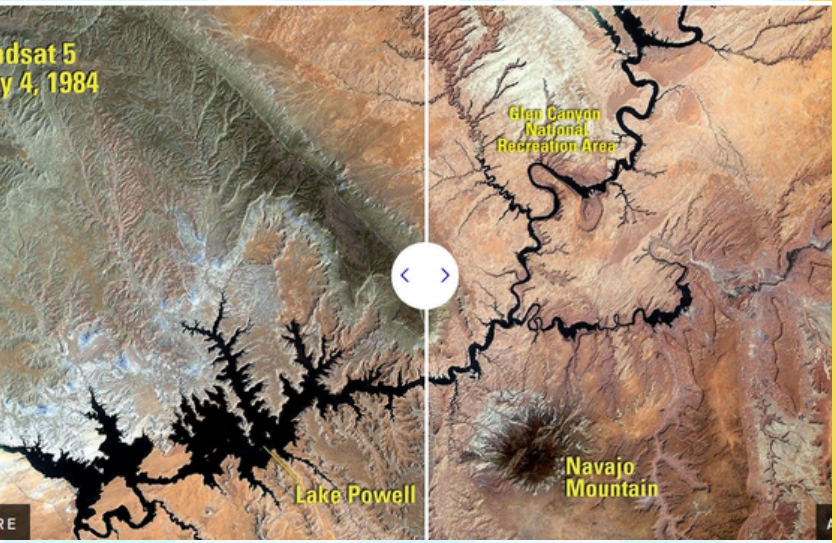
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GREENING CARSON

URBAN CANOPY EXPANSION AND HEAT MITIGATION IN CARSON, CALIFORNIA





SOURCE: NASA SCIENCE EARTH OBSERVATORY (SCIENCE.NASA.GOV)

EARTH'S ENERGY BALANCE & FORCING FACTORS

- Earth's Energy Balance: Equilibrium between incoming solar energy and outgoing thermal radiation.
- Forcing Factors: External drivers, such as greenhouse gas emissions, that alter this balance and trap heat.
- Feedback Loops: Secondary environmental responses (like atmospheric water vapor retention) that amplify warming.

Fossil Fuel Refining

Goods Movement & Transportation

LOCAL CONTRIBUTIONS TO CLIMATE CHANGE (CARSON, CALIFORNIA)



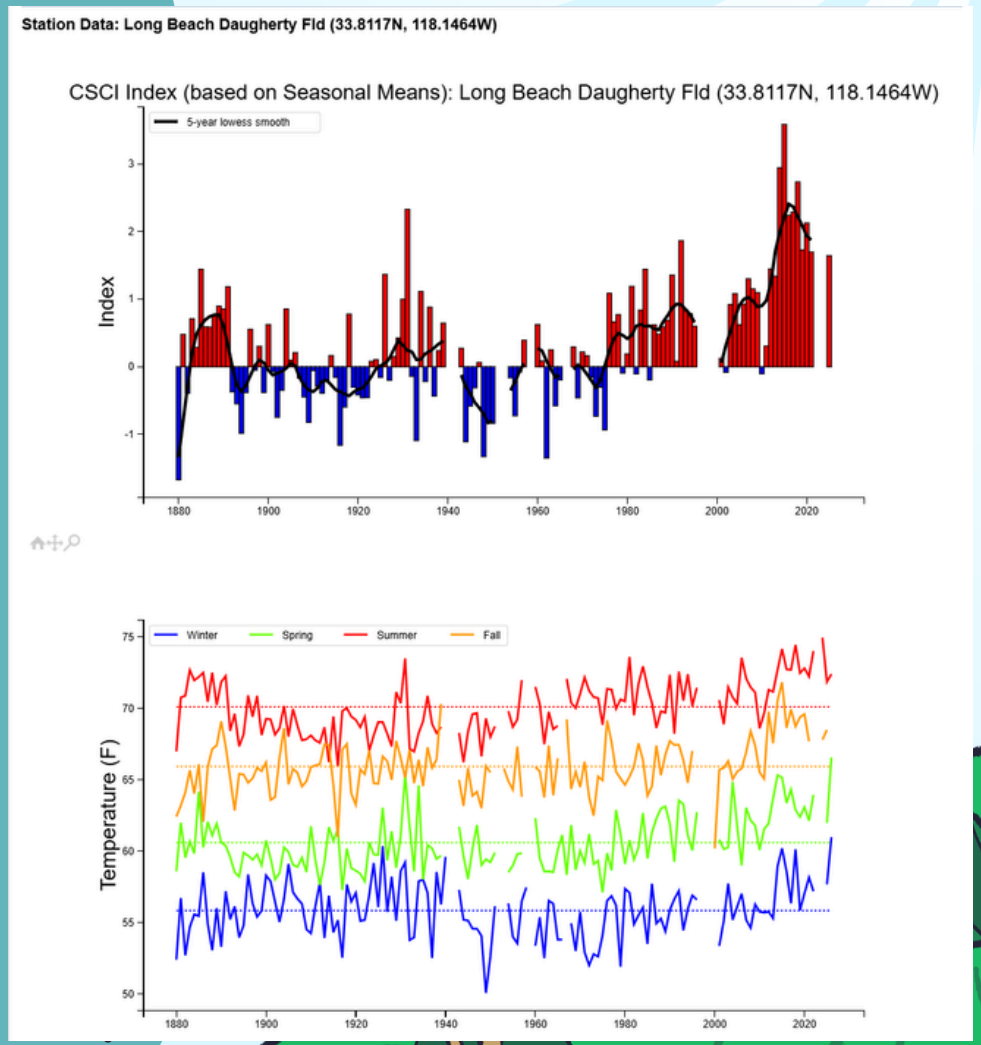
Source: Marathon Petroleum Corporation (marathonpetroleum.com)



Source: GXO Logistics Media Center (gxo.com)

LOCAL CLIMATE CHANGE

- Instrumental Record: Baseline annual average temperatures in the local region have increased significantly over the past century, backed by over 100 years of continuous meteorological data from the Long Beach Daugherty Field station.
- Seasonal Temperature Trends: Multi-decadal seasonal tracking demonstrates clear temperature increases across winter, spring, summer, and fall averages in the local area.



National Aeronautics and Space Administration (NASA). (2026). GISTEMP station data: Long Beach Daugherty Fld (Station ID: USW00023129). NASA Goddard Institute for Space Studies. Link

NATURAL ENVIRONMENT IMPACTS: URBAN HEAT ISLANDS & WILDLIFE PRESSURES

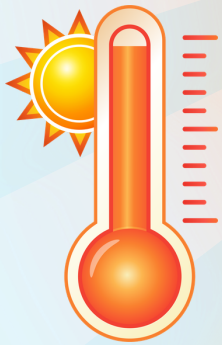
- Urban Heat Stress: Carson's heavy industrial zoning and dense paving create acute heat island conditions, threatening local microclimates.
- Specific Wildlife Impact: Local urban bird populations (such as house finches and mockingbirds) face habitat and foraging degradation from rising regional temperatures and prolonged dry spells.
- Canopy Goal: Strategic urban forestry expansion aims to increase vegetative shade to cool surface temperatures and restore localized wildlife nesting corridors.



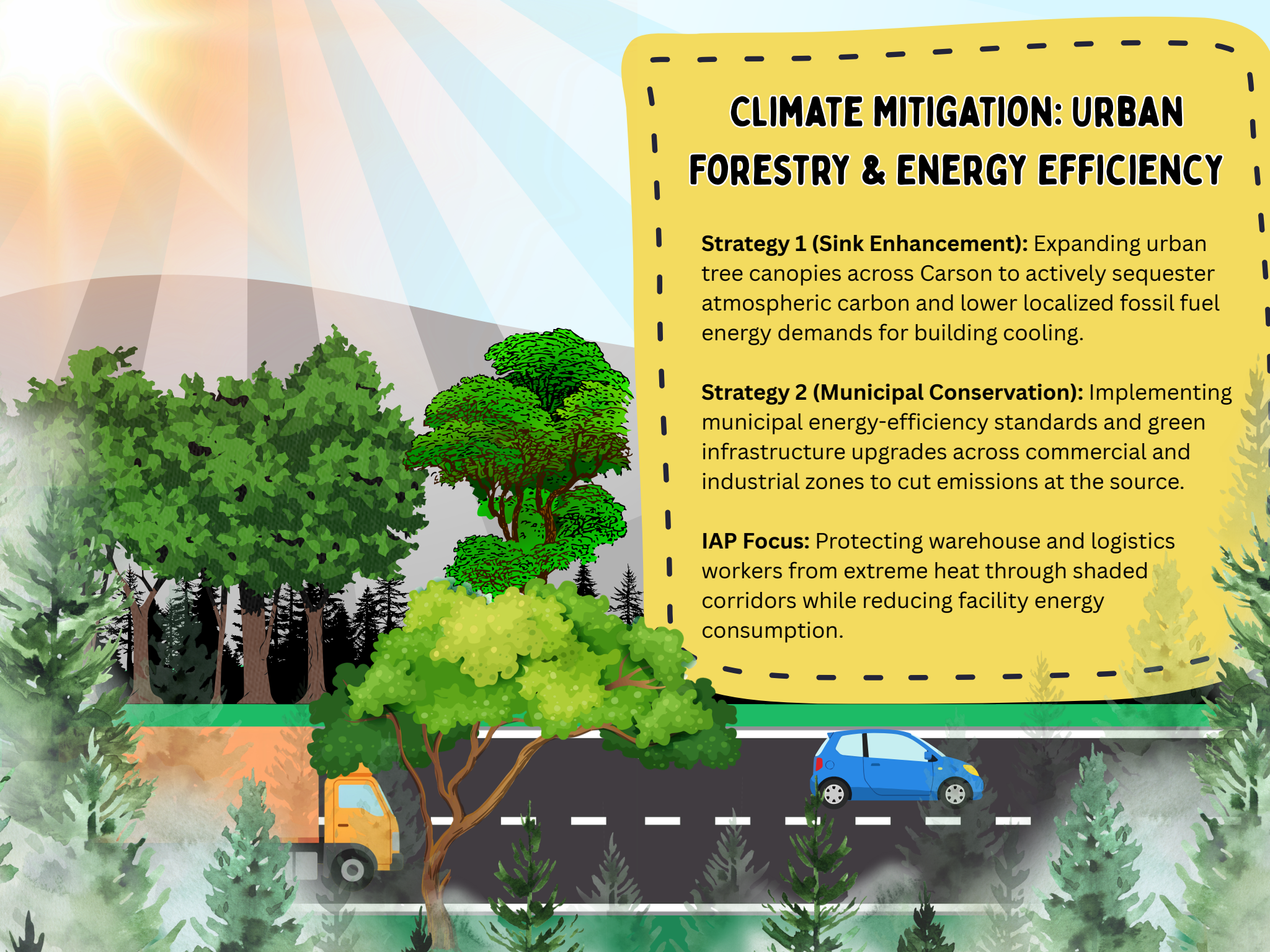
SOCIAL & ECONOMIC IMPACTS: PUBLIC HEALTH & WORKER VULNERABILITY

- Public Health Risks: Rising summer temperatures exacerbate extreme heat events, driving up heat-related illnesses and emergency room visits.
- IAP Focus (Outdoor Workers & Residents): Outdoor logistics and warehouse workers operating in Carson's heavy freight corridors face compounding occupational heat stress and industrial air pollution.
- Economic Burden: Households face rising utility costs for summer cooling, directly impacting lower-income residents and renters.








CLIMATE MITIGATION: URBAN FORESTRY & ENERGY EFFICIENCY
Strategy 1 (Sink Enhancement): Expanding urban tree canopies across Carson to actively sequester atmospheric carbon and lower localized fossil fuel energy demands for building cooling.
Strategy 2 (Municipal Conservation): Implementing municipal energy-efficiency standards and green infrastructure upgrades across commercial and industrial zones to cut emissions at the source.
IAP Focus: Protecting warehouse and logistics workers from extreme heat through shaded corridors while reducing facility energy consumption.

CLIMATE ADAPTATION: HEAT RESILIENCE & INFRASTRUCTURE UPGRADES

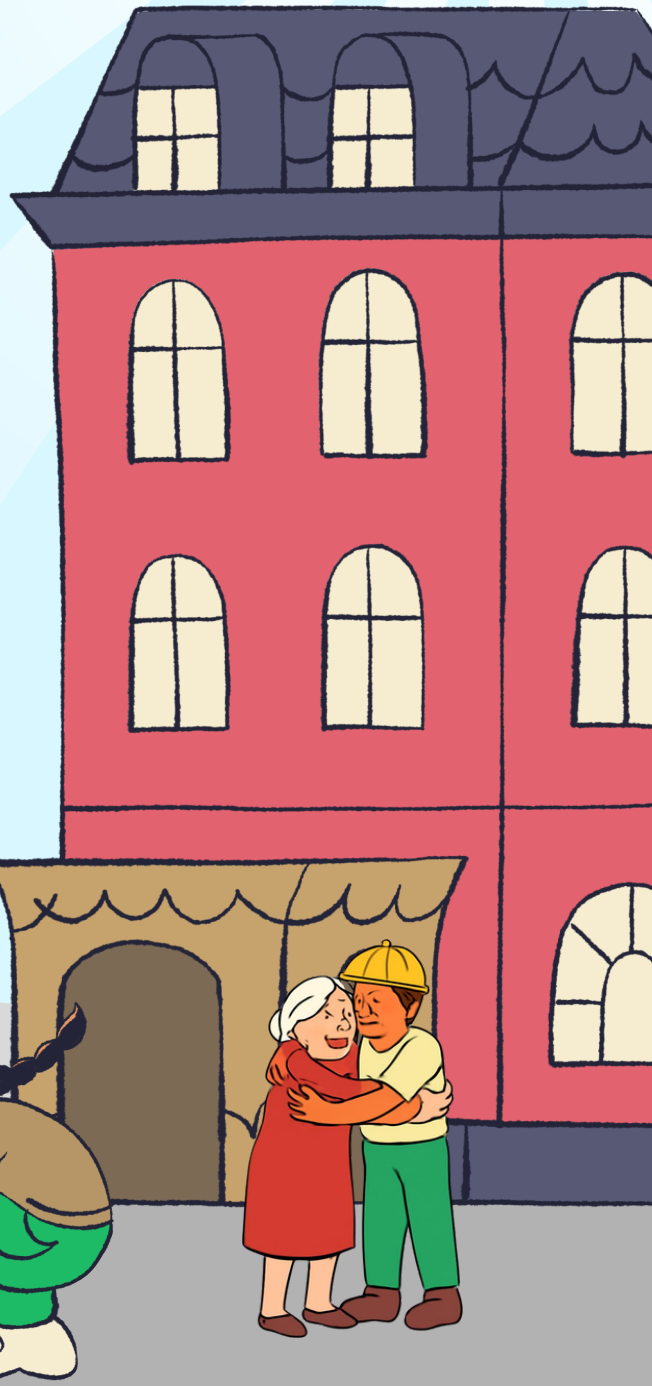
Strategy 1 (Behavioral & Urban Planning): Developing community cooling centers and revising municipal landscape codes to mandate high-albedo roofing and increased shade tree density.

Strategy 2 (Ecosystem Resilience): Selecting drought-tolerant, native tree species for urban forestry projects to withstand Southern California's declining water availability and prolonged dry spells.

IAP Focus: Safeguarding vulnerable low-income residents and outdoor workers against escalating urban heat island risks.







SUMMARY: GREENING CARSON FOR A RESILIENT FUTURE

Driver Awareness: Carson's industrial refining and freight logistics significantly contribute to local climate forcing and urban heat stress.

Measurable Vulnerability: Historical temperature records and rising extreme heat days disproportionately threaten local wildlife, public health, and outdoor workers.

Actionable Solutions: Strategic urban canopy expansion provides a dual-action framework for both carbon mitigation and local heat adaptation.



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