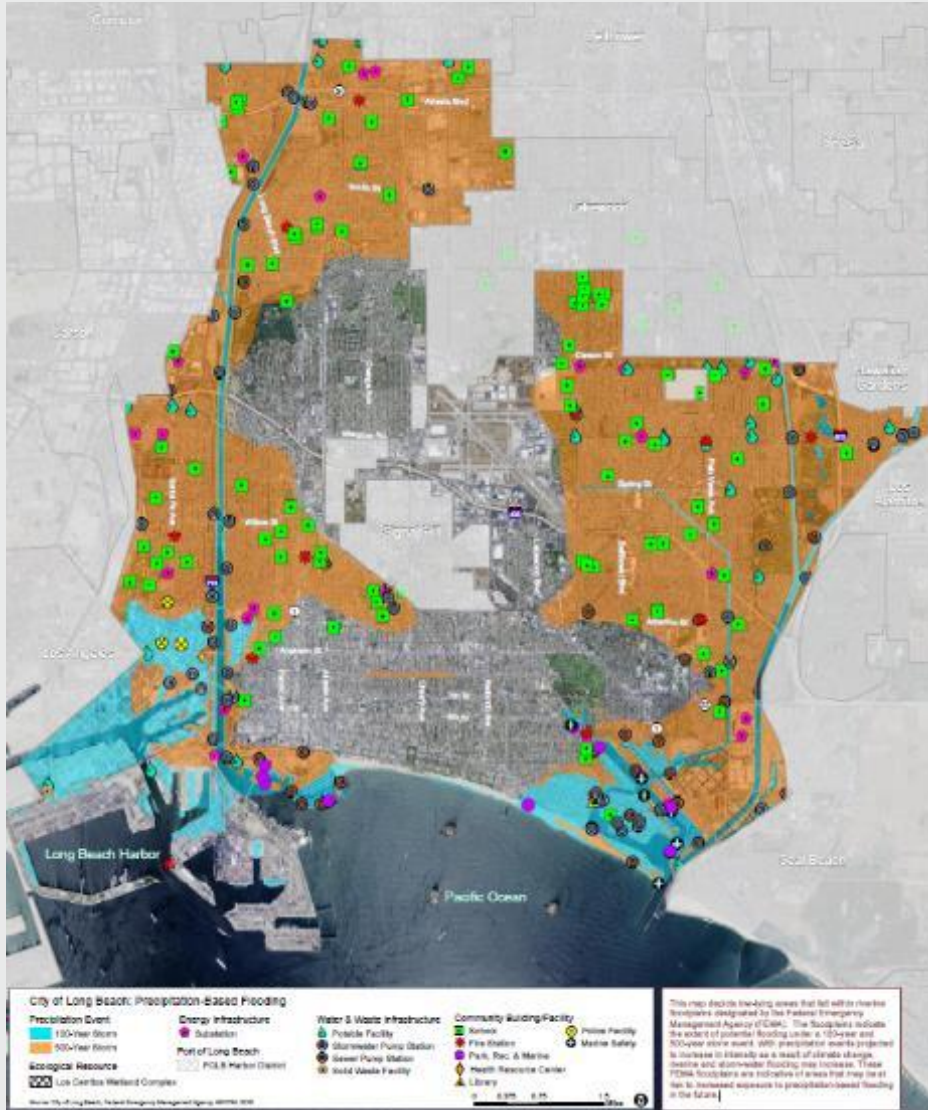
- Riverine flooding
- Urban flooding
- Sea level rise & coastal storms




- **Over 22,000 residents currently at risk of exposure to flooding in 100-year storm surge***
- Flooding events may contribute to injury, death, displacement, mental health burden
- Sewage overflow could result in water-borne illness following a flood event
- Damage to public infrastructure, city facilities, businesses, & homes
- Disruptions to the transportation system could impact neighborhood connectivity including access to jobs, goods, services and healthcare

*Aquarium of the Pacific 2015. City of Long Beach Climate Resiliency Assessment Report.

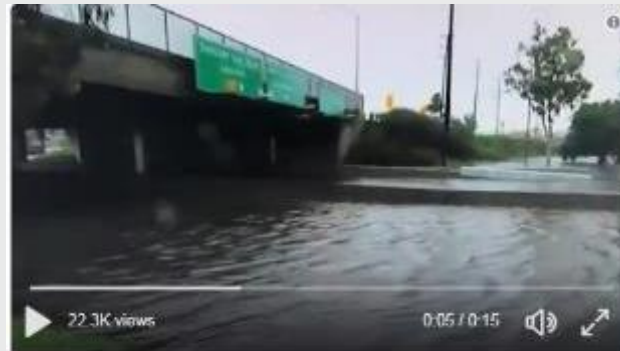
Precipitation-based Flooding



 **LBPD North Division**
(2) LBPDNorth

One of many rescues today found by a LB Sergeant & rescued by LB Fire @lbtd personnel. Passenger was in a wheelchair
10:14 PM - Jan 22, 2017

42 22 people are talking about this

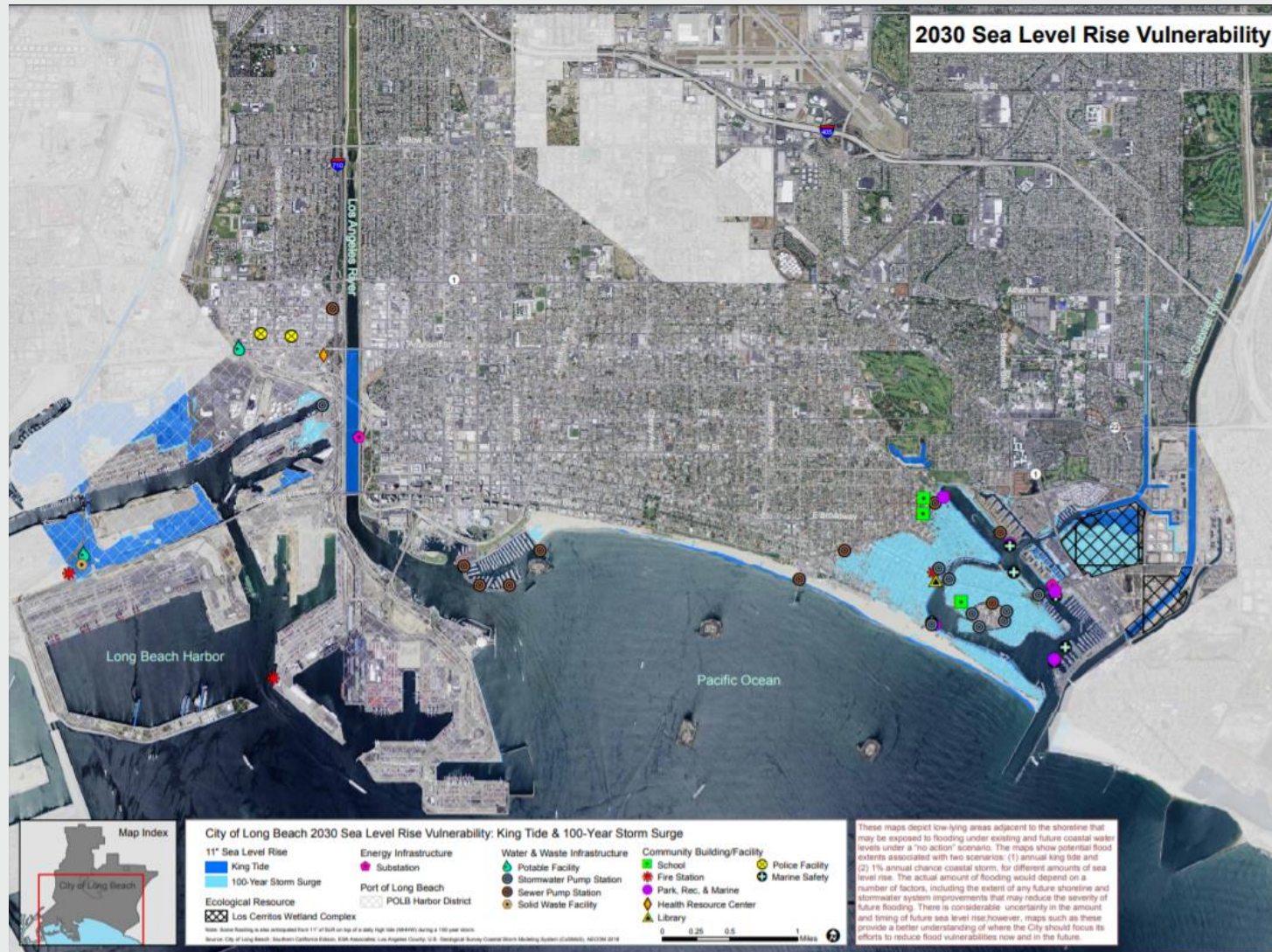


 AstroTurin
@AstroTurin

The 710 freeway in #longbeach #storm #losangeles #california
January 22, 2017

5:30 PM - Jan 22, 2017

Sea Level Rise Projection 2030



King Tide Flooding



AECOM 2018. Climate Stressors Review.
longbeach.gov/lbds/planning/caap/

Sea Level Rise Projections



Downtown Area Sea Level Rise Projections



Adaptation – Draft Flooding & Sea Level Rise Actions

Short-term (to 2030)

Objectives	Action Name	#
Governance		
City plans and policies are forward looking and ensure projects and investments account for projected sea level and flooding impacts	Update the floodplain ordinance	FLD-1
	Incorporate sea level rise language into citywide plans, policies & regulations	FLD-2
	Establish a flood impacts monitoring program	FLD-3
	Incorporate adaptation into City lease negotiations	FLD-4
	Update the City's existing Stormwater Management Plan	FLD-5

Adaptation – Draft Flooding & Sea Level Rise Actions

Short-term (to 2030)

Objective	Action Name	#
Informational		
Clear and sufficient information is on hand to identify and prioritize near-term adaptation needs and best practices	Conduct citywide beach stabilization study	FLD-6
	Review and conduct studies of combined riverine/coastal flooding and increased severity of rainfall events on watershed flooding	FLD-7
Physical/Structural		
Adaptation strategies are implemented to protect vulnerable shoreline areas and wastewater infrastructure	Enhance dunes	FLD-8
	Inventory and flood-proof vulnerable sewer pump stations	FLD-9

Adaptation – Draft Flooding & Sea Level Rise Actions

Medium-term (2030 - 2050)

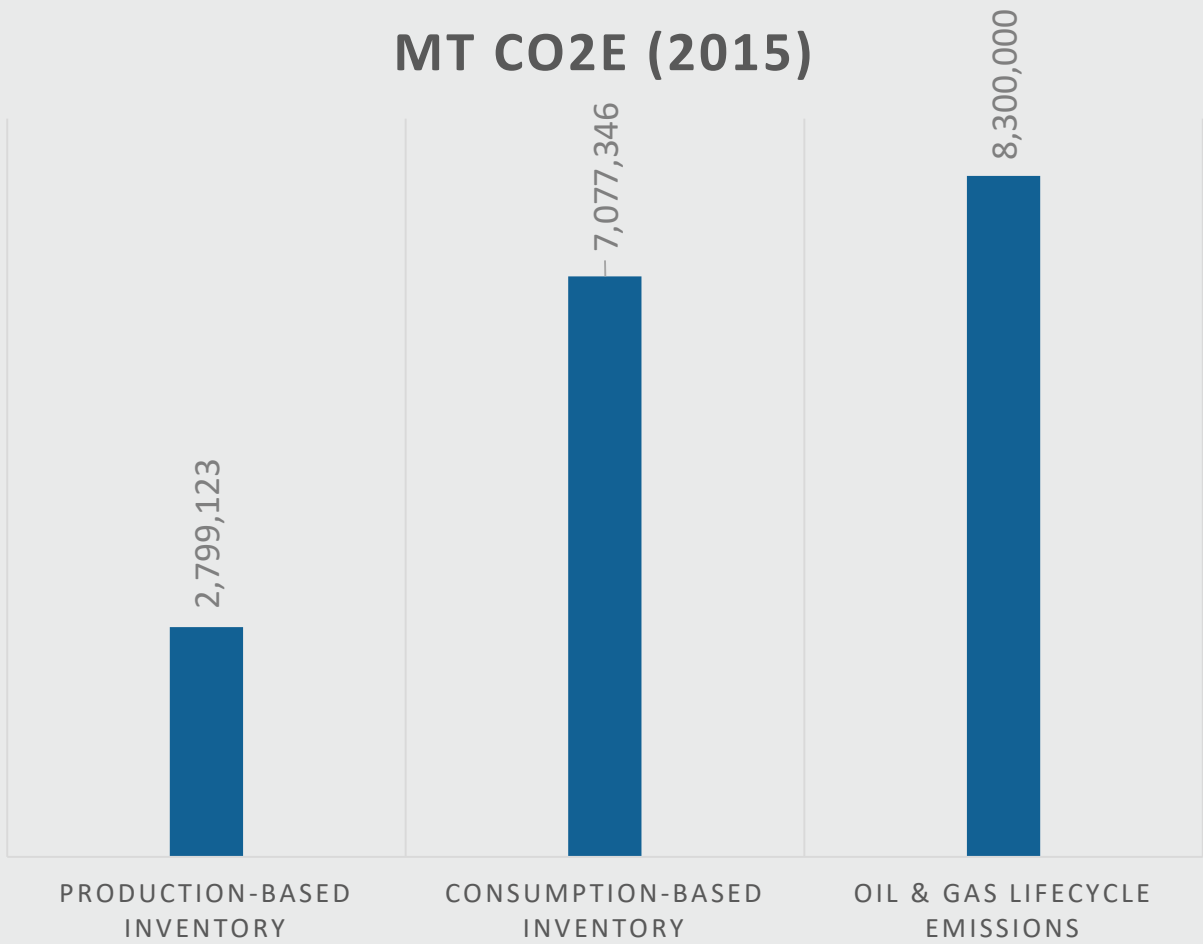
Objectives	Action Name	#
Governance		
Vulnerable infrastructure is elevated or relocated	Relocate/elevate critical infrastructure	FLD-10
	Elevate riverine levees	FLD-11

Adaptation – Draft Flooding & Sea Level Rise Actions

Long-term (2050 - 2100)

Objectives	Action Name	#
Structural/Physical		
Long-term physical adaptation strategies are selected and implemented based on additional research, community adaptation priorities, and prioritizing natural solutions whenever possible	Expand beach nourishment	FLD-12
	Construct living shoreline/berm	FLD-13
	Elevate street hardscapes	FLD-14
	Elevate streets/pathways	FLD-15
	Retrofit/extend sea wall	FLD-16
	Retreat/realign parking lots	FLD-17
	Extend/upgrade existing seawalls	FLD-18
Informational		
Additional long-term adaptation options are evaluated using the best available science	Investigate feasibility of managed retreat	FLD-19
	Evaluate feasibility of storm surge barrier at Alamitos Bay	FLD-20

Long Beach Inventories



Production-based Inventory

Emissions occurring from local activities (e.g., vehicle travel, home energy use, waste disposal)

Consumption-based Inventory

Lifecycle emissions that result inside/outside the City from consumption of goods & services occurring within the City (e.g. foods eaten, products purchases, fuels used)

Oil & Gas Lifecycle Emissions Inventory

Lifecycle emissions associated with oil & gas extraction activities occurring within the City

* Production-based inventory does not use a lifecycle approach

Mitigation



Buildings

Transportation

Waste

Adaptation



Extreme Heat

Air Quality

Drought

Flooding

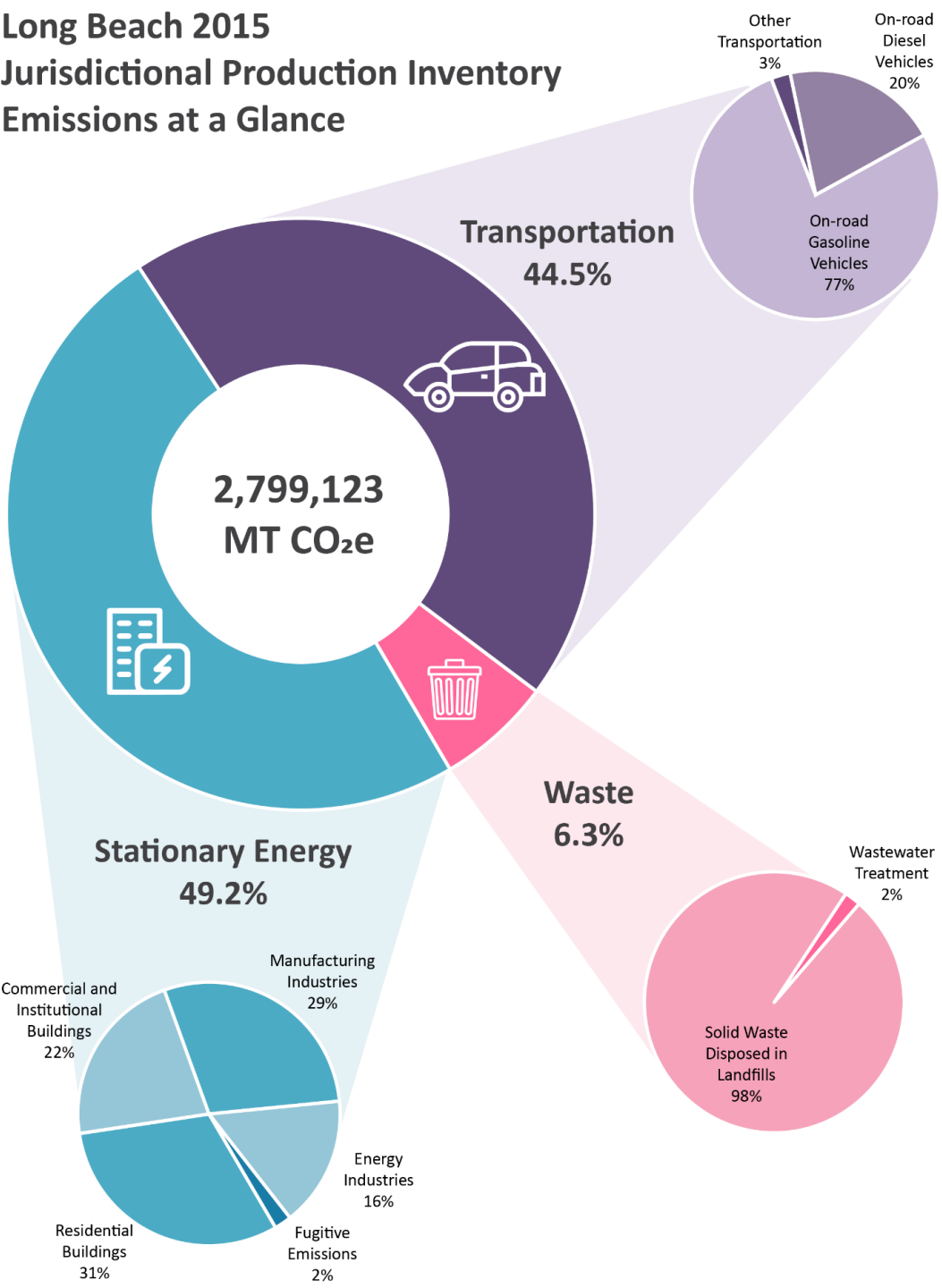
Sea Level Rise

EQUITY STRATEGY: Prioritize the enhancement and expansion of urban forest cover in neighborhoods most vulnerable to extreme heat, poor air quality, and are lacking in green space.

GHG Inventory

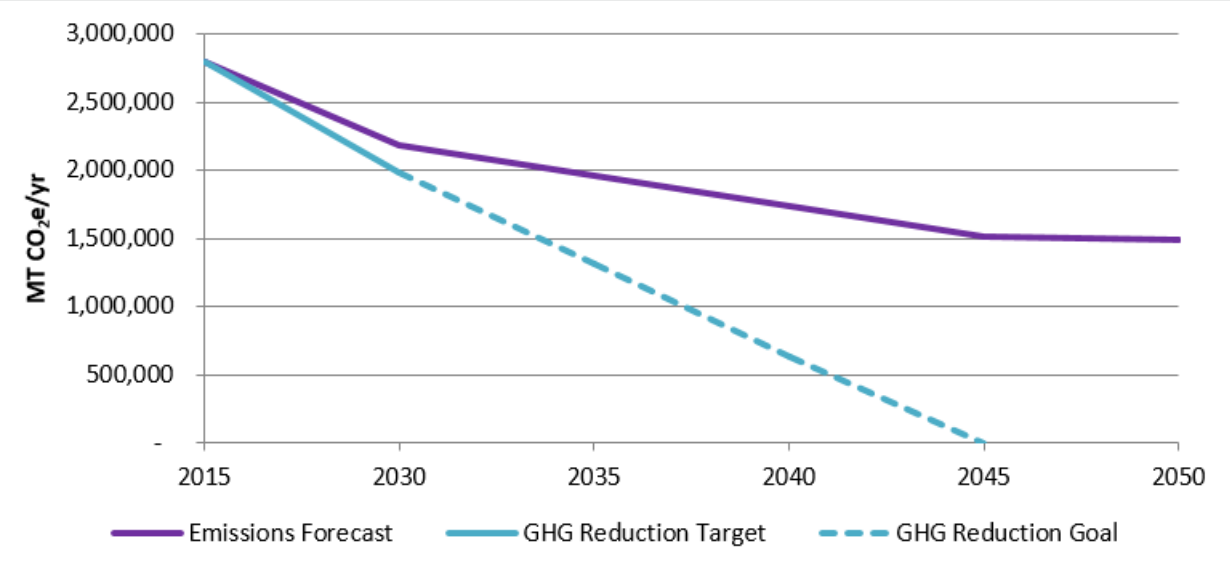
Sector	MT CO2e	% of Total
Stationary Energy	1,377,291	49.20%
Transportation	1,244,981	44.48%
Waste	176,850	6.32%
Total	2,799,123	100.00%
Per Capita	6.0	--

Long Beach 2015 Jurisdictional Production Inventory Emissions at a Glance




GHG Targets

City Emissions Targets vs. Forecasts 2015-2050



192,659
MT CO₂e
equivalencies



41,623
Passenger
vehicles
driven for one
year



32,618
homes'
electricity use
for one year

GHG Reduction Targets	
2030 GHG Target	3.04 MT CO ₂ e/Service Population
Business as Usual Forecast	2,176,931 MT CO ₂ e
Target Level	1,984,272 MT CO ₂ e
GHG Reductions Needed	192,659 MT CO ₂ e
2045 GHG Goal	Net-carbon Neutrality
Business as Usual Forecast	1,513,047 MT CO ₂ e
Target Level	0 MT CO ₂ e
GHG Reductions Needed	1,513,047 MT CO ₂ e

2030 GHG Reduction Target by Service Population	
Business as Usual Target	3.34 MT CO ₂ e
Emissions Target Level	3.04 MT CO ₂ e
Reduction Needed	0.3 MT CO ₂ e

Anticipated Pathway to Achieve GHG Emissions Reduction Target

Action	Assumptions	2030 MT C02e/year
Energy		53,310
SCE Green Rate	10% residential & non residential customers participate in SCE Green Rate program to purchase 100% carbon-free electricity; remaining 90% of customers receive SCE standard electricity rates	29,200
Local Solar	5% of City's solar potential is developed	5,575
Municipal Renewable Electricity	City purchases 100% carbon-free electricity for all municipal accounts	18,535
Transportation		30,480
Port Clean Trucks Program	10% reduction in diesel heavy-duty truck emissions by 2030	25,250
Enhanced VMT Reduction	1% VMT reduction in 2030 for light-duty vehicles	5,230
Waste		85,070
Commercial Recycling	75% of paper/cardboard component of commercial 2030 forecast waste disposal served by private haulers is diverted from landfills	45,340
Commercial Organics Diversion	75% of food scraps & green waste of commercial 2030 forecast waste disposal served by private haulers is diverted from landfills	39,730
Total		168,860

*Estimates based on high-level assumptions and may change based on incorporation of local data, etc., etc.

*Implementation costs vary.

Other Potential Pathways to Achieve GHG Emissions Reduction Target

Action	Assumptions	2030 MT C02e/year
Energy		
Renewable Electricity	Higher level commitment to communitywide renewable electricity supply	53,000-200,000+*
Oil & Gas		
Oil & Gas	Implementation of measures to reduce emissions from oil & gas extraction activities	Not quantified (20% less oil by 2030 due to depletion)
Transportation		
Port Clean Air Action Plan	Implementation of At-Berth and At-Anchor Regulation	25,000-104,000

*High end of range assumes 28% participation in Green Power (100% renewable), 52% participation in Clean Power (50% renewable energy), 19% participation in Lean Power (36% renewable energy) for residential and nonresidential customers (Clean Power Alliance 2018-19 Impact Report)

- Estimates based on high-level assumptions and may change based on incorporation of local data, etc.
- Implementation costs vary.

Other Potential Pathways to Achieve GHG Emissions Reduction Target

(continued)

Action	Assumptions	2030 MT C02e/year
Building Code		19,040
Reach Code – Flexible Implementation (residential)	Reach Code requires 10% energy efficiency improvement over CAL Green 2019 for mixed-fuel construction; assumes 50% of new construction is mixed-fuel and 50% omits natural gas infrastructure	4,480
Reach Code – Flexible Implementation (nonresidential)		2,200
Residential Energy Conservation Ordinance (RECO)	RECO applies to residential homes at point-of-sale; 2% of housing stock is sold each year; RECO program results in 10% energy efficiency improvement for each home; implementation begins in 2021	7,000
Commercial Retro-commissioning Ordinance	25% of office & public facilities/institutional buildings perform retro-commissioning by 2030; 15% energy savings from retro-commissioning	5,360

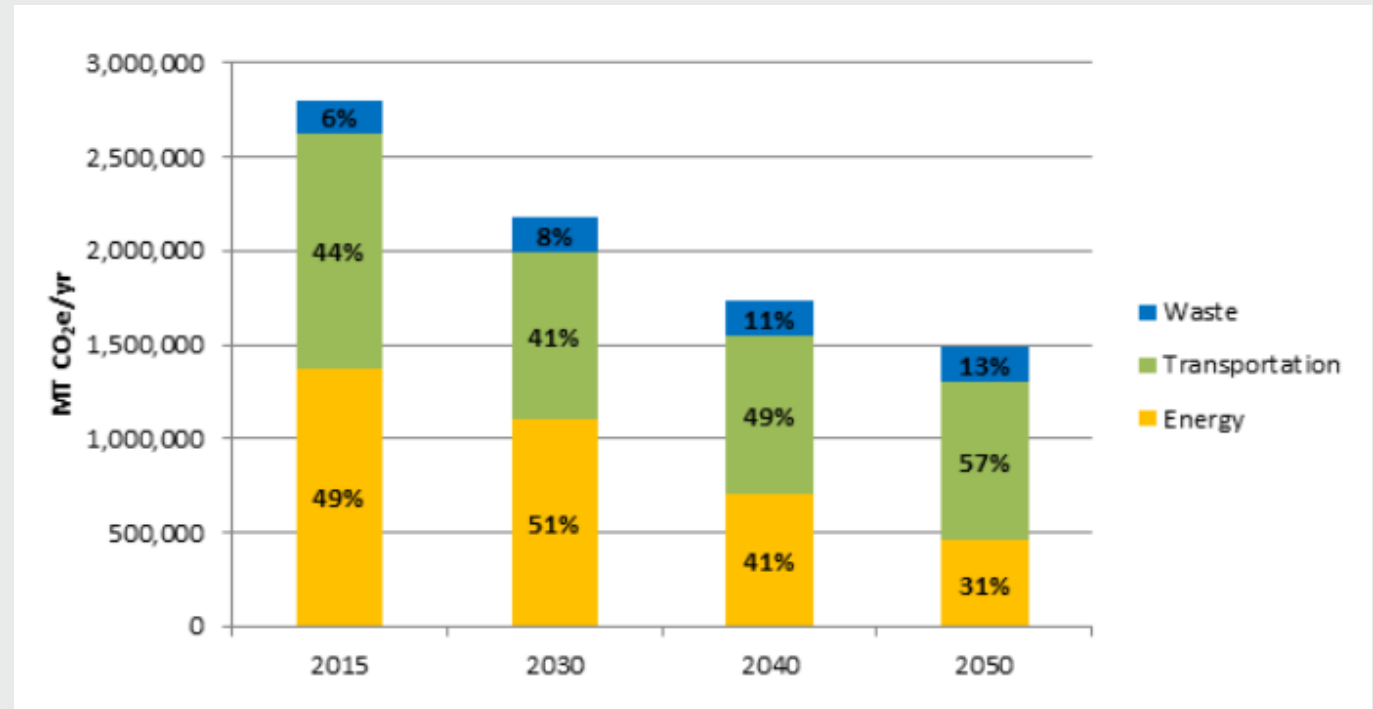
- Estimates based on high-level assumptions and may change based on incorporation of local data, etc.
- Implementation costs vary.

Energy – Renewable Electricity

Opportunity to commit to higher percentage of communitywide electricity supply from renewable sources

- City energy emissions forecast assumed a **60% renewable portfolio standard (RPS) by 2030** as mandated by SB 100
- Southern California Edison (SCE) has set a goal of an **80% carbon-free energy supply by 2030**
 - SCE delivered an estimated **48% carbon-free electricity to customers in 2019**, and **46% in 2018** (Edison International, Sustainability Report, 2019)
- Relevant CAAP energy action:
 - Increase the use of renewable electricity (BE-1)

City Business as Usual Emissions Forecasts 2015-2050



Waste – Recycling & Organics

CAAP relies heavily on waste actions to help meet the 2030 GHG reduction target

- Two waste actions quantified toward GHG reduction target:
 - 75% of paper/cardboard component of commercial 2030 forecast waste disposal is diverted from landfills
 - 75% of food scraps & green waste of commercial 2030 forecast waste disposal is diverted from landfills
- CAAP waste actions:
 - Ensure commercial recycling compliance with State law (W-1)
 - Implement organic waste collection for City-serviced accounts (W-2)
 - Expand organic waste collection communitywide (W-3)
 - Identify organic waste management options (W-4)



Building Energy & Air Quality – Oil & Gas Lifecycle Emissions

Additional strategies possible from the oil and gas sectors

- 8.3 million MT CO₂e resulting from lifecycle oil & gas emissions within City boundaries
- 96% from oil & 4% from gas extraction
- GHG emissions from oil extraction are anticipated to decrease (20% less oil by 2030) due to depletion
- CAAP oil & gas-related actions:
 - Building Energy (BE-8): Implement near-term measures to reduce emissions related to oil & gas extraction
 - Air Quality (AQ-7): Increase monitoring and regulation of oil extraction and refining process



Long Beach Oil & Gas Technical Memorandum, 2019

CAAP Actions that Address Oil & Gas



Transportation

- Electrify public & passenger vehicle transportation



Oil & Gas Extraction

- Implement near-term measures to reduce emissions related to oil & gas extraction



Building Energy

- Reduce building energy use through energy efficiency upgrades & electrification of end-use appliances



Air Quality

- Increase monitoring and regulation of oil & gas extraction processes

Transportation – Port Clean Air Action Plan Implementation

Additional strategies possible from Port programs

- San Pedro Bay Ports Clean Air Action Plan contains suite of actions:
 - Categories: Clean vehicles and equipment technology & fuels, Freight infrastructure planning & investments, Freight efficiency, Energy resource planning
 - Actions: shore power, reduced ship speeds, clean & alternative-fuel trucks, efficient locomotives, hybrid & electric cargo equipment & harbor craft, energy efficiency & renewable power generation, investment in cargo moving infrastructure
- CAAP Port-related actions:
 - Air Quality (AQ-6): Implement the Port Clean Air Action Plan
 - Transportation (T-4): Implement the Port Clean Trucks Program



Transportation – On-Road Transportation

- LB Transit expanding fleet of battery-electric buses
- Transportation (T-1): Increase frequency, speed, connectivity, and safety of transit options
 - Advance Systemwide Transit Analysis and Reassessment (STAR) strategies
 - Better understand travel patterns for shorter trips that could be made by transit
 - Better understand destinations that residents would like to access via transit to inform land use & transit planning
 - Increase rapid bus service and establish bus only lanes
 - Improve rider safety
 - Prioritize riders with disabilities and “Dial-A-Lift” Access Service



Transportation – Long Beach Airport

- Long Beach Airport Sustainability Plan
 - Addresses air emissions, energy, water conservation, water quality, solid waste & recycling, community
- Air Quality (AQ-3): Support the development of the Long Beach Airport Sustainability Plan
 - Reduce fuel use, reduce facility waste output, & electrify ground support equipment
 - Support the use of carbon offsets in ticket purchase
 - Support integration of sustainable fuels and electric-powered airplanes

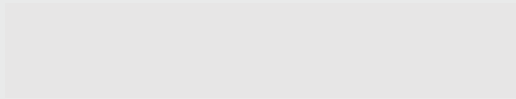


Climate Mitigation Process



Next Steps

- Hear Council input tonight
- Finalize additional measures and strategies to achieve GHG targets
- Adopt Plan (December 2020-January 2021)
- Commence California Environmental Quality Act (CEQA) process
- Final Plan and Environmental Document Adoption (Summer-Fall 2021)





Thank you

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