City of San Fernando

Climate Action and Resilience Plan

December 2025

ACKNOWLEDGEMENTS

The City would like to express their deepest gratitude to all those who contributed their time, expertise, and passion to the development of this Climate Action and Resilience Plan. Your support and collaboration have been instrumental in shaping a path forward toward a more resilient, sustainable, and equitable future for San Fernando.

City Council

Thank you to the City Council for your leadership, vision, and ongoing commitment to climate action and resilience. Your support has been essential in making this plan a reality.

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- Victoria Garcia, Vice Mayor
- Mary Mendoza, Councilmember
- Mary Solorio, Councilmember
- Patty Lopez, Councilmember

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The City is grateful to the dedicated staff across departments whose technical knowledge, coordination, and insights have informed the measures and actions within this plan. Your contributions reflect the strength of cross-departmental collaboration.

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- Kanika Kith

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Recreation and Community Services

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- Maribel Perez, Supervisor

Planning and Preservation Commission

The City is grateful to the members of the San Fernando Planning and Preservation Commission for their thoughtful review and consistent guidance throughout the development of this Climate Action and Resilience Plan, confirming the measures and actions are practical, forward-thinking, and aligned with the City's long-term vision for a resilient future.

- Francisco Solorio, Chair

- Mario Lua, Vice Chair
- Cecilia Martinez, Commissioner
- Fernando Diaz, Commissioner
- Flor Sanchez, Commissioner

Project Partners

A heartfelt thank you to the project partners for your expertise, innovation, and shared dedication to climate resilience. Your support helped confirm this plan reflects both best practices and local context.

- Pacoima Beautiful
- Climate Resolve
- Fernandeño Tataviam Band of Mission Indians

Advisory Group Committee and Community Members

To the members of the Advisory Group and the broader community—thank you for your time, input, and sharing your lived experiences. Your voices have shaped this plan to be responsive, grounded, and inclusive. Your participation confirms this plan truly reflects the priorities of our community.

- Alex Quintero [Ethereal], Committee Member
- Maria Salgado, Committee Member
- Melody Espinoza, Committee Member
- Gisel Pineda, Committee Member
- Roxana Guzman, Committee Member
- Raymond Salas, Committee Member
- Nora Rosete, Committee Member
- Justan Torres, Committee Member

Together, the City and its partners are laying the foundation for a healthier, safer, and more climate-resilient future. Thank you for being part of this important work.

LAND USE AND CLIMATE INNOVATION NOTICE

As communities in California experience more frequent, prolonged, and severe impacts from climate change, communities and governments at all scales are developing strategies and implementing actions to build a climate-resilient future. However, many jurisdictions, especially under-resourced communities in California, lack the capacity, tools, guidance, and resources to effectively prepare for climate impacts.

The Adaptation Planning Grant Program (APGP) addresses this capacity gap by providing funding to help fill planning needs, providing communities with the resources to identify climate resilience priorities, and support the development of climate resilience projects across the state. The APGP enables communities and Tribal Nations to address climate risk and adaptation considerations into planning activities and prepare for climate readiness and resilience in the long term.

- The APGP is an initiative of the Integrated Climate Adaptation and Resiliency Program (ICARP) housed within the Governor's Office of Land Use and Climate Innovation. ICARP advances statewide climate adaptation and resilience by coordinating investments, partnerships and climate science to ensure people, natural systems, and the built environment are protected, prepared, and thrive in the face of climate change.
- Through direct and equity-focused investments and resources, ICARP helps build climate adapted and equitable communities in California, with a focus on solutions that both address the impacts of climate change and reduce greenhouse gas emissions. ICARP works to advance these priorities across all levels of government by developing actionable science and research; providing guidance, tools, and technical assistance; and administering climate resilience-focused grant programs.

Learn more: https://lci.ca.gov/climate/icarp

CA Governor's Office of Land Use and Climate Innovation

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EXECUTIVE SUMMARY

A. INTRODUCTION AND PURPOSE

The City of San Fernando faces a rapidly changing climate, along with the challenges and opportunities that come with building a healthier, safer, and more resilient future. The Climate Action & Resilience Plan (CARP) provides a strategic roadmap to reduce greenhouse gas (GHG) emissions, prepare the community for worsening climate impacts, and guide investments that support long-term sustainability, equity, and community well-being.

The purpose of the CARP is to:

- Reduce GHG emissions in alignment with State targets.
- Protect community members, businesses, and infrastructure from climate-driven hazards such as extreme heat, drought, poor air quality, and stormwater flooding.
- Advance equity by deploying climate investments that benefit frontline communities such as renters, low-income households, and vulnerable populations, including local native citizens.
- Strengthen local resilience by improving energy reliability, maintaining safe and affordable water access, enhancing transportation safety and connectivity, expanding citywide tree canopy, and supporting neighborhood-level disaster preparedness.
- Align San Fernando's policies with regional and State frameworks.

The CARP reflects input provided by the community as part of extensive community engagement, including multilingual outreach, an eight-member Community Advisory Group (CAG), survey responses from more than 175 residents, walkshops, and pop-up events embedded in widely attended community gatherings. This input helped shape a plan that reflects San Fernando's values, lived experiences, and vision for a thriving future.

B. CARP VISION

San Fernando's vision is to create a safe, healthy, and climate-resilient city where all residents, regardless of income, age, language, or housing status, can thrive. This vision is guided by the City's five Equity Guardrails, developed with the Community Advisory Group:

1. Fair and Inclusive Access to Resources and Opportunities
2. Sustainable City Revenue and a Vibrant Downtown
3. Cultural Resilience in Community Sustainability
4. Neighborhood Investment that Safeguards Housing Stability
5. Safe, Healthy, and Connected Communities

The CARP envisions homes that stay safe during extreme heat, shaded walking and biking routes across the city, clean and reliable energy, abundant urban trees, resilient water systems, and neighborhoods equipped with the tools and resources needed to withstand future climate stresses.

San Fernando will lead with integrity, transparency, and community partnership—advancing practical, achievable strategies while promoting equity at every stage of implementation.

C. CLIMATE HAZARDS FACING SAN FERNANDO

San Fernando faces several accelerating climate hazards:


Extreme Heat


Stormwater Flooding


Drought


Poor Air Quality

EXTREME HEAT

San Fernando has already experienced multiple extreme heat events over the past two decades, reflecting a statewide trend of increasingly severe and frequent heat waves. Currently, extreme heat days—defined as days above the 98th percentile temperature (101.7°F)—occur between April and October, averaging about four days per year. By mid- and end-century, the city is projected to experience dramatic increases in extreme heat, with the annual number of extreme heat days rising from 3 days historically to 17 days by mid-century and 36 days by end-century. Extreme heat months will also expand from late spring–fall to nearly year-round, disproportionately affecting older adults, children, and low-income residents.

DROUGHT

Over the last 20 years, San Fernando has faced more frequent and prolonged droughts, including major events between 2007–2010, 2012–2017, and 2021–2022. Looking forward, drought conditions are expected to intensify due to higher temperatures and changing precipitation patterns. Future dry periods are projected to coincide more often with extreme heat, compounding water scarcity and affecting local landscapes, tree canopy health, and water reliability. By the end of the century, the average annual dry spell could extend from 146 days historically to 165 days, stressing natural habitats, parks, cultural sites, and groundwater-dependent systems.

STORMWATER FLOODING

Historically, San Fernando's most severe flood events have been linked to intense atmospheric river storms, with the most significant event recorded in 1934. Although current exposure to 100-year and 500-year flood events is relatively low, localized flood risks persist—particularly near the Pacoima Wash and in areas that could be affected by failure of Lopez Dam. With climate change, storms exceeding historical design standards may occur more frequently, overwhelming stormwater systems. The Los Angeles region may see a 25–30 percent increase in the wettest annual day by end-century, with maximum one-day precipitation rising from 1.9 inches (baseline) to 2.1 inches, underscoring the need for enhanced stormwater capture and green infrastructure.

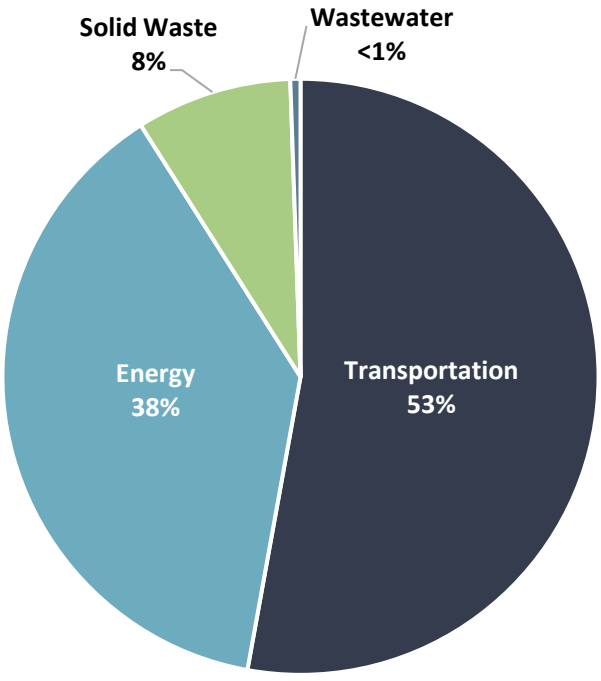
POOR AIR QUALITY

San Fernando experiences some of the poorest air quality in California, with historic spikes linked to regional wildfires, stagnant air during heat waves, and prolonged drought. Days exceeding national ozone standards have become more common, with highs such as 64 days above the standard in 2017 and 62 days in 2020. Currently, the city faces recurring exposure to dust, smog, and wildfire smoke, which poses health risks for residents, especially youth, older adults, and those with respiratory conditions. Looking ahead, air quality is expected to worsen due to increased wildfire activity, hotter temperatures that drive ozone formation, and fewer natural air filtration events, reinforcing the need for local protections and emissions reductions.

D. COMMUNITY GREENHOUSE GAS EMISSIONS

The CARP includes a baseline 2021 communitywide GHG emissions for San Fernando, with major contributors including:

- Transportation: On- and off-road vehicles, making up 53 percent of total emissions
- Energy: Residential and non-residential building electricity & natural gas usage, making up 23 percent of total emissions
- Solid Waste: Methane generation from landfilled solid waste, making up eight percent of total emissions
- Wastewater: Emissions from the treatment and processing of communitywide wastewater, making up less than one percent of total emissions.



E. CLIMATE ACTION AND RESILIENCE MEASURES

The CARP is organized into four interconnected systems. Within each system, the City identified targeted measures and actions that together advance climate change mitigation, resilience and equity.

Below is a summary of San Fernando's climate action and resilience measures.

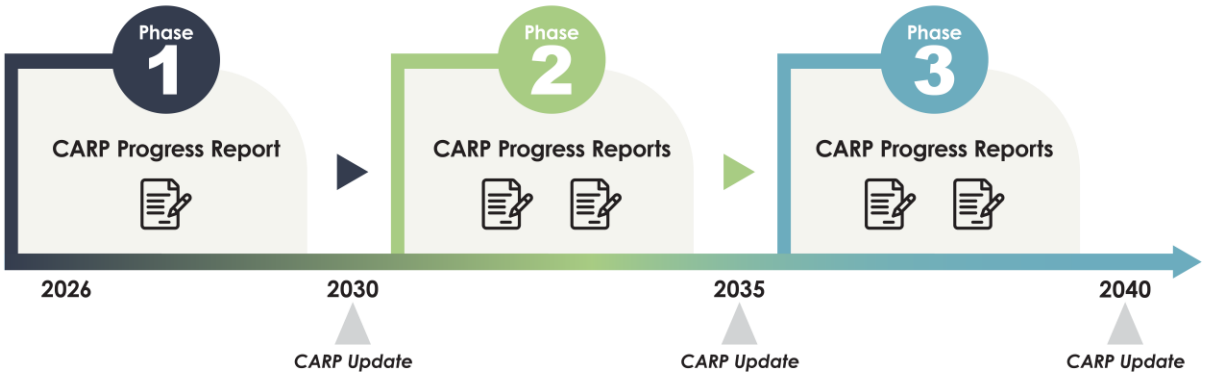
Measure ID	Measure Text
Cornerstone Measure	
CS-1	Expand and strengthen neighborhood resilience by supporting the development of year-round community resilience hubs within trusted local facilities. These hubs would provide residents with accessible resources to address the city's most pressing climate hazards.
Social and Governance System	
SG-1	Revise protocols and procedures internal to the City to integrate a climate and equity perspective into all government operational decision-making, prioritizing increased investments in CARP implementation to support vulnerable populations.
SG-2	Build neighborhood-wide resilience by supporting local networks, training, and resources that empower residents to respond to climate risks. Efforts will emphasize multilingual outreach, leadership development, and partnerships that strengthen capacity in historically underserved communities, including sovereign Tribal Nations, through recognizing cultural heritage in programs and projects.
Mobility and Land Use System	
MLU-1	Reduce reliance on single-occupancy vehicles by promoting housing near transit-accessible corridors and downtown; expanding open space, mixed-use development with shops, services, and local employment; and supporting alternative commuting options for residents who work outside the city.
MLU-2	Expand and optimize the San Fernando trolley network to improve route coverage, accessibility, safety, and connections to key destinations such as downtown, schools, parks, transit hubs, and native and other cultural centers, while integrating community feedback on service frequency, financial feasibility, and minimal disruption to street infrastructure.
MLU-3	Increase walking, biking, and other active transportation in San Fernando by upgrading sidewalks, crosswalks, bike lanes, and pedestrian paths to improve safety, accessibility, and connectivity. Prioritize shaded routes, stormwater capture, lighting, ADA-compliant infrastructure, and secure bike parking to confirm all residents have equitable access to convenient and safe active transportation options.
MLU-4	Prepare the city for widespread zero-emission vehicle adoption by investing in universal EV charging stations (public and commercial), offering community EV education and ride-and-drive events, and promoting safe passenger and commercial EV use as vehicle costs decline.
Buildings and Utilities System	
BU-1	Support communitywide transition to carbon-free electricity by partnering with Southern California Edison and regional agencies to expand rooftop solar, battery storage, and neighborhood-scale microgrids. Improve electrical system resilience with targeted upgrades such as backup power for schools and resilience hubs, and promote demand-response programs that help residents and businesses reduce peak-time energy use and lower monthly bills.
BU-2	Require new buildings to meet high standards for health, safety, and resilience by incorporating all-electric systems, efficient cooling, and extreme heat protections while respecting San Fernando's historic character.
BU-3	Connect building owners and renters with incentives, rebate, and education programs to upgrade existing homes and businesses, enabling them to become zero-carbon and resilient to extreme heat, flooding, and poor air quality.
BU-4	Decarbonize City-owned buildings through energy efficiency upgrades, renewable energy integration, and electrification of key systems. Partner with local trade schools and workforce programs to train and employ residents in implementing these projects, creating green jobs and building community capacity while demonstrating City leadership in sustainability and resilience.

Measure ID	Measure Text
Urban Ecosystem	
UE-1	Enhance the resilience of San Fernando's water systems by integrating stormwater management, potable water conservation, and equitable access to sustainable water resources, confirming all residents have reliable access to clean, safe, and affordable water as a basic human right.
UE-2	Increase citywide tree canopy and community-centered green spaces to reduce the urban heat island effect by supporting and implementing the strategies outlined in the Urban Forest Management Plan.
UE-3	Increase diversion of landfilled organics in San Fernando to achieve compliance with SB 1383 by expanding food scrap and green waste collection, using recovered organic waste products locally, and partnering with schools and nonprofits to recover surplus edible food for residents.

F. IMPLEMENTATION TIMEFRAME

The CARP includes a phased implementation approach designed to be practical, financially responsible, and equity-centered. Actions are categorized based on the following expected time horizon:

- **Short-Term (0-3 years):** Foundational actions such as resilience hub planning, community outreach, urban forestry expansion, and permitting updates.
- **Medium-Term (3-5 years):** Infrastructure improvements, building upgrades, transit enhancements, EV charging expansion, and shaded mobility corridors.
- **Long-Term (5-10+ years):** Large-scale capital projects, deeper decarbonization of buildings, citywide microgrid deployment, and major stormwater and green-infrastructure investments.



The City will complete biennial progress reports and a comprehensive CARP review and update every five years to incorporate new science, changing community needs, funding opportunities, and lessons learned.

The CARP positions San Fernando to become a model for city climate leadership by building on its compact size, strong cultural identity, and deeply engaged community. Through continued collaboration among city departments, local organizations, and neighborhood leaders, San Fernando will help advance climate action that reflects community needs and supports long-term resilience. This work will help confirm that people remain safe and connected and that San Fernando continues to thrive as climate conditions change.

ACRONYMS, ABBREVIATIONS, AND GLOSSARY

A list of glossary terms used in the City of San Fernando's Climate Action and Resilience Plan.

A

Active Transportation – A means of transportation that is powered by human energy, for example walking, biking, or rolling.

Adaptation – Adjustment or preparation of natural or human systems to a new or changing environment which moderates harm or exploits beneficial opportunities.

Adaptive Capacity – A city's ability to cope with and adjust to the impacts of climate change.

Atmosphere – The envelope of gases surrounding the Earth; the gases that make up the atmosphere primarily include nitrogen (78%) and oxygen (21%), as well as argon, helium, carbon dioxide, methane, and water vapor in trace amounts.

B

Backup Power – Any device that provides instantaneous uninterruptible power, for example, a battery or generator.

C

CALGreen – An abbreviated reference to the California Green Building Standards code, which sets minimum requirements for sustainable practices for construction (residential and commercial) projects throughout the state. It is updated every three years in accordance with the building cycle.

CALGreen Tier 1 & 2 – Requirements beyond the mandatory measures laid out by CALGreen: Tier 1 adds additional requirements to the mandatory sustainability requirements, and Tier 2 further increases those sustainability requirements.

California Air Resources Board (CARB) – The lead agency for climate change programs that also oversees all air pollution control efforts in California to attain and maintain health-based air quality standards.

Carbon-neutrality/Net-Zero Emissions – Balancing anthropomorphically generated emissions by removing GHGs from the atmosphere in a process known as carbon sequestration.

Cascading Impact – Climate hazard caused impacts that compromise infrastructure or disrupt critical services (e.g., power supply or water conveyance) broadening the scope of impact past a singular subject to reliant subsystems and populations

Climate Action and Resilience Plan (CARP) – Community's framework for improving our health and environment, limiting our global impact by reducing GHG emissions, and increasing our resilience in the face of climate change

Climate Change Vulnerability Assessment (CCVA) – Identifies how exposed, sensitive, and adaptable a system or community is to climate hazards. It informs adaptation planning by highlighting high-risk areas and guiding resilience strategies.

Climate Hazard – A potential occurrence of climate related physical events or trends that may cause damage and loss.

Climate – The average of weather patterns over a long period of time (usually 30 or more years).

Climate Change – A change in the average conditions — such as temperature and rainfall — in a region over a long period of time.

Community Based Organization (CBO) – A public or private nonprofit organization that is representative of the community or specific segments of a community and provides educational or outreach services to the community.

Carbon Dioxide (CO_2) – A naturally occurring gas and a by-product of burning fossil fuels and biomass.

Carbon dioxide equivalent (CO_2e) – A metric measure used to compare the emissions from various greenhouse gases based upon their GWP.

Cultural Resilience – A community's ability to sustain and adapt its cultural values, traditions, and social networks in the face of climate and other stressors. It emphasizes integrating community-defined cultural assets such as Indigenous ecological knowledge, culturally significant spaces, and community-led preparedness practices into sustainability and resilience efforts to confirm strategies are effective, inclusive, and grounded in local identity.

Cultural Resources – Cultural resources include the physical, spiritual, and traditional places, objects, landscapes, and practices that hold historical, cultural, or ancestral significance. This includes but is not limited to archaeological sites, historic structures, cultural landscapes, traditional cultural properties, and sacred or culturally important sites identified by sovereign Tribal Nations.

D

Decarbonization – Replacing technologies and services that run on fossil fuels (e.g., natural gas) with ones that run on zero-carbon sources of energy (for example electricity from renewable energy like solar or wind power), ideally from renewable sources.

Distributed Energy Resources (DERs) – Small-scale electricity demand or supply resources that are interconnected to the electric grid and usually located close to load centers where they can be used individually or in aggregate to support the grid.

E

Emissions – The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Electric Vehicle (EV) – A vehicle that uses one or more electric motors or traction motors for propulsion.

Energy Storage – Can provide frequency regulation to maintain balance between the network's load and detected power generated, achieving more reliable power supplies. Batteries are an example of energy storage.

F

Fossil Fuel – A general term for fuel formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the Earth's crust.

G

Greenhouse Gas (GHG) – A gas that absorbs infrared radiation, traps heat in the atmosphere and contributes to the greenhouse effect.

Global Warming Potential (GWP) – Total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1.

Greywater – Graywater refers to water that has been used domestically, commercially, and industrially.

I

ICLEI – Local Governments for Sustainability; a global network of more than 1,750 local and regional governments committed to sustainable urban development – emissions estimates were calculated using ICLEI's best available methodologies.

Impact – Impacts on natural and human systems – including lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure – resulting from the interaction between climate hazards and the vulnerabilities of affected systems or assets.

Intergovernmental Panel on Climate Change (IPCC) – The United Nations body for assessing the science related to climate change.

M

Methane (CH_4) **– A hydrocarbon that is a greenhouse gas produced through anaerobic (without oxygen)** decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Metric Tons (MT) – Common international measurement for the quantity of greenhouse gas emissions – one metric ton is equal to 2205 pounds or 1.1 short tons.

Metric tons carbon dioxide equivalent (MT CO_2e) – Metric/unit that GHG emissions are reported per standard practice; when dealing with an array of emissions, the gases are converted to their carbon dioxide equivalents for comparison purposes.

Microgrid – A group of interconnected loads and distributed energy resources that act as a single controllable entity in respect to the grid. A microgrid can operate in "island mode" and disconnect from the grid or operate while connected to the grid.

Mitigation – An action or ongoing efforts to minimize, prevent, or eliminate negative impacts or effects.

N

Nature-based Solution (NBS) – Strategies that harness natural systems—like trees, wetlands, soils, and green infrastructure—to address challenges like stormwater flooding and heat. These solutions rely on the capacity of nature to absorb carbon, regulate temperature, manage water, and improve overall ecosystem health while supporting human well-being.

Nitrous oxide (N_2O) – A powerful greenhouse gas with a high global warming potential; major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.

O

Organic Material – Natural or organic materials, for example food scraps and yard waste.

R

Reach Code – A building code which requires a higher level of energy efficiency than the standard statewide code. Reach codes are allowed and encouraged under Title 24.

Renewable Energy – Energy derived from natural sources that are replenished at a higher rate than they are consumed (ex. wind, biomass).

Resilience – Ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate.

S

Sensitivities – The extent to which a species, natural system, community, asset, or related system is impacted by changing climate conditions.

Social Equity – All people having equal access to and influence on the resources and benefits of society.

Socially Vulnerable/Socially Sensitive Community – Although climate hazards have the potential to affect all residents, the severity of impacts is heavily shaped by demographic factors like race, socioeconomic status, gender, housing status, and more. Moreover, sensitive populations have less capacity to adapt to climate hazards, because of long-standing structural and institutional inequities. Social vulnerability is scored via Social Vulnerability Index and identifies these socially vulnerable communities described above.

T

Transportation Demand Management (TDM) – Focuses on how people make their transportation decisions, and facilitates greater usage of infrastructure for transit, ridesharing, walking, biking, and telework.

V

Vehicle Miles Traveled (VMT) – The number of total miles traveled by motor vehicle that are generated over a population over a given timeframe (e.g., 1 year).

Vulnerability – The propensity or predisposition to be negatively affected.

W

Weather – The state of the atmosphere over a short period of time (usually an hour or day), describing if it is hot or cold, wet or dry, calm or stormy, clear or cloudy, etc.

Z

Zero-Emissions Vehicle (ZEV) – A vehicle that never emits exhaust gas from the onboard source of power.

THE CLIMATE ACTION AND RESILIENCE PLAN

A. PURPOSE OF THE CARP

The purpose of the City of San Fernando's Climate Action and Resilience Plan (CARP) is to provide a comprehensive, community-driven strategy for reducing greenhouse gas (GHG) emissions, preparing for the impacts of climate change, and promoting environmental justice, integration of Tribal values, and equitable distribution of benefits. The CARP is designed to help the City comply with California's evolving climate policies while also supporting San Fernando's ongoing commitment to sustainable development, environmental justice, and community resilience. As a policy and planning tool, the CARP serves to guide the integration of climate considerations across community operations and future planning efforts, confirming a cohesive, long-term approach to protecting the environment, public health, and quality of life for all residents.

B. CARP VISION

The City of San Fernando envisions a future where every resident thrives in a healthy, equitable, and climate-resilient community. The Climate Action and Resilience Plan (CARP) presents a shared vision for transforming San Fernando into a model of sustainability, where clean air, reliable water, and climate-ready housing are fundamental rights for all. This vision is rooted in local pride, cultural heritage, and environmental stewardship.

Imagine a San Fernando where homes and businesses are energy-efficient and powered by renewable energy. Streets are shaded by lush tree canopies and connected by safe, multimodal pathways. Parks, schools, and businesses serve as neighborhood resilience hubs. Natural and built environments work together to protect public health, conserve water, and restore ecosystems, all while preserving the historic character and cultural vibrancy that define San Fernando.

Equity is at the heart of this transformation. The City acknowledges that climate impacts are not borne equally and that solutions must intentionally close gaps in opportunity and well-being. To achieve this, the CARP is guided by five Equity Guardrails, developed through collaboration with the Advisory Group and the project partners:

1. **Prioritize Fair and Inclusive Access to Resources and Opportunities**: Provide all neighborhoods and communities, including underhoused and unhoused residents with access to resources, opportunities, and decision-making processes. This means identifying and addressing barriers such as financial constraints, language differences, transportation challenges, and historical exclusion such as redlining, displacement, and disinvestment. By acknowledging a history of harm, engaging directly with community members and co-creating solutions, we can expand access, build trust, and confirm that every voice is heard.
2. **Strengthen Sustainable City Revenue and Support a Vibrant Downtown**: Focus on revitalizing Downtown San Fernando by upgrading infrastructure, attracting unique retail and food establishments run by small businesses that enhance local character and culture, and expanding diverse housing options. Revitalize Downtown San Fernando consistent with climate goals to serve as a model for

achieving climate emission reduction and resilience strategies at a neighborhood-scale. Reduce City revenue reliance on regressive fees and fines through equitable revenue strategies that provide long-term financial stability for the City while supporting historically underserved communities. Focus new growth within the downtown core to foster a strong sense of place and vitality, increasing the City's ability to invest in community-enhancing strategies for all of San Fernando.

3. **Foster Cultural Resilience in Community Sustainability**: Recognize and integrate community values, cultural assets, and social support systems into program design to foster inclusivity and trust. Climate and resilience initiatives should reflect the unique histories, traditions, and needs of each community—whether it be by incorporating Indigenous ecological knowledge, supporting culturally relevant gathering spaces, or supporting disaster preparedness, response, and recovery strategies that are accessible and community-led. By honoring local identities and strengthening social networks, we can create strategies that are both effective and deeply rooted in the communities they serve.
4. **Invest in Neighborhoods to Safeguard Housing Stability**: Actively monitor and adjust strategies related to investments and infrastructure upgrades so that climate and resilience goals are met while also avoiding gentrification and displacement of long-term residents and businesses. Confirm that investments in housing, infrastructure, and community improvements better equip neighborhoods to address climate goals without resulting in long-term residents or local businesses moving out. By prioritizing policies that protect affordability—such as a range of housing development types (including accessory dwelling units, middle housing, and affordable housing), tenant protections, and support for small businesses — we can prevent displacement while enhancing the quality of life. Strategic investments should uplift communities, preserving their identity and culture while expanding opportunities for all who call them home.
5. **Foster Safe, Healthy, and Connected Communities**: Prioritize safety, security, and well-being by building resilient, interconnected neighborhoods where everyone can thrive. This means investing in infrastructure that supports public health, emergency preparedness, and community cohesion—such as safe transportation networks, green spaces, and climate-ready housing.

Community insights shaped this plan to reflect both the City's values and its capacity to lead with innovation and compassion. Implementation of this plan will be a shared journey, one that builds trust and resilience through collective action.

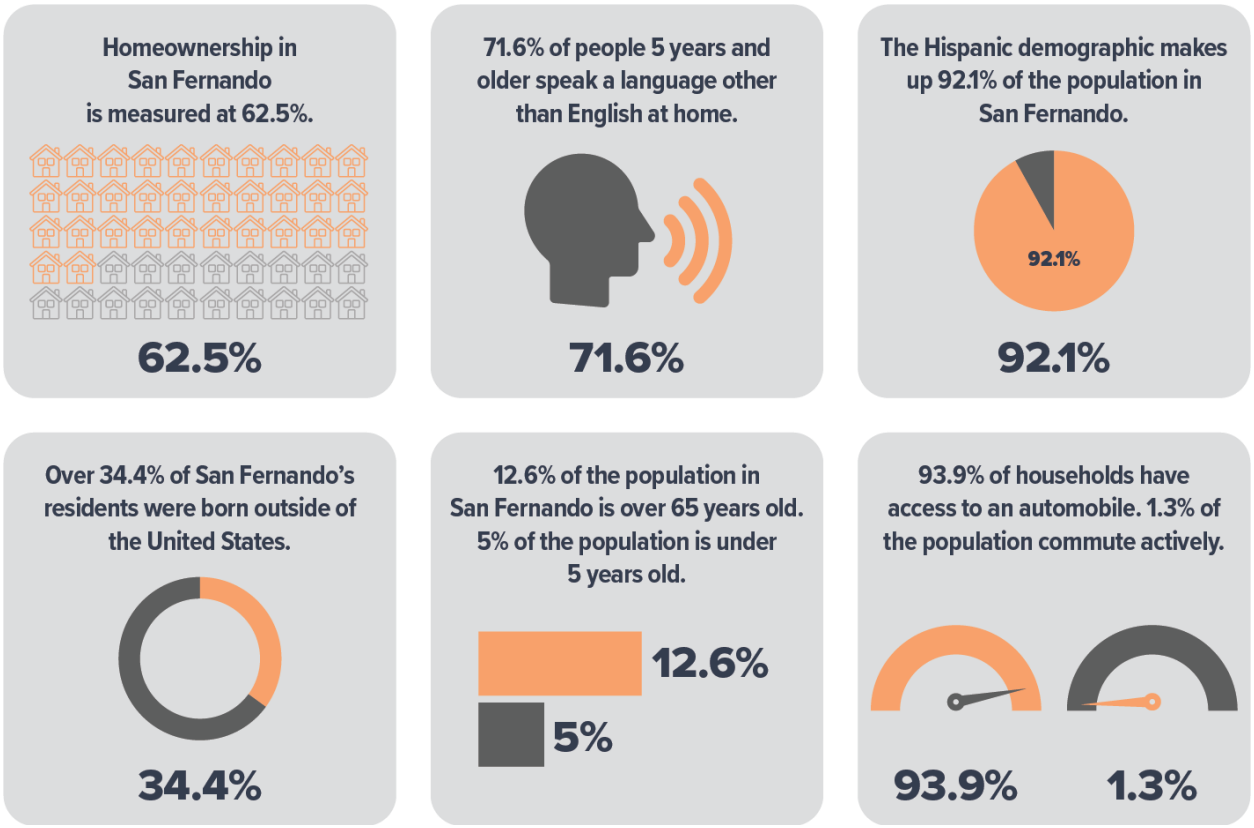
C. OVERVIEW OF SAN FERNANDO

Situated in northeast Los Angeles County, the City of San Fernando is a small and vibrant community with a rich cultural identity and deep historical roots. The City exists within the ancestral and unceded homelands of the Fernandeño Tataviam Band of Mission Indians, a sovereign nation whose enduring cultural presence continues to shape the region today. San Fernando recognizes the Tribe's sovereign history and acknowledges that City boundaries encompass unceded Tribal land. Notably, one of the largest concentrations of Fernandeño Tataviam citizens resides within the City, and San Fernando actively works in partnership with the Tribe to keep its cultural history vibrant and alive through ongoing agreements and collaborative initiatives. This cultural and historical context provides an essential foundation for understanding San Fernando's present-day community and planning priorities

As a city with a population of approximately 24,000, San Fernando holds a unique place within the larger San Fernando Valley, blending its historical roots with a forward-looking, diverse community. San Fernando is a predominantly Latino community, with over a third of community members born outside the U.S., and

most of whom speak a language other than English at home. [1] The city also has a slightly older population than the state average, as shown in Figure 1.

Figure 1 Population Demographics in San Fernando



Source: U.S. Census Bureau, City of San Fernando. For more information, please click here.

San Fernando primarily supplies its water via local groundwater and maintains emergency connections with Metropolitan Water District (MWD) and Los Angeles Department of Water and Power (LADWP), in extreme emergencies.[2] Electricity in the city is provided by Southern California Edison (SCE) and natural gas is provided by the Southern California Gas Company (SCG or SoCalGas). Wastewater services are managed by the City in coordination with the Los Angeles County Sanitation District, providing safe and efficient treatment. Solid waste collection, including recycling and organics, is contracted through a franchised waste hauler, helping the City meet state-mandated diversion goals.

Transportation in San Fernando is primarily car-dependent, though the City is actively working to enhance mobility options. Regional transit services like Metro buses and trains, including the nearby Metrolink Sylmar/San Fernando Station, provide connections across the San Fernando Valley and beyond. The San Fernando Shuttle provides a vital local transit option, linking neighborhoods with schools, parks, downtown, and regional transit hubs within San Fernando. The City also continues to improve pedestrian and cycling infrastructure to support safe and sustainable travel alternatives. San Fernando's compact, walkable layout supports its ongoing efforts to integrate sustainability into urban design. Investments in shaded sidewalks,

[1] U.S. Census. QuickFacts: San Fernando city, California; United States. Accessed April 2025.

[2] Annual Water Quality Report. Reporting Year 2024. https://ci.san-fernando.ca.us/wp-content/uploads/2025/07/2025-Annual-Water-Quality-Report-ENG.pdf. Accessed November 2025 https://ci.san-fernando.ca.us/wp-content/uploads/2025/07/2025-Annual-Water-Quality-Report-ENG.pdf. Accessed November 2025

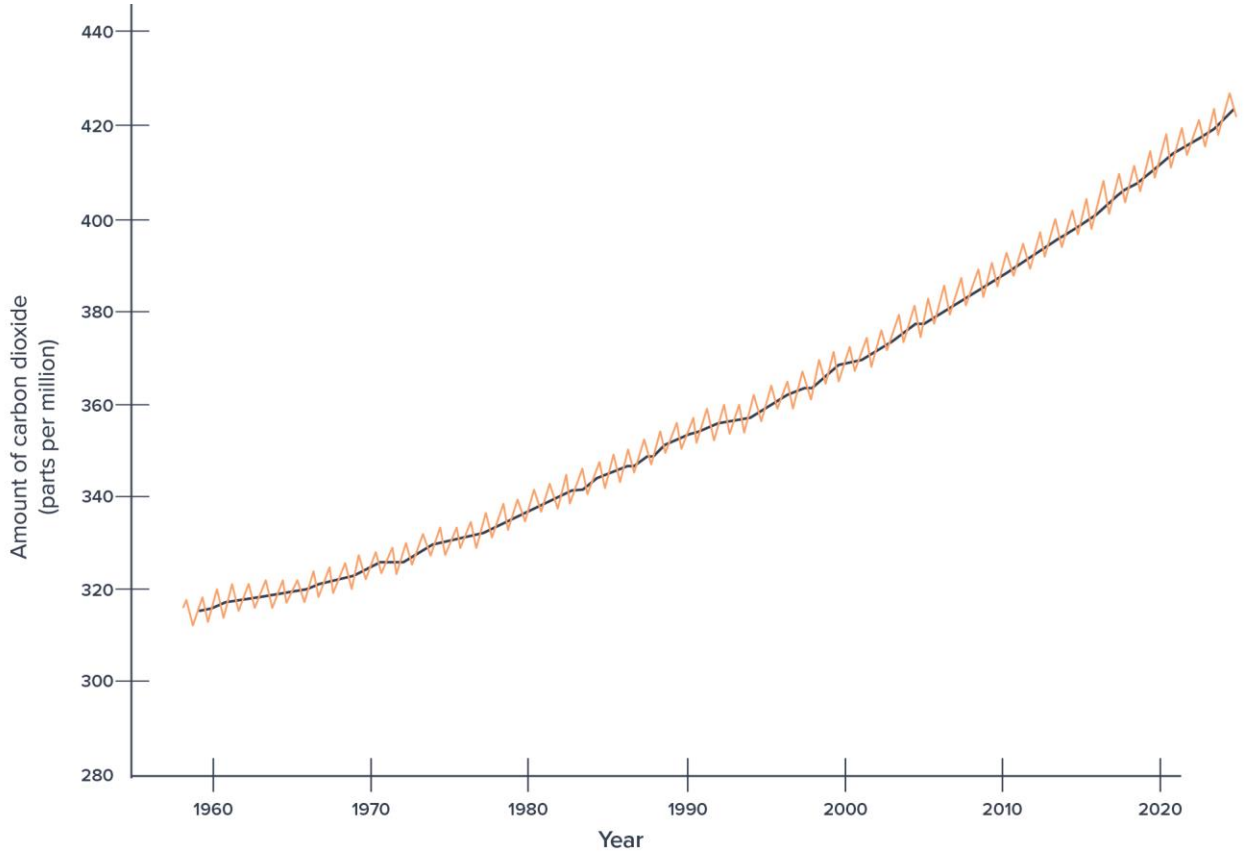
safer bike lanes, and improved crosswalks continue to promote active transportation and equitable access to mobility.

The City also maintains a strong network of parks and open spaces, offering the community accessible recreation, shade, and gathering areas. These green spaces not only strengthen community connections but also provide vital environmental benefits such as cooling, stormwater management, and improved air quality which are key components of San Fernando's long-term climate resilience. The systems-based approach discussed in the Climate Action and Resilience Strategies section integrates environmental and social factors into climate strategies. These efforts support both immediate needs and long-term resilience, advancing sustainable and equitable outcomes for the community and the environment.

D. CLIMATE CHANGE OVERVIEW

Since the mid-20th century, the science behind climate change has become well established. The natural greenhouse effect, essential for keeping Earth's climate stable, relies on certain gases in the atmosphere to trap heat from the sun. Yet, human-driven activities like fossil fuel combustion and large-scale deforestation, particularly since the onset of the industrial era, have drastically increased the concentration of these gases. Atmospheric carbon dioxide, for example, has surged from a historical range of 200 to 280 parts per million to over 400 parts per million within the last hundred years, as illustrated in Figure 2, surpassing any levels recorded in the past 800,000 years. This buildup of greenhouse gases enhances heat retention in the atmosphere, contributing directly to global temperature rise. The overwhelming majority of climate scientists, more than 97 percent, agree that this warming trend is primarily the result of human activity.

Figure 2 Atmospheric Carbon Dioxide



Source: National Oceanic and Atmospheric Administration (NOAA), Global Monitoring Lab. For more information, please click here.

Climate change poses a significant threat to both global and local environments, impacting public health, natural resources, infrastructure, emergency response, and other aspects of society at the local scale. One of the primary indicators of climate change is the increase in global temperatures. Since the turn of the last century, the Earth's average temperature has risen by approximately 2° Fahrenheit (F), with the rate of warming accelerating in recent decades.[3]

In San Fernando, two primary climate indicators—temperature and precipitation—are expected to change in the following ways:

- **Increasing temperatures:** Average maximum temperatures in San Fernando are expected to rise between 5.3°F and 8.7°F by the end of the century. Average minimum temperatures in San Fernando are expected to rise between 4.8°F and 8.2°F by the end of the century.
- **Decreasing Precipitation:** Mid-century projections predict annual precipitation to decrease about 0.6 inches By the end of the century, annual precipitation is expected to decrease between 0.3 to 0.6 inches below the current 30-year average of 17.2 inches. While average annual precipitation is not expected to change significantly, precipitation will likely fall in more intense storms within a shorter wet season.

[3] https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature

Climate hazards in San Fernando expected to change include:

- **Extreme Heat:** Extreme heat is expected to affect all of San Fernando, with greatest impacts to vulnerable population groups. Days over 101.7°F are projected to increase by 36 days by the end of the century and occur during a wider range of months from February to December. The largest increases in the Los Angeles region for extreme heat events are projected for the San Fernando Valley.
- **Drought:** The City of San Fernando is expected to experience increased drought conditions through the end of the century. There is increased likelihood that low precipitation years will coincide with above-average temperature years. The average annual maximum length of dry spell is projected to increase by 19 days by the end of the century.
- **Stormwater Flooding:** Stormwater systems are designed for a certain rain event based on historical averages. With climate change, the stormwater system could be more frequently overwhelmed when events occur that exceed the storm year design. The frequency of atmospheric river events may increase in the future with some locations in City of San Fernando and the Los Angeles region experiencing 25–30 percent increases in the wettest annual day.
- **Poor Air Quality:** Climate change may lead to a decline in air quality regionally, as well as throughout the City of San Fernando. Air quality is expected to worsen in and around the Los Angeles region due to extended droughts, more frequent wildfires, increased ambient temperature, and sporadic natural filtrations of wind.

A detailed vulnerability analysis for the City of San Fernando can be found in the Climate Change Vulnerability section, with the full technical report in Appendix C, Climate Change Vulnerability Assessment.

CALIFORNIA REGULATORY FRAMEWORK

The CARP builds on decades of progressive local, regional, and statewide efforts to reduce GHG emissions, enhance community resilience, and promote environmental justice. While the CARP outlines strategies tailored to San Fernando's scale, character, and priorities, it also reinforces consistency with broader regulatory frameworks, confirming alignment with California's overarching climate goals and regional sustainability mandates. Additional details on relevant legislation and regulatory programs are provided in Appendix A, California Regulatory Framework.

STATE FRAMEWORK

California continues to lead global climate action through landmark policies that establish ambitious emissions and resilience targets:

- Assembly Bill (AB) 32 (Global Warming Solutions Act of 2006), Senate Bill (SB) 32, and AB 1279 set the pathway toward statewide carbon neutrality by 2045.
- SB 350 (Clean Energy and Pollution Reduction Act) and SB 100 (100% Clean Energy Act) accelerate the transition to renewable and zero-carbon electricity.
- SB 379 (2015) requires local governments to integrate climate adaptation and resilience strategies into their General Plans, including vulnerability assessments for climate hazards such as flooding and wildfire.
- AB 2684 (2024) strengthens these requirements by mandating local updates on extreme heat mitigation and resilience planning within Safety Elements.

REGIONAL FRAMEWORK

The CARP aligns with regional strategies led by the South Coast Air Quality Management District (SCAQMD), the Southern California Association of Governments (SCAG), and Los Angeles County:[4]

- SCAQMD rules (e.g., 2202 and 2702) and the 2022 Air Quality Management Plan support emission reductions from transportation and industry.
- SCAG's Connect SoCal 2024 and Regional Climate Adaptation Framework promote compact, transit-oriented growth and regional resilience strategies that mirror the CARP's Mobility and Land Use system.
- The OurCounty Sustainability Plan (2025) and LA Metro Climate Action Plan (2019) reinforce climate equity, clean mobility, and infrastructure resilience—core principles embedded throughout the CARP.
- Adopted in 2025, the LA County Cooling Ordinance limits indoor temperatures in rental units to 82°F to protect tenants from extreme heat. It requires landlords to provide safe cooling systems and phases in compliance based on property size, with full implementation by 2027 for large properties and 2032 for small landlords.

LOCAL FRAMEWORK

At the city level, the CARP integrates and amplifies existing planning and policy efforts:

- The General Plan establishes the foundation for sustainable land use, transportation, housing, and hazard mitigation.
- The Urban Forest Management Plan[5] (2024) and Tree Preservation Policy[6] (2025) advance equitable greening and urban-heat reduction goals.
- The Urban Water Management Plan[7] (2020) guides sustainable water supply, groundwater management, and drought preparedness.
- The Corridors Specific Plan[8] (2017), Safe and Active Streets Implementation Plan[9] (2022), and Downtown Master Plan promote compact, walkable, and transit-oriented design.
- The Parks & Recreation Master Plan[10], Regional Park Infiltration Project[11], and Strategic Climate Resilience Goals[12] (2022–2026) expand green infrastructure, renewable energy, and preparedness initiatives.

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[4] While county policies do not directly apply to the City's operations or fall under its direct jurisdictional authority, the City recognizes that it is located within the County of Los Angeles and is therefore considering the broader regional implications and alignment.

[5] Urban Forest Management Plan: https://ci.san-fernando.ca.us/wp-content/uploads/2024/10/Adopted-Urban-Forestry-Management-Plan.pdf

[6] Tree Preservation Policy: https://ci.san-fernando.ca.us/wp-content/uploads/2025/03/CC-Reso-No-8371-Approving-Tree-Preservation-Policy-3-17-2025.pdf

[7] Urban Water Management Plan: https://ci.san-fernando.ca.us/wp-content/uploads/2021/06/San-Fernando_2020-UWMP_Public-Draft_2021-06-02.pdf

[8] Corridors Specific Plan: https://ci.san-fernando.ca.us/wp-content/uploads/2020/01/San-Fernando-Corridors-Specific-Plan-1.pdf

[9] Safe and Active Streets Implementation Plan: https://ci.san-fernando.ca.us/wp-content/uploads/2022/01/San-Fernando-Plan_01032021.pdf

[10] Parks & Recreation Master Plan: https://ci.san-fernando.ca.us/wp-content/uploads/2023/01/951-01-Park-and-Rec-Master-Plan-Final-Report_112817.pdf

[11] Regional Park Infiltration Project: https://ci.san-fernando.ca.us/sf-regional-park-infiltration-project/

[12] Strategic Climate Resilience Goals: https://ci.san-fernando.ca.us/wp-content/uploads/2024/12/Strategic-Goals-FY-2022-2026-Adopted-2-13-2024.pdf

- The City's Community Engagement Guidelines[13] (2023) establish a common understanding of and commitment to community engagement in all projects, programs, and policies.

Together, these frameworks create a unified foundation for climate action. The CARP translates state and regional priorities into locally relevant strategies, positioning San Fernando as a leader in equitable, community-driven resilience.

E. COMMUNITY ENGAGEMENT

Community engagement was foundational to the development of the CARP. Through inclusive outreach efforts community members identified priorities, established equity principles, and directly informed strategies in the plan.

ENGAGEMENT APPROACH

> ***"Overall, the valley needs more safe shaded stops, paths, and connected infrastructure to make it quicker and more convenient to take the bus or train."***
>
> ***– Community Member***

In partnership with Climate Resolve, Pacoima Beautiful, and the Fernandeño Tataviam Band of Mission Indians (FTBMI), the City hosted a total of 17 events across the community, as summarized in Table 1. Events were open to community members and advertised, in part via the City and project partner's (i.e., Climate Resolve and Pacoima Beautiful) social media pages. The engagement approach focused on creating equitable opportunities for the community to participate through a variety of events and formats. These included community meetings, workshops, walkshops, a virtual survey, an Advisory Committee, and tabling at existing City-run events such as the San Fernando Mile, Spring Jamboree, and Movies in the Park. Additionally, FTBMI conducted a workshop for Tribal citizens to present the plan elements and obtain early feedback on needs and input on climate resilience strategies. The final plan was also be presented to the Tribal community for review and input, in January. At each community event, community members received practical guidance on reducing energy use and accessing rebates and sustainability programs, along with information on how to stay involved in future implementation efforts and potentially co-lead neighborhood resilience initiatives. Additionally, food was provided, and community members were invited to participate in raffles and other giveaways.

In addition to engagement with the community, the CARP was also presented to the Planning and Preservation Commission and City Council for initial feedback in September 2025. The measures and actions in the CARP were refined based on feedback received during the Planning and Preservation Commission and City Council meetings and the updated draft will be presented to the Planning and Preservation Commission in December 2025, with the CARP going to City Council for a follow-up study session in April 2026.

[13] Community Engagement Guidelines: https://ci.san-fernando.ca.us/wp-content/uploads/2023/07/Community-Engagement-Framework-2023.pdf

Table 1 Community Events and Public Meetings

Event Type	Topic	Audience	Date/Location
City Council Meeting	Background Analysis on CARP	City Council and community members	February 20, 2024, City Council Chambers
Planning 101 Series, Workshop No. 1	Introduction to urban planning and climate adaptation	Community members	September 28, 2024, San Fernando Recreation Park
Community Meeting No. 1	Introduction to the CARP and General Plan Elements as well as a review of existing conditions and high-level opportunities to facilitate discussion		November 16, 2024, Las Palmas Park, Arts & Crafts Room
Tribal Community Meeting No. 1	Introduction to the CARP and General Plan Elements as well as a review of existing conditions and high-level opportunities to facilitate discussion	Tribal Community Meeting (invitation only)	November 14, 2024 (virtual)
Advisory Group Recruitment	Recruitment for advisory group was held virtually	Community members	Fall 2024 - Virtual application with follow-up phone interviews
Community Survey	Collect and gather feedback on existing conditions and perceptions, as well as identify hurdles associated with implementation and solutions that may be implemented to address community concerns	Community members	October 2024 – July 2025 (virtual, with physical voting boards at all in-person events)
Advisory Group Meeting No. 1	review of existing conditions and high-level opportunities to facilitate discussion	Advisory Group	January 7, 2025 (virtual)
Advisory Group Meeting No. 2	Introduction to equity guardrails and facilitated discussion to receive feedback in order to refine and update	Advisory Group	February 13, 2025 (virtual)
Walkshop No. 1	Community tour & data grounding	Community members	February 22, 2025, Layne Park (120 N Huntington St.)
San Fernando Mile Run	Collect and gather feedback on existing conditions and perceptions, as well as identify hurdles associated with implementation and solutions that may be implemented to address community concerns	Community members	March 1, 2025, One-Mile Start Line: Maclay Ave & Eighth St
Advisory Group Meeting No. 3	Review updated equity guardrails	Advisory Group	March 25, 2025 (virtual)
Community Meeting No. 2	Feedback collection on measures and actions	Community members	April 3, 2025, Las Palmas Park, Arts & Crafts Room
Spring Jamboree	Feedback collection on measures and actions	Community members	April 19, 2025, Las Palmas Park
Advisory Group Meeting No. 4	Feedback collection on measures and actions	Advisory Group	May 14, 2025 (virtual)
Movies in the Park	Feedback collection on measures and actions	Community members	July 25, 2025, Pioneer Park
Planning and Preservation Commission Meeting	CARP status update and introduction to measure and action framework	Planning and Preservation Commission and community members	September 9, 2025, City Council Chambers
City Council Meeting	CARP status update and introduction to measure and action framework	City Council and community members	September 15, 2025, City Council Chambers

Event Type	Topic	Audience	Date/Location
Tribal Community Meeting No. 2	Introduction to the CARP and General Plan Elements as well as a review of existing conditions and high-level opportunities to facilitate discussion	Tribal Community Meeting (invitation only)	January 2026 (virtual)
Planning and Preservation Commission Meeting	CARP review	Planning and Preservation Commission and community members	January 12, 2026, City Council Chambers
City Council Meeting	CARP review	City Council and community members	January 20, 2026, City Council Chambers

In total, eight community events were hosted, four Advisory Group meetings, and five public hearings. During this process, the City gained valuable feedback including information on the strategies which the community would like to see centered in the plan. A summary of each of the events hosted is provided below with more details in Appendix B, Community Engagement Summary

PLANNING 101 SERIES

The first official community event hosted as part of the CARP development process was a planning workshop to empower and educate San Fernando residents, particularly low-income and Black, Indigenous, and People of Color (BIPOC), with knowledge of urban planning principles to advocate for a more equitable and sustainable built environment in the city. During the event, participants collaborated in small groups to share community priorities, identify local challenges, and propose ideas for improving sustainability, mobility, and quality of life in San Fernando.

> ***"The city of San Fernando has been performing well overall, showing growth and positive development. However, my biggest concerns are safety and adequate funding, as both are crucial to maintaining progress and ensuring the well-being of the community."***
> ***– Community Member***

ADVISORY GROUP

The Community Advisory Group (CAG) was facilitated by Climate Resolve and consisted of eight community members who contributed local expertise to the planning process, offering feedback through structured engagement activities. Their input helped shape the CARP, confirming strategies that reflect community realities, elevate resident priorities, and embed equity into decision-making and resource allocation. Specifically, the CAG provided direct review of and feedback on the equity guardrails to serve as guiding principles for the CARP's measures and actions. CAG members were selected through a formal application and interview process that garnered over 20 applications. The intent of the CAG was to include community members with various lived experiences including diversity in age, gender and spoken language.

WORKSHOPS

Throughout the course of the project development process, a total of four community meetings were hosted. Two of the four meetings were held at parks in the city and open to all community members; these sessions were hosted by Climate Resolve, who facilitated discussions and guided interactive activities. The other two meetings were hosted by FTBMI and only included Tribal members. The first set of workshops were developed to provide the community with a broad understanding of the project and facilitate conversations about how the plan should be shaped to best address the community's needs. These workshops were

hosted in Fall 2024, with the same information shared at the community workshop and the Tribal event. The second community workshop was hosted in Spring 2025 to provide an update on the project status and facilitate a discussion around specific measures and actions that the plan could include. FTBMI hosted a second workshop in January 2026 with the Tribal community to discuss the final plan once it is available for public input. Images from the workshops are shown in Figure 3 and Figure 4.

Figure 3 Community Workshop #1 – Round Table Discussion

Figure 4 Community Workshop #2 – Presentation

WALKSHOPS

A series of “walkshops” were conducted throughout San Fernando to assess existing mobility patterns, analyze heat impacts across different areas, and provide input on lived experiences. These on-the-ground tours were led by Climate Resolve and attended by all project partners. They served as a tool to identify climate-related vulnerabilities such as heat islands, flood-prone areas, and gaps in green infrastructure while engaging community members in the planning process. The insights gathered helped highlight opportunities for climate adaptation and urban resilience improvements. Community members actively contributed through citizen science, using tools such as infrared cameras and pairing the scientific data with their own lived experience.

Figure 5 Community Members Participating in Walkshop

COMMUNITY POP-UP EVENTS

Thousands of community members attend San Fernando’s cultural celebrations, seasonal festivals, and local events each year. To harness this energy and foster inclusive participation, representatives from the City hosted “pop-up” booths at existing events, meeting community members where they already gather. This approach created organic, low-barrier opportunities for community members to engage with the planning process in familiar and welcoming settings. Booths were set up at the San Fernando Mile, Spring Jamboree, and a Movies in the Park event. At each event, representatives from the City shared updates on the Plan’s development, including key milestones, emerging themes, and the timeline for adoption. Informational materials were provided in both English and Spanish for accessibility and transparency.

In addition to sharing project status, the team actively gathered community feedback through interactive boards, surveys, and one-on-one conversations. This input directly informed the drafting of climate measures and actions so that the CARP reflects the lived experiences, priorities, and ideas of San Fernando residents. The booths also served as a resource hub, offering tools and guidance for immediate

climate action. Community members received information on how to reduce energy use, access rebates for home upgrades, and participate in local sustainability programs. Longer-term resources were also shared, including pathways for community involvement in future implementation efforts and opportunities to co-lead neighborhood resilience initiatives.

By embedding engagement into beloved community traditions, the City confirmed that diverse voices were included in shaping a resilient, equitable future for San Fernando.

Figure 6 Voting in Action at the Spring Jamboree

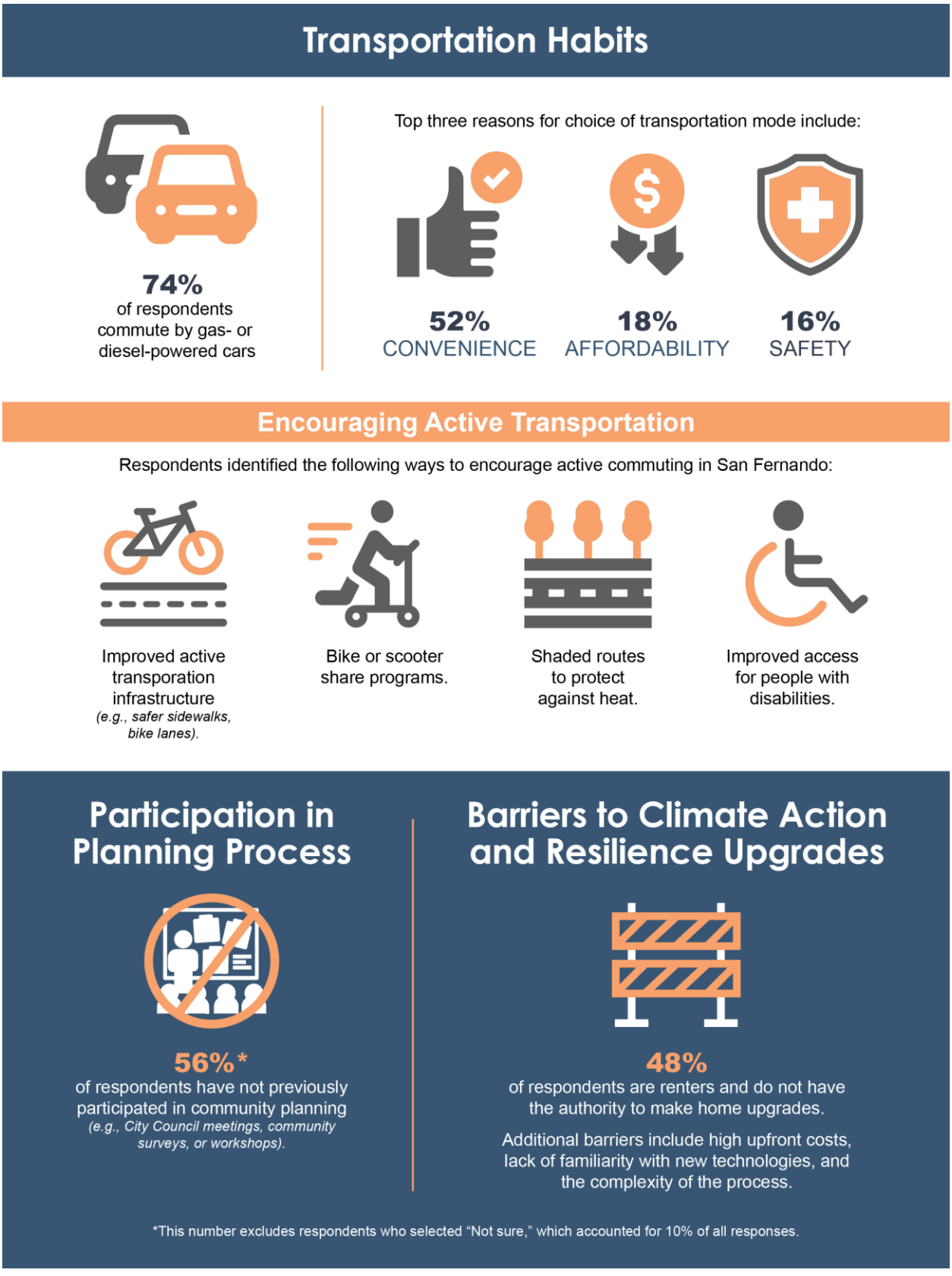
Figure 7 Spring Jamboree Booth and Voting Boards

COMMUNITY SURVEY

A virtual survey was hosted concurrently while the in-person and virtual events were taking place to provide another platform for community members to provide feedback on the CARP. In total, over 175 responses were received via the virtual survey with feedback provided in both Spanish and English. Based on the survey results, the majority (over 80 percent) of community members in San Fernando are very concerned or somewhat concerned about climate change. In general, community members are most concerned about extreme heat and poor air quality. The climate adaptation strategy that the community believed to be most important is related to preparing for extreme heat and enhancing planning and response plans. In alignment with the greatest opportunity identified, the City has included a "Cornerstone" measure in the Climate Action and Resilience Strategies section, which directly aligns with and supports this community goal.

Key highlights from the survey are shown in Figure 8.

Figure 8 Key Highlights from the Community Survey



F. CLIMATE CHANGE VULNERABILITY

VULNERABILITY AND RESILIENCE

Implementing effective climate resilience strategies is essential in addressing our changing climate. To identify and implement strategies, the City must first understand our risks and stressors. This chapter summarizes San Fernando's specific climate vulnerabilities, while the strategies designed to prepare the community for a future shaped by climate change are summarized in the Climate Action and Resilience Strategies section.

Climate change will damage infrastructure and disrupt natural ecosystems, leading to costly repairs and loss of biodiversity, while disproportionately affecting vulnerable populations who have fewer resources to adapt. These communities are more likely to experience health risks, economic strain, and displacement due to extreme weather events and changing environmental conditions. While climate change impacts will vary by location, in San Fernando, climate change is expected to result in hotter days and nights, increase the urban heat island (UHI) effect, increase the intensity and frequency of storms leading to flooding, increase the duration of drought, and worsen air quality.

A Climate Change Vulnerability Assessment (CCVA)[14] was conducted to evaluate the potential impacts of climate change on critical facilities (such as government facilities, healthcare facilities, emergency responders, schools, water supply infrastructure, and transportation infrastructure) and community members. Identified vulnerabilities were determined based on the exposure of people and critical facilities to different climate hazards and the community's adaptive capacity, or ability to cope with and adjust to the impacts of climate change. The gaps identified between projected climate change impacts and adaptive capacity are the community's major vulnerabilities. This CARP includes strategies to address major vulnerabilities by climate-proofing homes and critical facilities, improving evacuation and health alert messaging to the community, establishing resilience centers, increasing tree canopy, and more.

CLIMATE HAZARDS

As stated in the Intergovernmental Panel on Climate Change (IPCC), human-caused climate change is already affecting many weather and climate extremes in every region across the world.[15] San Fernando is not exempt from these impacts and is increasingly facing a variety of climate hazards due to the effects of climate change, including:

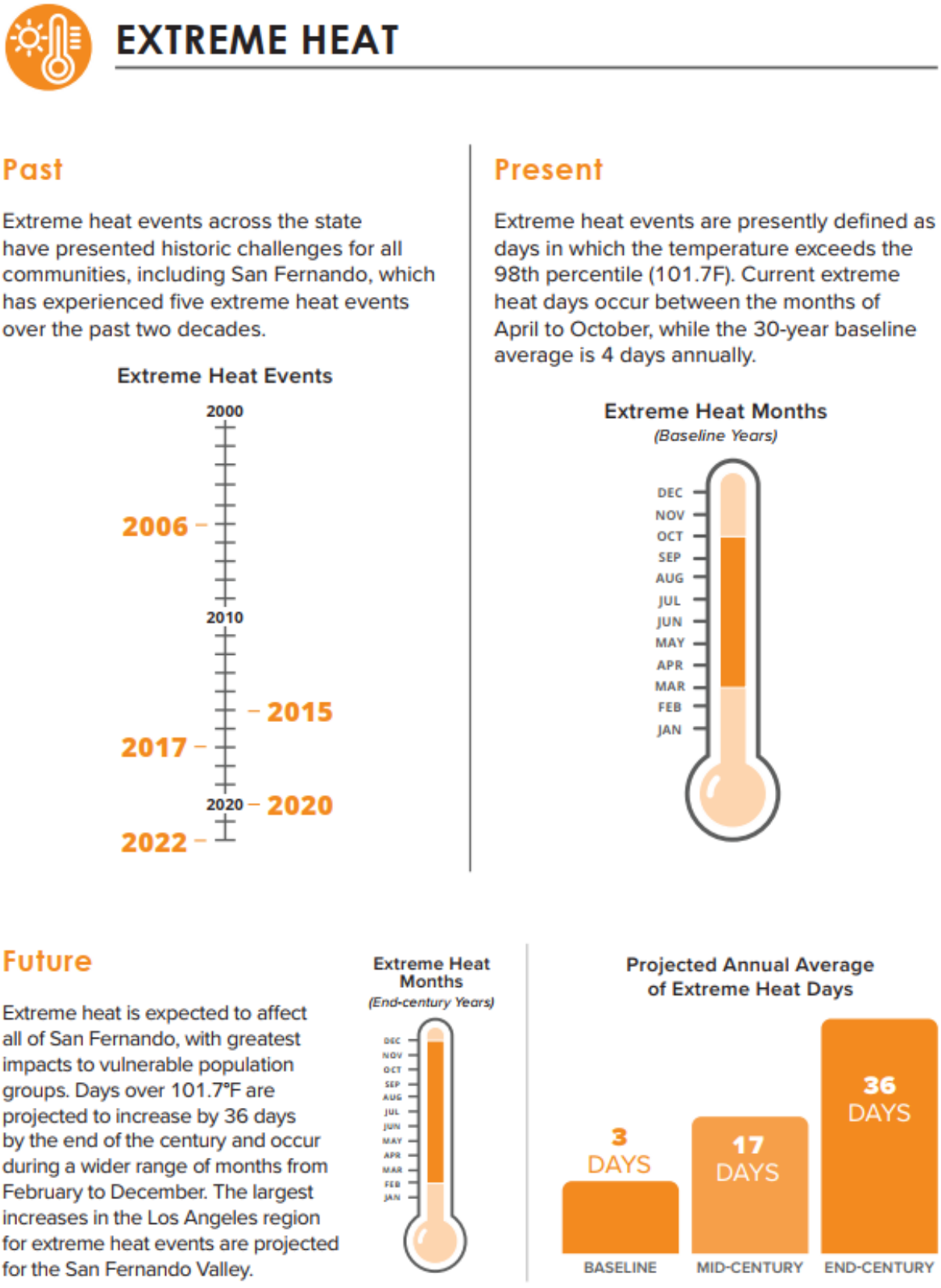
- **Extreme Heat:** San Fernando will face more extreme heat days and frequent heat waves, posing health risks to vulnerable populations like older adults and under-resourced individuals. According to the United States Environmental Protection Agency, extreme heat is a leading weather-related killer in the U.S.[16], even though it is largely preventable. The city's energy and water systems may also be strained by increased demand for cooling and water. More details on extreme heat in San Fernando can be found in Figure 9 below.

[14] The full CCVA can be found in Appendix C Climate Change Vulnerability Assessment.

[15] Intergovernmental Panel on Climate Change. 2023. Climate Change 2023 Synthesis Report. Available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_LongerReport.pdf. Accessed in December 2024.

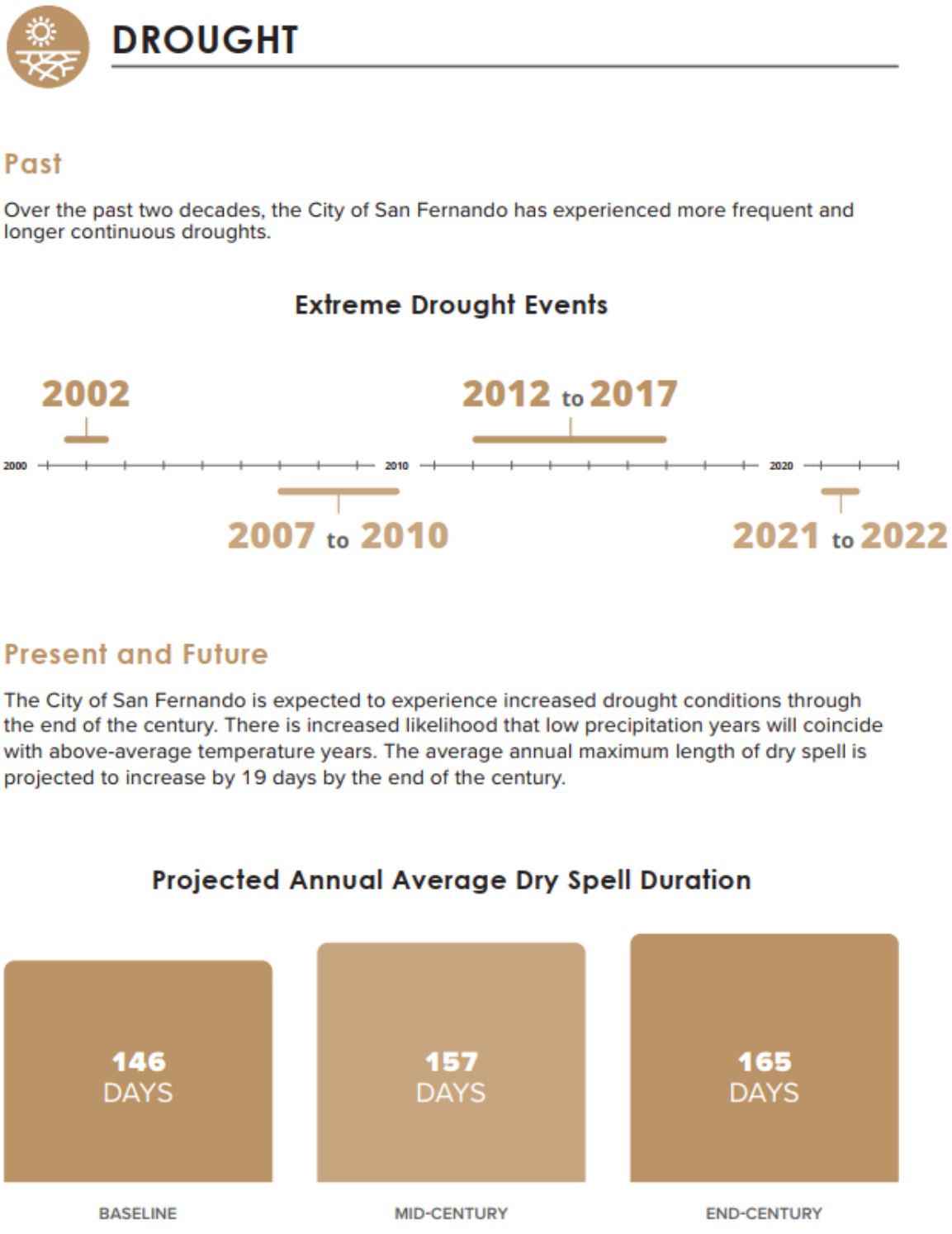
[16] U.S. EPA: https://www.epa.gov/climate-indicators/climate-change-indicators-heat-related-deaths

Figure 9 Extreme Heat in San Fernando



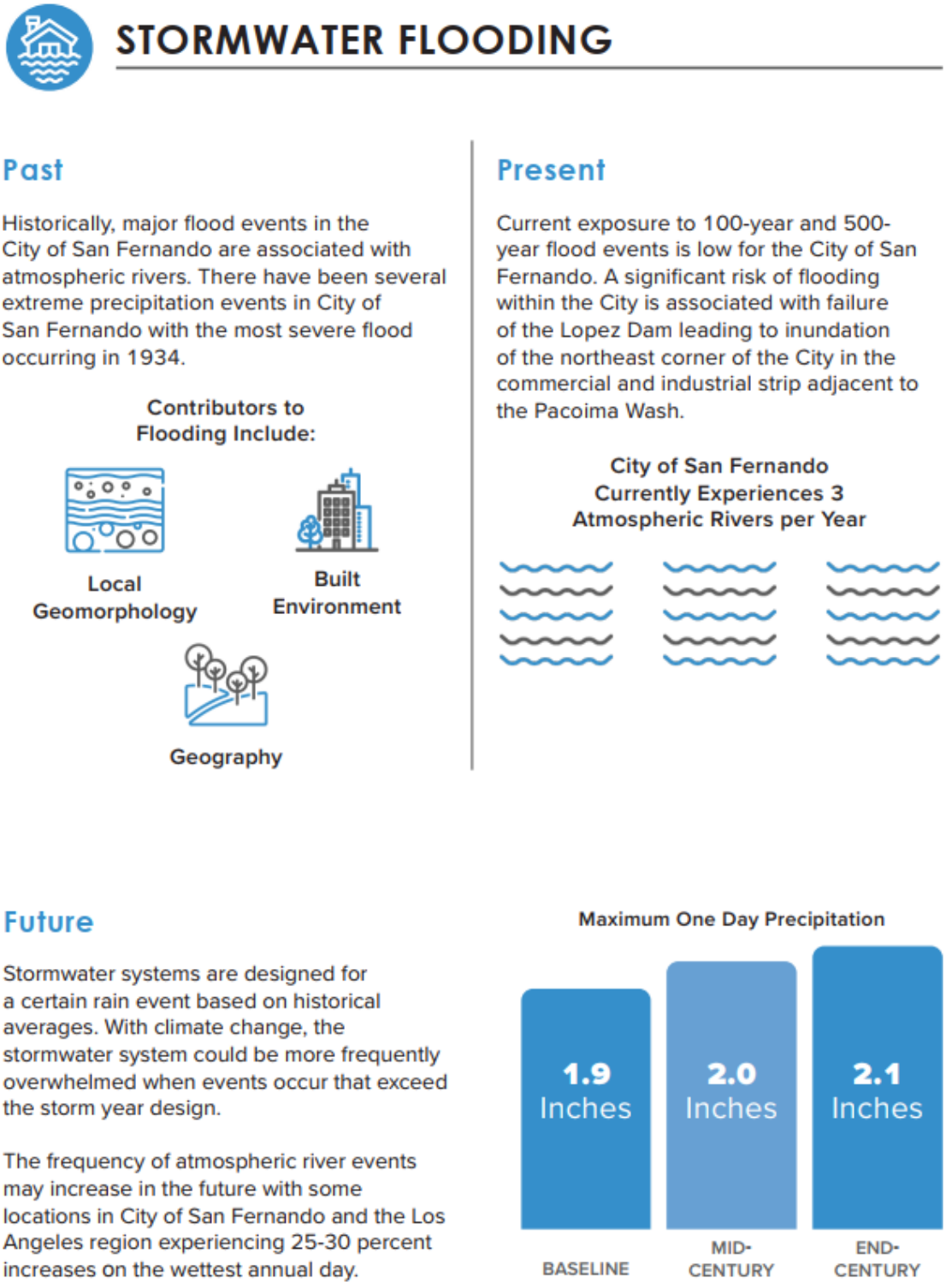
- **Drought:** San Fernando faces significant drought risks, impacting water availability and water quality. Prolonged dry periods may stress the city's water supply, affecting natural and recreational resources, increasing irrigation needs, and disrupting habitats. For community members, drought conditions can also lead to higher utility costs and limited outdoor water use. More details on drought conditions in San Fernando can be found in Figure 10 below.

Figure 10 Drought Conditions in San Fernando



- **Stormwater Flooding:** More intense and frequent storms are expected, increasing the risk of stormwater flooding. This can overwhelm drainage systems, causing property damage, transportation disruptions, and health hazards from contaminated floodwaters. More details on stormwater flooding in San Fernando can be found in Figure 11 below.

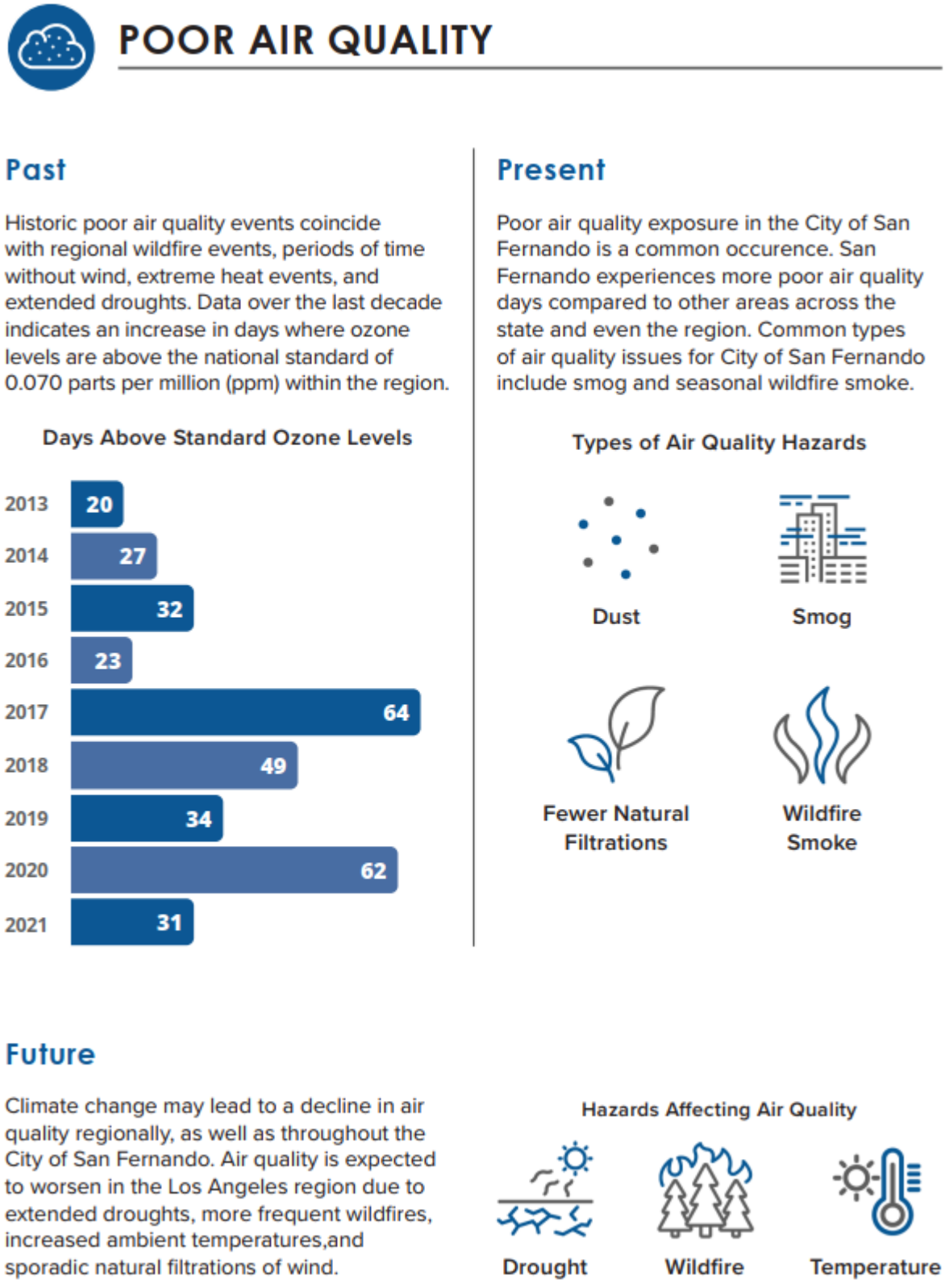
Figure 11 Stormwater Flooding in San Fernando



- **Poor Air Quality:** Air quality in San Fernando ranks among the worst in California, placing the city in the 90th percentile for ozone exposure within the state.[17] Air quality in San Fernando is primarily impacted by internal combustion engine (ICE) vehicle emissions and wildfire smoke. Higher temperatures accelerate ozone formation, while extended drought conditions reduce atmospheric moisture and further degrade air quality—both climate-driven factors that exacerbate existing health risks. Poor air quality disproportionately affects community members already facing higher exposure to pollution, increasing the likelihood of hospital visits and long-term respiratory and cardiovascular impacts. More details on poor air quality in San Fernando can be found in Figure 12 below.

[17] City of San Fernando Environmental Justice Technical Report. Available at: https://ci.san-fernando.ca.us/wp-content/uploads/2021/12/EJ-Technical-Report_December2021.pdf

Figure 12 Poor Air Quality in San Fernando



These climate hazards highlight the need for robust resilience and mitigation strategies to enhance San Fernando's resilience to the impacts of climate change. See Figure 13 for a summary of the most prominent climate hazards in San Fernando.

Figure 13 San Fernando Climate Hazards

Extreme Heat Risks
San Fernando will face significantly more extreme heat, with days over 101.7°F increasing by 36 annually by century's end. These events will span February to December, with the San Fernando Valley seeing the largest rise in the Los Angeles region.

Growing Drought Conditions
Droughts are projected to intensify, with more frequent overlaps of low precipitation and high temperatures. The longest dry spells could extend by 19 days on average by the end of the century.

Stormwater Flooding Threat
Climate change may overwhelm stormwater systems designed for historical rainfall patterns. Atmospheric river events could increase, raising the wettest day's rainfall by 25–30% in some areas.

Poor Air Quality
Air quality in San Fernando and the wider Los Angeles region is expected to worsen due to prolonged droughts, more wildfires, higher temperatures, and inconsistent wind filtration.

CASCADING IMPACTS

Cascading impacts occur when climate hazards not only directly affect infrastructure or essential services like power and water but also spread to interconnected systems and the people who rely on them. These interconnected impacts can extend beyond a single system or neighborhood, affecting dependent subsystems and populations, as shown in Figure 14 and described in detail below.

Figure 14 Cascading Impacts in San Fernando

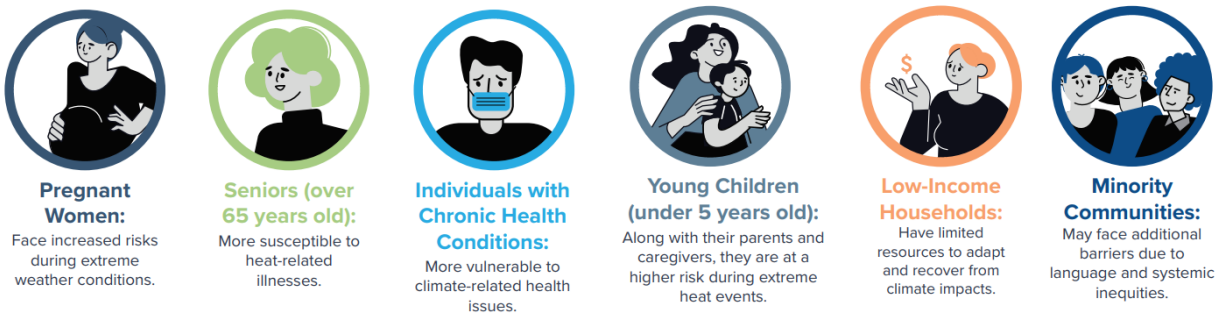
1. Cascading impacts on **communication systems** primarily arise from communication outages, which can complicate evacuations and medical responses, isolate residents, and increase risks for those who rely on hazard information. Areas in San Fernando that are prone to hazards are especially vulnerable to these disruptions, worsening the effects of losing communication infrastructure.
2. Cascading impacts on San Fernando's **water system** can lead to reduced water supply for the community, potentially resulting in higher water rates or limited access altogether. This poses public health concerns for under-resourced individuals who may struggle to afford the increased costs. Moreover, insufficient water impacts the city's tree canopy, which is crucial for mitigating urban heat island effects and managing stormwater.
3. The **electricity system** in San Fernando faces cascading risks from wildfires and extreme temperatures which could result in planned and unplanned power outages. Power outages can disrupt electricity in homes, preventing the use of air conditioning, heating, and medical devices. Poor air quality from wildfires during a power outage can worsen health conditions for vulnerable individuals. Critical services like traffic signals and cell towers, along with facilities lacking backup power, may stop functioning. This can result in heat-related illnesses, food access issues, evacuation challenges, strained emergency services, and increased exposure to climate hazards during heat waves and wildfires.
4. The **natural gas system** in the region is at risk from wildfires, which can damage gas lines and cause leaks and fire hazards. Historical incidents, such as the 2016 Aliso Canyon gas leak, show the potential for temporary closures of gas facilities, revealing vulnerabilities in the region's ability to handle prolonged disruptions to critical energy infrastructure. This could result in direct impacts to San Fernando residents with disruption in natural gas to heat and power homes.
5. Cascading risks in the **transportation system** can lead to resident isolation, hinder emergency response to climate hazards, limit evacuation routes, and may limit a person's ability to get to work, potentially resulting in lost income. These impacts arise from physical damage to local transportation infrastructure due to climate hazards, external factors affecting regional transportation networks, and power outages causing traffic signal failures.

TOP SAN FERNANDO CLIMATE CHANGE VULNERABILITIES

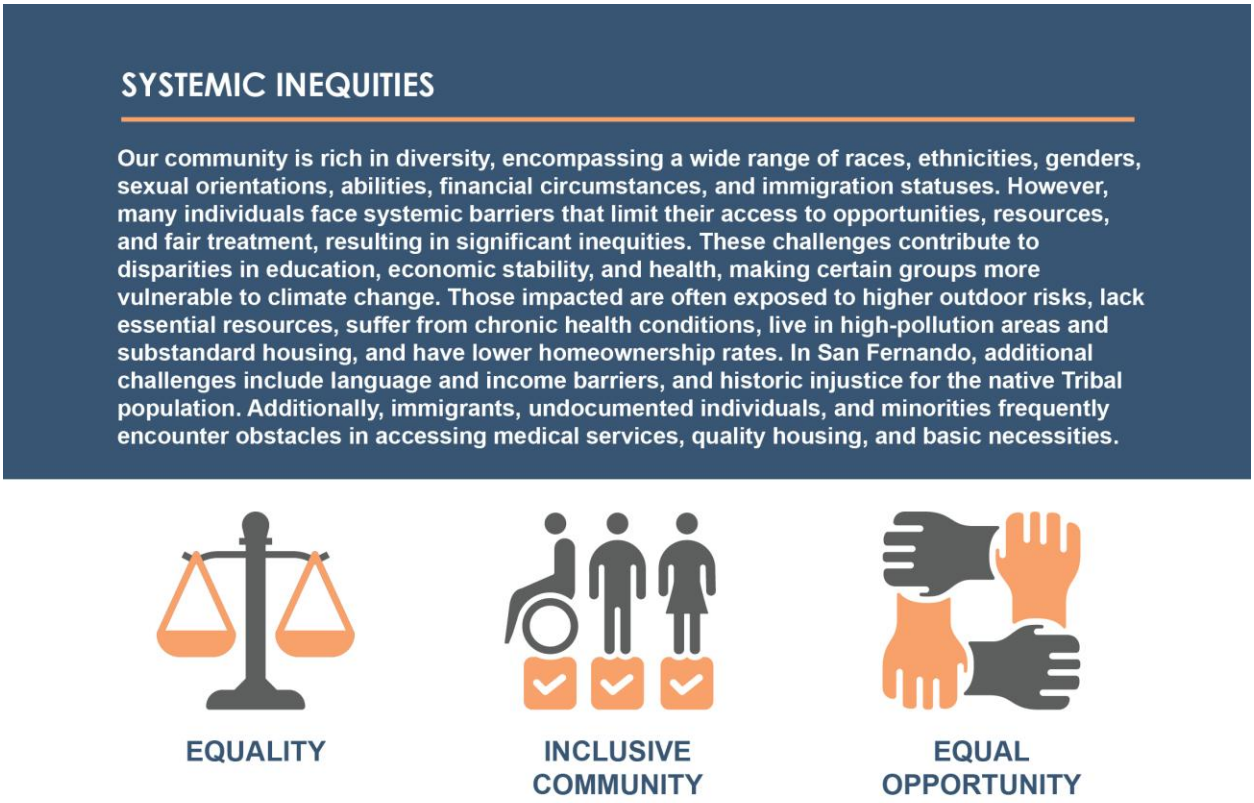
SOCIAL VULNERABILITES

Social vulnerability refers to how climate change impacts different community members. While everyone in San Fernando will be affected by climate hazards, some people are more at risk due to systemic inequities. These individuals will face greater impacts. Some of the most at-risk population groups can be found in Figure 15.

Figure 15 Demographics of At-Risk Populations



San Fernando has some plans and programs in place that protect vulnerable populations against climate hazards, including operating cooling centers and Alert San Fernando, the city's emergency notification system. Additionally, the SCE Medical Baseline Program provides support to individuals with medical needs for electricity. There are limited resources and plans directly increasing the adaptive capacity of San Fernando's vulnerable populations to air quality. For more details on how these areas were identified, please refer to the full CCVA in Appendix C, Climate Change Vulnerability Assessment.



PHYSICAL VULNERABILITES

Physical vulnerability refers to how infrastructure, buildings, and natural and open spaces are susceptible to climate hazards and extreme weather events. Climate change can damage infrastructure and habitats, disrupt services, and limit evacuation and emergency response. The following sections provide a summary of these physical vulnerabilities in San Fernando.

Natural and Recreational Resources

Natural and recreational resources within San Fernando as detailed in the Draft Urban Forest Management Plan, Urban Water Management Plan, and Park & Recreation Master Plan, include groundwater resources, mini parks (Cesar E. Chavez Memorial Park, Kalisher Park, and Layne Park), a neighborhood park (Rudy Ortega Sr. Park), community parks (Las Palmas Park, Pioneer Park, and Recreation Park), natural areas (Pacoima Wash Natural Park), city bikeways, and street trees making up the urban forest. Total acreage of parks can be found in Figure 16. These various resources provide sources of community resilience and recreation to the city. The city currently provides 0.75 acres of parkland space for every 1,000 residents,

which is significantly less than the statewide standard of five acres per 1,000 residents.[18] These resources are spread throughout the city and face various levels of exposure to climate hazards.

Figure 16 Park Acreage in the City of San Fernando

Source: City of San Fernando Park and Recreation Master Plan (2017)

Extreme heat poses a significant risk to urban forest health, stressing street trees and natural areas like Pacoima Wash Natural Park, while drought conditions threaten groundwater availability and the maintenance of park landscapes. Additionally, intensified storm events can lead to flooding and erosion, particularly in natural areas and bikeways, compromising their usability and safety. As these climate hazards intensify, they not only endanger the integrity of these resources but also reduce their ability to provide essential community benefits, such as recreation, shade, and cooling, emphasizing the urgent need for proactive climate adaptation measures and a multi-benefit approach to leveraging infrastructure improvements.

Buildings and Facilities

Climate change is expected to amplify extreme weather and climate hazards in San Fernando. A jurisdiction's vulnerability increases when buildings and facilities are not designed, operated, and/or maintained to function effectively under extreme weather conditions or can be damaged by extreme weather conditions. Due to the roles they play in supporting general community functioning and hazard response, the following buildings and facilities would be particularly important to assess for climate change impacts: municipal buildings, educational facilities, hospitals, residential and commercial development, roadways and transportation facilities, active transportation routes, fire stations, and police stations. Some key buildings and facilities in San Fernando include:

[18] The Quimby Act (California Government Code Section 66477) authorized cities and counties to pass ordinances requiring that developers set aside land, donate conservation easements, or pay fees for park improvements. The goal of the Act was to require developers to help mitigate the impacts of property improvements. The Act gave authority for passage of land dedication ordinances to cities and counties and established a State standard of 5 acres of parkland per 1,000 residents.

- City Hall
- LA County Fire Department Fire Station #74
- San Fernando Police Department
- Educational Facilities
- Hospitals and Medical Centers
- Community Centers/Resources
- Transit Stops

Infrastructure and Critical Services

Within San Fernando, there is a variety of infrastructure and critical services that are vulnerable to climate change. Assets within this category include water services, wastewater, storm drainage and flood protection, solid and hazardous waste and recycling, fire services, emergency services, medical services, utilities and major utility corridors, public transportation, roadways, and active transportation routes. This asset group is sensitive to climate change as the impacts of hazards can affect the ability to provide services and resources, and the infrastructure in place may not be adequately prepared to sustain increasing and compounding hazards. The following public services may be sensitive to the impacts of climate change.

- The City provides all San Fernando residents with potable water sourced from local groundwater wells. Critical water infrastructure includes:
  - Wells
  - Treatment Facilities
  - Pump Stations
  - Distribution Pipeline.
- The San Fernando Public Works Department maintains the City's sewer system.
- The City's wastewater is conveyed to the Hyperion Water Reclamation Plant. The wastewater plant is maintained and operated by the Los Angeles County Sanitation District.
- Stormwater drains in San Fernando are owned and maintained by the Los Angeles County Flood Control District. There are storm drains along the major arterials in the city.
- Southern California Gas Company provides natural gas services to the city.
- Southern California Edison Company provides electricity services to the city.
- The San Fernando Police Department provides police services to the city.
- San Fernando contracts with the Los Angeles County Fire Department for fire services.
- Waste collection is provided by Republic Services.
- San Fernando receives transit services from Mission City Transit Dial-A-Ride vehicles and the Los Angeles County Metropolitan Transportation Authority (Metro) buses.

To enhance resilience under climate change, the City is updating its Water Master Plan to include a Performance and Design Criteria section. These criteria will guide infrastructure upgrades and development review processes to ensure the water system can meet peak demand and fire suppression requirements during extreme heat and drought conditions. This effort complements groundwater sustainability strategies and supports long-term reliability under compounding climate hazards.

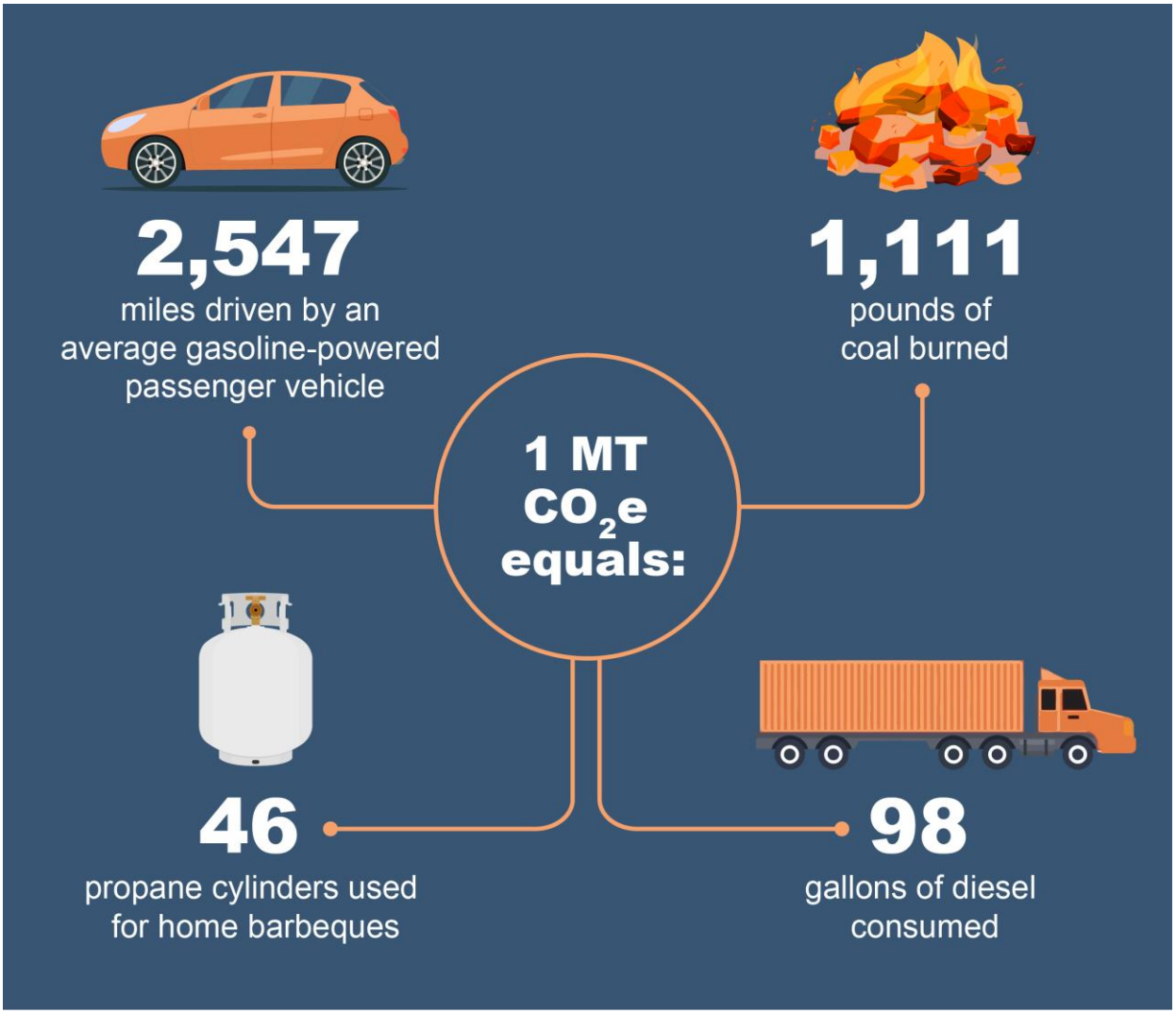
G. GREENHOUSE GAS EMISSIONS ANALYSIS

GREENHOUSE GAS EMISSIONS INVENTORY

A fundamental part of the climate action planning process is the development of a greenhouse gas (GHG) emissions inventory for a specific point in time (i.e., a calendar year). A GHG emissions inventory quantifies emissions from various sectors or categories (e.g., energy, transportation, etc.), which can help guide the development of a CARP by identifying the sources that generate the greatest amount of emissions. As part of the CARP development process, the City of San Fernando completed a GHG emissions inventory for the community and a GHG emissions inventory for municipal operations for the year 2021. The 2021 Municipal GHG Inventory includes emissions associated with municipal facilities and operations. The 2021 Community GHG Inventory includes GHG emissions from activities within city limits that occurred during 2021. It is important to note the Community GHG Inventory includes municipal GHG emissions as a subset within the inventory, while the Municipal GHG Inventory presents only the municipal GHG emissions. As such, the emissions between the two inventories are not additive.

To allow for comparison among GHG emissions sources, all emissions are converted to the equivalent of one metric ton of carbon dioxide, or MT CO_2e. One MT CO_2e is the equivalent of using 113 gallons of gasoline or driving 2,547 miles in a standard combustion vehicle, as shown in Figure 17.

Figure 17 Carbon Dioxide Equivalents



COMMUNITY GREENHOUSE GAS EMISSIONS INVENTORY

The City's 2021 Community GHG Inventory was developed according to the International Council for Local Environmental Initiatives (ICLEI) U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions, Version 1.2. The Community Inventory was conducted in alignment with the most recent available data sources, emission factors, and Global Warming Potentials from Intergovernmental Panel on Climate Change (IPCC) Assessment Report. It covers the relevant emissions sources within the boundary of the City of San Fernando. The inventory thereby reflects emissions over which the City has direct jurisdictional control. In 2021, the San Fernando community emitted approximately 138,990 MT CO_2e. The results of the GHG inventory are summarized in Figure 18 and Table 2.

Figure 18 Community GHG Emissions by Sector

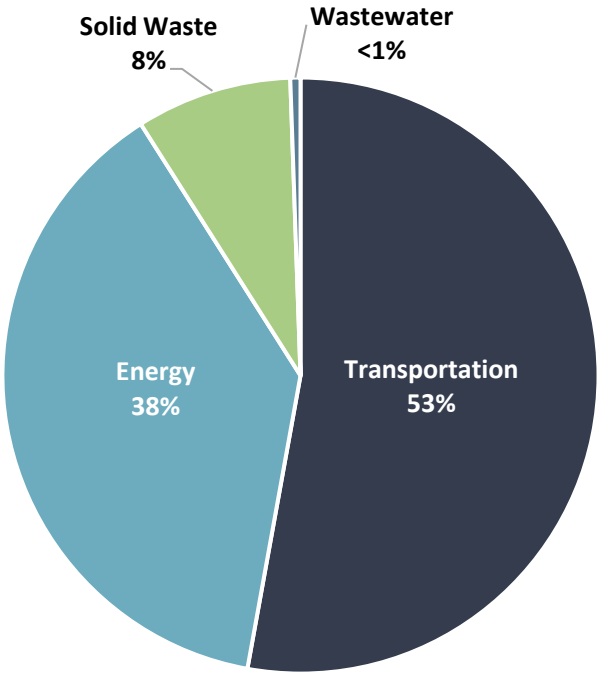


Table 2 Community GHG Emissions by Sector and Subsector

Sector and Subsector	2021 GHG Emissions (MT CO_2e)	Percent of 2021 Emissions (%)
Transportation	**73,460**	**53%**
On-road Passenger Vehicles	55,897	40%
On-road Commercial Vehicles	12,371	9%
On-road Buses	557	<1%
Off-road Equipment	4,634	3%
Energy	**53,018**	**38%**
Residential Electricity	10,262	7%
Nonresidential Electricity	21,634	16%
Residential Natural Gas	12,665	9%
Nonresidential Natural Gas	8,458	6%
Solid Waste	**11,749**	**8%**
Solid Waste	11,749	8%
Wastewater	**763**	**<1%**
Wastewater	763	<1%
Total Emissions	**138,990**	**100%**

The 2021 Community GHG inventory is organized by four primary sectors as shown in Figure 18 and Table 2. The transportation sector is the largest source of GHG emissions, generating approximately 73,460 MT CO_2e, or 53 percent of the total 2021 community emissions. The transportation sector includes passenger and commercial vehicles, public transit, and offroad vehicles and equipment. The energy sector, including electricity and natural gas used within residential and nonresidential buildings, was the second largest source of GHG emissions, generating approximately 53,018 MT CO_2e, or 38 percent of the total 2021 community GHG emissions. The solid waste sector, including the processing and decomposition of waste at landfills outside of San Fernando, accounts for 11,749 MT CO_2e or eight percent of the city's GHG emissions. The collection and treatment of wastewater (763 MT CO_2e) resulted in the remaining GHG emissions. Emissions from the water sector are captured under the building energy sector. Other emissions (e.g., hydrofluorocarbons used in industrial or manufacturing settings) were excluded from this inventory due to jurisdictional control, data availability, or state legislation-related considerations. The included sectors align with U.S Community Protocol best practices.

MUNICIPAL GREENHOUSE GAS EMISSIONS INVENTORY

The City's municipal GHG inventory (2021 Municipal Inventory) was completed using the Local Government Operations Protocol developed by ICLEI, California Air Resources Board, California Climate Action Registry, and The Climate Registry. The Local Government Operations Protocol methodology includes the calculation of GHG emissions which can be attributed directly to the City's operations in the given inventory year. The municipal inventory allows the City to track its GHG emissions resulting from the municipally owned facilities, vehicles, and equipment over which it can exert control with GHG reduction strategies and ultimately lead by example.

The results of GHG emission calculations are presented by emissions scope, relating to the degree of control the City has over emissions sources, and the specific sources with which the emissions are associated. Emissions sources are categorized as direct (i.e., Scope 1) or indirect (i.e., Scope 2 or Scope 3), in accordance with the World Resources Institute and the World Business Council for Sustainable Development's Greenhouse Gas Protocol Corporate Standard. In 2021, San Fernando government operations emitted approximately 3,888 MT CO_2e. The results of the GHG inventory are summarized in Figure 19 and Table 3.

Figure 19 Municipal GHG Emissions by Sector

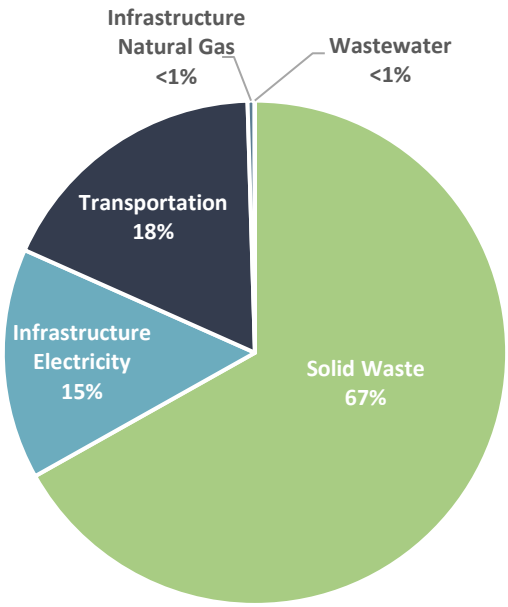


Table 3 Municipal Emissions by Sector and Subsector

Sector and Subsector	Scope	2021 GHG Emissions (MT CO_2e)	Percent of 2021 Emissions (%)
Solid Waste	**3**	**2,579**	**67%**
Solid Waste	3	2,579	67%
Transportation	**1 & 3**	**689**	**18%**
Vehicle Fleet	1	306	8%
Transit	3	239	6%
Employee Commute	3	144	4%
Infrastructure Electricity	**2**	**597**	**15%**
Buildings and Facilities	2	597	15%
Infrastructure Natural Gas	**1**	**22**	**1%**
Buildings and Facilities	1	22	1%
Wastewater	**3**	**1**	**<1%**
Wastewater	3	1	<1%
Total Emissions		**3,888**	**100%**

The 2021 Municipal GHG Inventory is organized by five primary sectors as shown in Figure 19 and Table 3.

The solid waste sector, driven primarily by methane from municipal waste landfilling, was the largest source of municipal GHG emissions in 2021, generating approximately 2,579 MT CO_2e, or 66 percent of total GHG emissions. The transportation sector, which includes emissions from the City's on- and off-road fleet, Mission City Transit Dial-A-Ride vehicles, and Metro buses serving the area, was the second largest contributor at 689 MT CO_2e (18 percent). Infrastructure electricity associated with streetlights, traffic signals, water delivery, irrigation, sewer infrastructure, vehicle fleet EV charging, and powering buildings and facilities accounted for 597 MT CO_2e (15 percent), while the remaining 1 percent of municipal GHG emissions, about 23 MT CO_2e, came from infrastructure natural gas and wastewater associated with City

operations and employees. Both solid waste and wastewater are treated and disposed of outside city boundaries and therefore considered Scope 3 emission sources.

Appendix D, Greenhouse Gas Inventory Analysis provides further details on the Community GHG Inventory and Municipal GHG Inventory.

GREENHOUSE GAS EMISSIONS FORECAST AND TARGETS

While GHG inventories provide data on San Fernando's current emissions, GHG emission forecasts estimate the city's projected GHG emissions into the future. Forecasts are developed from the 2021 GHG inventory which serves as the baseline year and provide an estimate of how San Fernando's emissions might change over time based on projected population and job growth. Forecasts account for state legislative actions that are anticipated to reduce San Fernando's GHG emissions. GHG emissions are forecasted through the years 2030, 2035, 2040, and 2045 according to two scenarios: a business-as-usual scenario and an adjusted scenario.

Business-as-Usual Forecast

The business-as-usual scenario provides a forecast of how future GHG emissions would change as population, housing, and job growth occurs but without any behavior or legislation changes that would reduce emissions. The business-as-usual forecast is based on growth trends projected in the city's population, housing, employment, and transportation activity over time, according to the Southern California Association of Government's (SCAG) 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction model. Table 4 shows the demographic projections used for the forecast. Most sectors were projected using demographic metrics. However, on-road transportation emissions were forecasted based on data retrieved from Iteris, Inc.[19], with emissions factors derived from EMFAC. Off-road transportation emissions relied on OFFROAD Model projections, with emissions factors assumed to remain stable across fuel types.

Table 4 Business-as-Usual Forecast Demographic and Projection Metrics by Forecast Year

Demographics/ Sector	Data Source	2030	2035	2040	2045
Population[1]	SCAG 2016-2040 RTP/SCS Final Growth Forecast	25,700	26,200	26,900	27,600
Employment	SCAG 2016-2040 RTP/SCS Final Growth Forecast	12,247	12,400	12,700	13,000
Households[2]	SCAG 2016-2040 RTP/SCS Final Growth Forecast and San Fernando 6th Cycle RHNA	8,762	8,864	9,064	9,264
Population Serviced[3]	Calculated	37,947	38,600	39,600	40,600

Notes: RHNA = Regional Housing Needs Allocation; Demographics for 2030 and 2045 are quantified assuming growth rate remains consistent between the years of 2035 and 2045

1. Forecasted population is not adjusted for RHNA allocations under the assumption that total population will not significantly increase due to additional housing units.

2. 2,064 households were added to the SCAG household projections starting in 2030 based on San Fernando's 6th Cycle RHNA

3. Population Serviced[1] is calculated as the combined total number of employees and residents in the city.

[19] Iteris Inc. is an American company specializing in smart mobility infrastructure management and traffic data analysis.

Adjusted Forecast

Several state regulations have been implemented to decrease future local GHG emissions. These regulations have been integrated into an adjusted forecast to reflect the anticipated GHG emission reductions attributable to State initiatives and investments. Key state legislation incorporated in the adjusted forecast includes:

- Renewable Portfolio Standard (Senate Bill 100 and Senate Bill 1020) which requires investor-owned utilities, publicly owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 50 percent of total procurement by 2026, 60 percent by 2030, 90 percent by 2035, 95 percent by 2040, and 100 percent by 2045. The increase in renewable energy resources reduces the GHG-intensity of electricity.
- Building Energy Efficiency Standards (Title 24, Part 6 of the California Code of Regulations) which sets standards for energy-efficient technologies and methods in new buildings to reduce electricity and natural gas consumption in new buildings and increase the use of renewable electricity.
- Transportation legislation including the Advanced Clean Cars Program (introduced by the California Air Resources Board in 2012), Advanced Clean Truck regulation[20], and Innovative Clean Transit regulation which work together to increase the fuel efficiency of fossil-fuel powered on-road vehicles and increase the share of zero-emission vehicles on the road.

Table 5 below presents business-as-usual and forecasted community GHG emissions. The city's business-as-usual GHG emissions are projected to increase to 150,226 MT CO_2e in 2030, 151,991 MT CO_2e in 2035, 154,601 MT CO_2e in 2040, and 157,181 MT CO_2e in 2045 under current conditions. After accounting for statewide regulations and existing local initiatives, the adjusted forecast reflects the level of emissions the City will be responsible for absent any additional local actions. As shown in Table 5, adjusted emissions are projected to reach 121,627 MT CO_2e in 2030, 103,139 MT CO_2e in 2035, 99,653 MT CO_2e in 2040, and 97,400 MT CO_2e in 2045.

Table 5 Forecasted Community GHG Emissions

Community GHG Emissions (MT CO_2e)	2030	2035	2040	2045
Business-as-Usual	150,226	151,991	154,601	157,181
Reductions from State Legislation	28,599	48,852	54,948	59,781
Adjusted Forecast	**121,627**	**103,139**	**99,653**	**97,400**

For additional information on the business-as-usual and adjusted forecasts, as well as the demographic metric calculations, see Appendix D, Greenhouse Gas Inventory Analysis.

California's GHG Emissions Targets

GHG reduction targets are used in climate action planning to establish metrics that guide the community's commitment to achieve GHG emissions reductions and help gauge progress for reducing emissions over time. California has established statewide GHG reduction goals for 2030 and 2045:

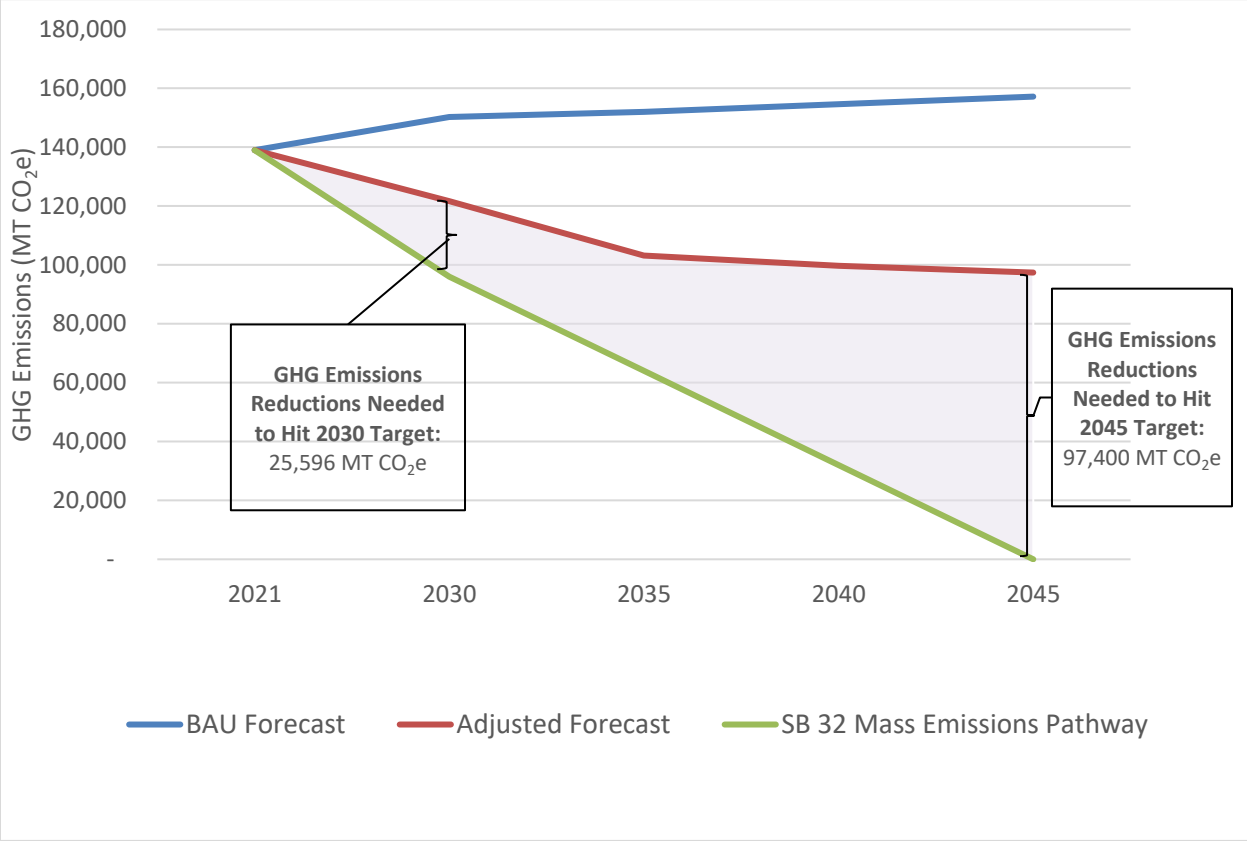
- 2030: reduce GHG emissions to 40 percent below 1990 levels (SB 32)
- 2045: achieve carbon neutrality (AB 1279)

[20] At the time of report writing, it must be noted that EPA has rescinded the previously granted waivers, creating uncertainty regarding the full implementation of this regulation. As a result, it is less certain that the regulation will be fully realized within the next several years, which could in turn delay the ZEV penetration rates assumed under this regulation. However, the impacts of Advanced Clean Trucks on GHG emissions reductions by 2030 are expected to be negligible and result in minimal impact on meeting 2030 targets, therefore the City will re-evaluate the adjusted forecast at the next CARP update to address the inclusion or exclusion of Advanced Clean Trucks impacts, as appropriate.

The strategies developed as part of this CARP are consistent with measures adopted in surrounding communities and establish a clear trajectory toward achieving the 2030 emissions target while making substantial progress toward long-term carbon neutrality. These strategies are not quantified in this CARP due to uncertainty around future federal and state regulations and available funding sources. However, if fully implemented, they are expected to have a significant impact on reducing GHG emissions. The City will actively pursue implementation and quantify GHG emission reductions at a later date, as more certainty emerges and future GHG emissions inventories are developed. This approach will help demonstrate progress toward state climate goals and track whether the city is on course to meet statewide targets. Figure 20 outlines business as usual, legislative-adjusted, and State minimum GHG Reduction pathways for San Fernando.

The strategies are presented in Section E: Climate Action and Resilience Strategies. See Appendix D, Greenhouse Gas Inventory Analysis for more information on the forecast and targets.

Figure 20 GHG Emissions Forecasts and Reductions Needed to Reach Targets



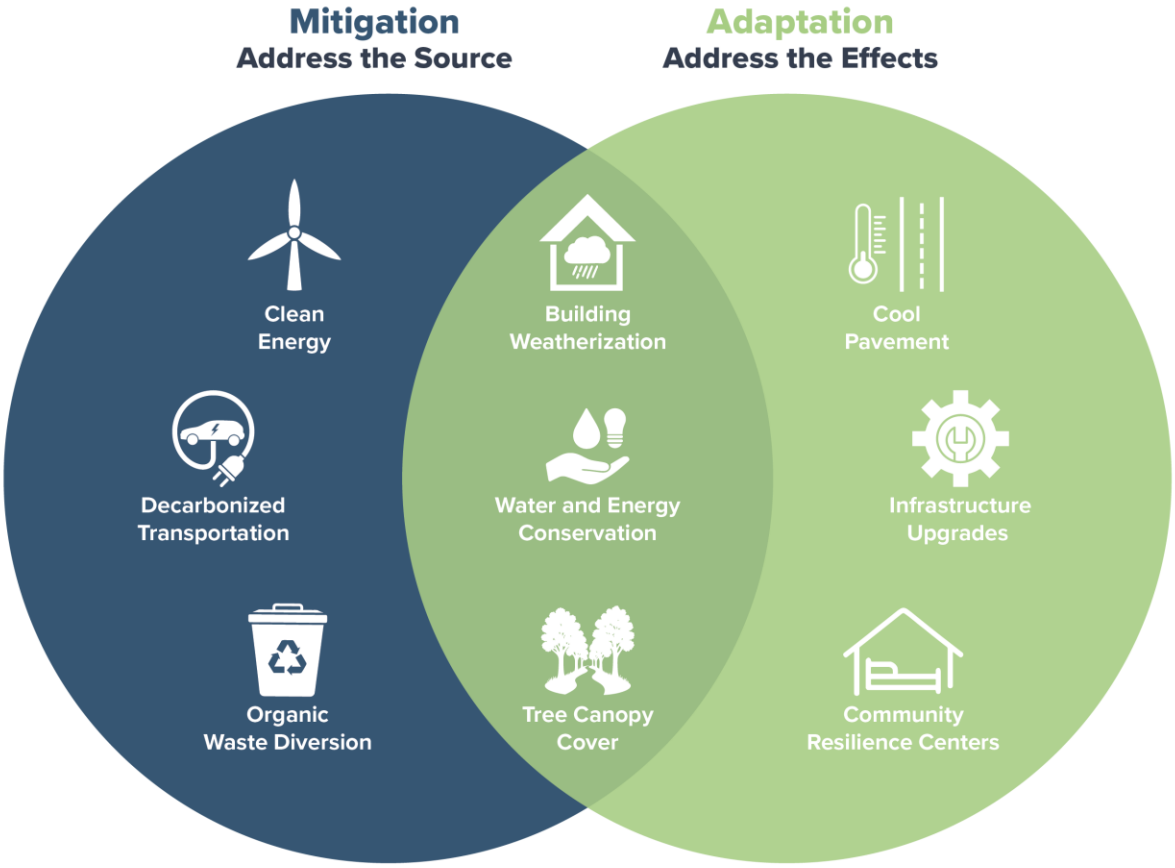
H. CLIMATE ACTION AND RESILIENCE STRATEGIES

Our innovative approach to climate action is based on the understanding that a healthy, resilient, and safe community is built on the integration of multiple systems. Traditionally, climate action and resilience have been disaggregated and viewed as separate areas of focus, with climate action efforts aimed at reducing

greenhouse gas emissions and resilience focused on adapting to the impacts of climate change. This division has often led to siloed planning and missed opportunities for integrated strategies that could maximize resilience while also reducing GHG emissions. This CARP emphasizes the need to blend climate action and resilience, recognizing that a comprehensive approach is essential to addressing both the root causes and effects of climate change, thereby creating co-benefits and more resilient *systems*.

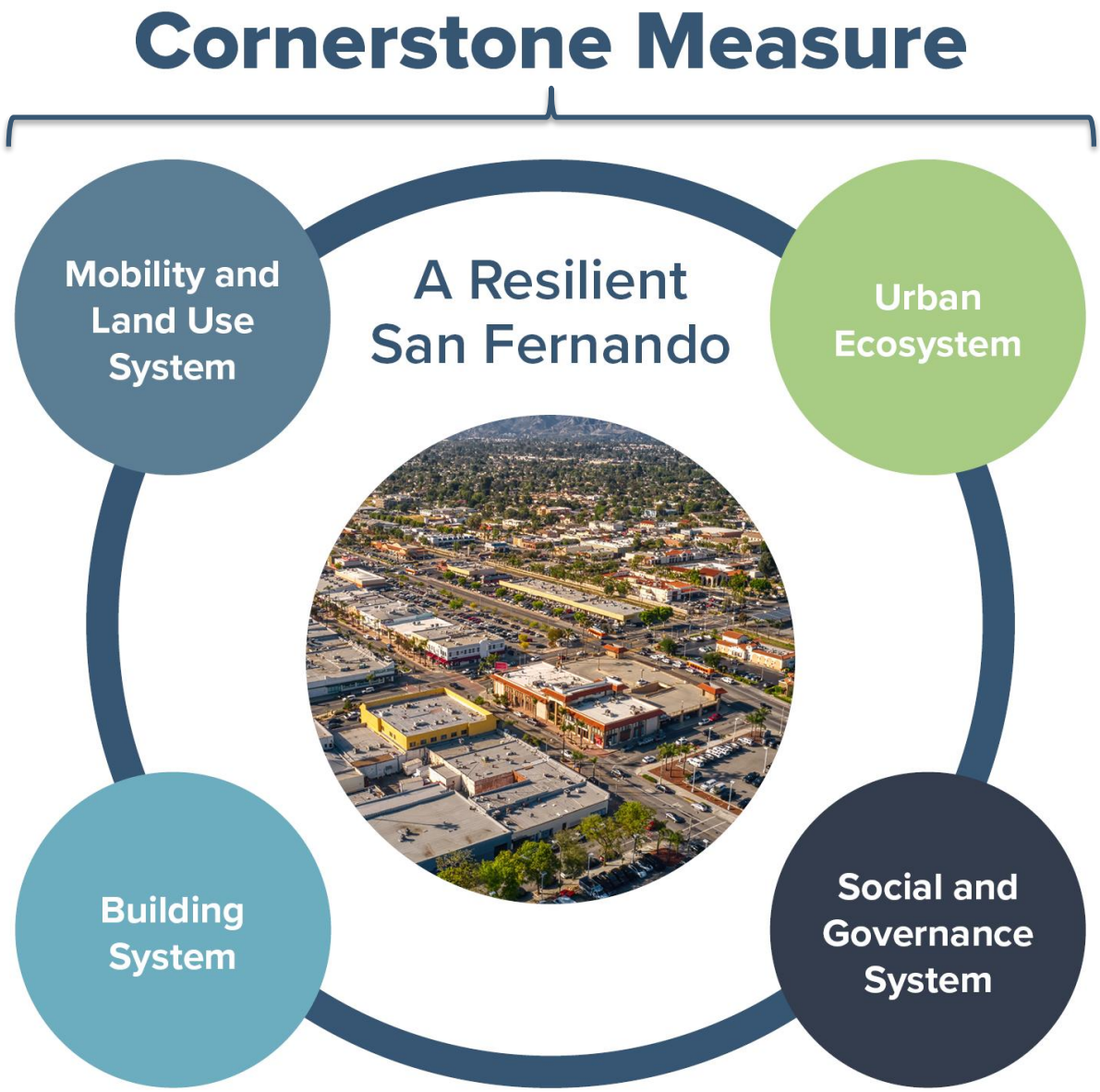
The systems approach adopted for this CARP is modeled after ecosystems, where the outflows of one system serve as inputs to another, fostering interconnectedness and sustainability. This approach promotes a holistic view, recognizing that each action or change in one area can positively or negatively impact other parts of the community, encouraging solutions that benefit multiple systems simultaneously. As such, measures identified by the plan provide both emissions reductions and increased resilience as shown in Figure 21.

Figure 21 Intersection of Climate Action and Climate Resilience



During the CARP development process, the Social and Governance System, Mobility and Land Use System, Buildings and Utilities System, and Urban Ecosystem were identified as the core components that make up the city as shown in Figure 22. In addition to this systems approach, a Cornerstone Measure was developed to embody the CARP's intent, values, and long-term vision. While every measure contributes to reducing emissions and building resilience, a Cornerstone Measure goes further by encapsulating the community's identity and priorities in a way that is both symbolic and practical. It illustrates how the action pillars, described in further detail in the measure layout section, work together to achieve meaningful outcomes.

Figure 22 Systems Based Approach – A Resilient San Fernando



The **Cornerstone** measure on neighborhood resilience demonstrates the City's dedication to protecting residents through trusted local institutions, advancing equity, and empowering community leadership. By elevating one measure as a cornerstone, the CARP creates a touchstone for understanding the broader framework of climate action: it shows how strategies can reduce risks, strengthen community ties, and build a safer, healthier, and more sustainable future for all.

The **Social and Governance System** embeds climate and equity considerations into government operations, strengthens institutional capacity, and demonstrates municipal leadership through visible actions such as decarbonizing City-owned facilities and transitioning the vehicle fleet to zero-emission technologies. This system confirms that San Fernando not only guides policy and investment decisions through a climate and equity lens, but also leads by example—modeling resilience, accountability, and sustainable practices that build trust and inspire action across the community.

The **Mobility and Land Use System** aims to reduce the reliance on single-occupancy vehicles, increase active transportation, enhance the transit system, increase use of passenger and commercial electric vehicles, and decarbonize off-road equipment. The Mobility and Land Use System links the Building Systems with Urban Ecosystems.

The **Buildings and Utilities System** focuses on decarbonizing and weatherizing homes and businesses to make them more resilient to potential climate impacts such as extreme heat, wildfires, and poor air quality. Additionally, the Building and Utilities System outlines a framework to increase carbon-free electricity procurement, which will help reduce greenhouse gas emissions, enhance energy resilience, reduce the risk of power outages due to extreme weather and wildfires, and support a transition to cleaner, more sustainable energy sources in alignment with State goals.

The **Urban Ecosystem** establishes measures that range from increasing organics diversion and tree canopy to enhancing the resilience of the city's water systems. The Urban Ecosystem also encompasses strategies to reduce water use and safeguard local water quality emphasizing the use of natural systems and integrating traditional ecological knowledge.

Together, the integrated systems-based approach breaks down the traditional barriers associated with climate action by taking a higher-level view of the overall framework that makes the city operate.

The unique systems-based approach was further refined by San Fernando's vision for the future as one of resilience, sustainability, and inclusivity, driven by a deep understanding of the real and pressing challenges posed by climate change. As climate impacts manifest locally and are projected to worsen without concerted global action, San Fernando is committed to leading the charge towards significant GHG emissions reduction while preparing for these changes with climate adaptation measures. The CARP serves as a roadmap towards this vision, aiming to safeguard the environment, elevate residents' quality of life, and foster economic prosperity while reducing emissions in line with California's ambitious goals.

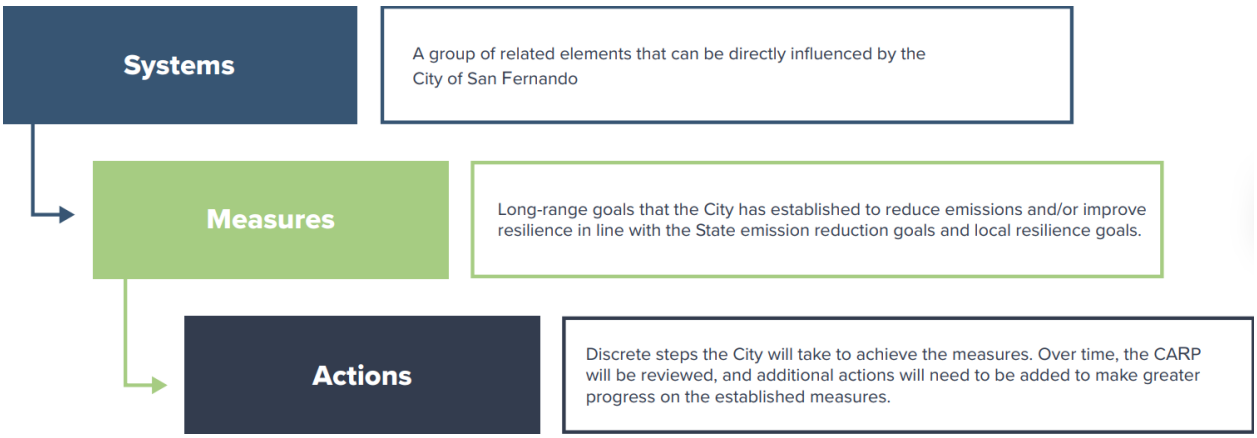
The success of the CARP relies on the collective responsibility of the entire community to act together toward shared goals. By staying engaged, contributing ideas, and supporting the implementation of key actions, individuals and groups play a crucial role in building a more resilient and sustainable future. Through collaboration and commitment, we can fortify the long-term success of the CARP, making positive changes that benefit both the environment and the well-being of the community.

STRATEGY FRAMEWORK

The climate strategies included in this CARP provide a comprehensive path for implementation. As detailed in Figure 23, climate strategies are designed to collectively guide the City toward achieving its long-term climate goals. The plan's measures detail achievable and implementable GHG emissions reduction strategies designed to establish a clear trajectory toward achieving the State's 2030 target while making substantial progress toward long-term carbon neutrality.

Additionally, strategies address climate vulnerabilities in the city and include adaptation-related measures and supporting actions to increase the community's resilience to climate impacts. Over time, the CARP will be updated, and additional actions will need to be added to make greater progress on the established measures, as appropriate. These regular updates will confirm that the plan remains effective in addressing new challenges, seizing opportunities for innovation, and meeting updated local, state, or federal climate goals. Periodic updates allow for the integration of lessons learned from past actions, enabling us to adapt and include more impactful and equitable strategies to make greater progress on the established measures.

Figure 23 Climate Strategy Structure



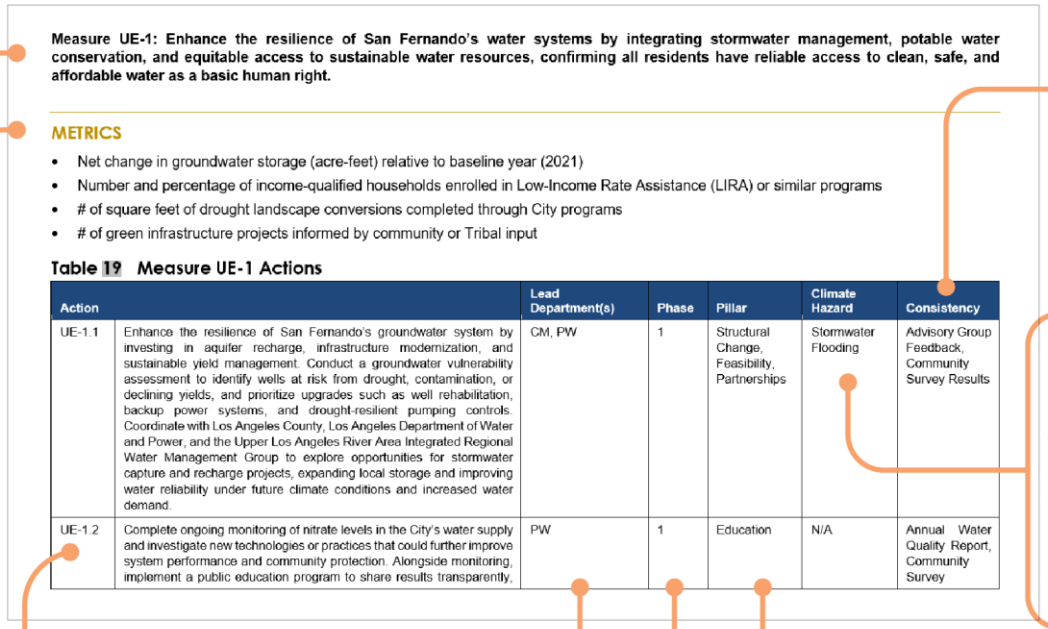
MEASURE LAYOUT

To develop the measures and actions in the CARP, the City balanced several different criteria including climate policy pillars, key climate hazards, community feedback, equity guardrails, and implementation phasing. The following sections define each of the measure and action considerations and their respective icons that are used throughout the Climate Action and Resilience Strategies chapter. The measure and action layout is shown in Figure 24.

Figure 24 Measure Layout Reference

Measure: Long-range goals that the City has established to reduce emissions and/or improve resilience in line with the State emission reduction goals and local resilience goals.

Consistency: Alignment with local/regional plans and programs, equity guardrails, and feedback received during various engagement efforts throughout the CARP's development.



Measure UE-1: Enhance the resilience of San Fernando's water systems by integrating stormwater management, potable water conservation, and equitable access to sustainable water resources, confirming all residents have reliable access to clean, safe, and affordable water as a basic human right.

METRICS

- Net change in groundwater storage (acre-feet) relative to baseline year (2021)
- Number and percentage of income-qualified households enrolled in Low-Income Rate Assistance (LIRA) or similar programs
- # of square feet of drought landscape conversions completed through City programs
- # of green infrastructure projects informed by community or Tribal input

Table 19 Measure UE-1 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
UE-1.1	Enhance the resilience of San Fernando's groundwater system by investing in aquifer recharge, infrastructure modernization, and sustainable yield management. Conduct a groundwater vulnerability assessment to identify wells at risk from drought, contamination, or declining yields, and prioritize upgrades such as well rehabilitation, backup power systems, and drought-resilient pumping controls. Coordinate with Los Angeles County, Los Angeles Department of Water and Power, and the Upper Los Angeles River Area Integrated Regional Water Management Group to explore opportunities for stormwater capture and recharge projects, expanding local storage and improving water reliability under future climate conditions and increased water demand.	CM, PW	1	Structural Change, Feasibility, Partnerships	Stormwater Flooding	Advisory Group Feedback, Community Survey Results
UE-1.2	Complete ongoing monitoring of nitrate levels in the City's water supply and investigate new technologies or practices that could further improve system performance and community protection. Alongside monitoring, implement a public education program to share results transparently,	PW	1	Education	N/A	Annual Water Quality Report, Community Survey

Climate Hazards: Specific climate hazards that impact the City and which actions will provide a direct resilience benefit to San Fernando's climate vulnerabilities.

Actions: Discrete steps the City will take to achieve the measures.

Metrics: Metrics identified to track progress associated with each measure.

Lead Department: City Department leading implementation of specific action.

Phase: Anticipated implementation timeframe to achieve reduction goals.

Pillar: Reasonable, resilient, and equitable climate action and adaptation planning is built on key pillars that are essential for effective implementation.

CLIMATE POLICY PILLARS

Reasonable, resilient, and equitable climate action and resilience planning is built on key pillars that are essential for effective implementation. San Fernando's six Climate Policy Pillars are feasibility, education, equity, funding, partnerships, and structural change, detailed in Figure 25. During the climate measure development process, each initiative was viewed through the lens of these Climate Policy Pillars.

Figure 25 San Fernando's Climate Policy Pillars

Feasibility. Actions that help the City understand the costs, benefits, obstacles, and opportunities associated with programs, policies, and ordinances to make decisions that best serve the community.

Education. Actions to increase community awareness of programs available to reduce individual contributions to GHG emissions and increase resilience and to establish or strengthen communication channels between the City and the communities it serves.

Equity. Actions that engage vulnerable populations in the decision-making process and establish the policies and programs to provide vulnerable populations with the resources to benefit from each measure's objectives in aequitable manner.

Funding. Actions that provide the financial backing (e.g., grant funding, rebates, financial incentives) and adequate City staffing to establish, implement, and maintain a program.

Partnerships. Actions that establish partnerships with external government entities, including Tribes, and community-based organizations to leverage their expertise, resources, and networks to implement programs and policies the City would not be able to achieve alone.

Structural Change. Actions that change existing City programs, policies, and ordinances to allow the City and community to reach the target established within a measure.

CLIMATE HAZARDS

San Fernando, and much of California, is already seeing the impacts of climate change including prolonged droughts, extreme heat, and increased intensity of stormwater flooding. Each measure taken to address local emissions not only reduces our contribution to global emissions, but will also prepare San Fernando for future challenges. By proactively addressing emissions and preparing for future climate impacts, the City creates a safer, more sustainable, and adaptable future for all.

Measures and actions included throughout the CARP are designed to directly address these specific climate hazards, such as implementing heat-resilient infrastructure to combat extreme heat, enhancing water conservation efforts to mitigate drought, and improving urban forest management to reduce stormwater flooding risks so the community. Actions that provide a direct resilience benefit to San Fernando's climate vulnerabilities include a separate call out depicting the climate hazard it helps to address. Climate hazards most relevant to the city, on which the resilience actions are focused, include:

Extreme Heat

Drought

Stormwater Flooding

Poor Air Quality

IMPLEMENTATION PHASES

The measures and actions have been developed to be implemented over time to reduce emissions and increase the city's resilience in a thoughtful, achievable, and stepwise process. As such, the actions are anticipated to be completed in phases, as outlined below:

- Phase 1: 2026-2028
- Phase 2: 2029-2034
- Phase 3: 2035 and beyond

This CARP has been developed as an adaptively managed framework that employs a phased approach, creating a stepwise process for implementing actions while allowing for regular updates in future years to review progress, incorporate emerging technologies, and integrate more effective strategies as they become available. This flexibility allows the CARP to remain dynamic and responsive to changing conditions, enabling the community to continuously refine its approach to achieving climate resilience and emissions reduction goals while leveraging the best available science and innovations in the most fiscally responsible and thoughtful way.

EQUITY GUARDRAILS

Equity guardrails were developed with input from the Advisory Group to serve as guiding principles for the CARP's measures and actions. The purpose of these guardrails is to confirm that key actions advance equitable outcomes—prioritizing benefits for historically underserved or climate-vulnerable communities, preventing disproportionate burdens, and fostering meaningful community participation in decision-making. By embedding these principles across all systems, the guardrails help confirm that implementation of the CARP supports both environmental sustainability and social resilience. The five equity guardrails are listed below and described in detail in the Carp Vision section.

1. **Prioritize Fair and Inclusive Access to Resources and Opportunities.**
2. **Strengthen Sustainable City Revenue and Support a Vibrant Downtown.**
3. **Foster Cultural Resilience in Community Sustainability.**
4. **Invest in Neighborhoods to Safeguard Housing Stability.**
5. **Foster Safe, Healthy, and Connected Communities.**

LEAD CITY DEPARTMENTS

A lead city department is assigned to each action to clearly denote which department is responsible for implementing the action. Identified city departments are shown in Table 6.

Table 6 City Departments and Abbreviations

Department	Abbreviation
Administration Services	AS
City Clerk	CC
Community Development	CD
City Manager's Office	CM
Finance	FN
Police	PL
Public Works	PW
Recreation and Community Services	RC

MEASURE SUMMARY TABLE

Table 7 presents the City of San Fernando's CARP measures, organized across four systems—Social and Governance, Mobility and Land Use, Buildings and Utilities, and Urban Ecosystem. Together, these four systems and the Cornerstone Measure establish a coordinated framework to reduce GHG emissions, strengthen community resilience, and advance equitable access to resources and opportunities.

Each measure builds upon existing City plans and strategies, such as the Urban Forest Management Plan, Housing and Safety Elements, and Mobility Element, confirming alignment across sectors. Collectively, they translate San Fernando's climate goals into actionable steps that reflect local priorities, community feedback, and the equity guardrails developed through the CARP Advisory Group process.

Table 7 Climate Action and Resilience Plan Systems and Measures

Measure ID	Measure Text
Cornerstone	
CS-1	Expand and strengthen neighborhood resilience by supporting the development of year-round community resilience hubs within trusted local facilities. These hubs would provide residents with accessible resources to address the city's most pressing climate hazards.
Social and Governance System	
SG-1	Revise protocols and procedures internal to the City to integrate a climate and equity perspective into all government operational decision-making, prioritizing increased investments in CARP implementation to support vulnerable populations.
SG-2	Build neighborhood-wide resilience by supporting local networks, training, and resources that empower residents to respond to climate risks. Efforts will emphasize multilingual outreach, leadership development, and partnerships that strengthen capacity in historically underserved communities, including sovereign Tribal Nations, through recognizing cultural heritage in programs and projects.
Mobility and Land Use System	
MLU-1	Reduce reliance on single-occupancy vehicles by promoting housing near transit-accessible corridors and downtown; expanding open space, mixed-use development with shops, services, and local employment; and supporting alternative commuting options for residents who work outside the city.
MLU-2	Expand and optimize the San Fernando trolley network to improve route coverage, accessibility, safety, and connections to key destinations such as downtown, schools, parks, transit hubs, and native and other cultural centers, while integrating community feedback on service frequency, financial feasibility, and minimal disruption to street infrastructure.
MLU-3	Increase walking, biking, and other active transportation in San Fernando by upgrading sidewalks, crosswalks, bike lanes, and pedestrian paths to improve safety, accessibility, and connectivity. Prioritize integrated planning for shaded routes, stormwater capture, lighting, ADA-compliant infrastructure, and secure bike parking to confirm all residents have equitable access to convenient and safe active transportation options.
MLU-4	Prepare the city for widespread zero-emission vehicle adoption by investing in universal EV charging stations (public and commercial), offering community EV education and ride-and-drive events, and promoting safe passenger and commercial EV use as vehicle costs decline.

Measure ID	Measure Text
Buildings and Utilities System	
BU-1	Support communitywide transition to carbon-free electricity by partnering with Southern California Edison and regional agencies and NGOs with related experience to expand rooftop solar, battery storage, and neighborhood-scale microgrids. Improve electrical system resilience with targeted upgrades such as backup power for schools and resilience hubs, and promote demand-response programs that help residents and businesses reduce peak-time energy use and lower monthly bills.
BU-2	Require new buildings to meet high standards for health, safety, and resilience by incorporating all-electric systems, efficient cooling, and extreme heat protections while respecting San Fernando's historic character.
BU-3	Connect building owners and renters with incentives, rebate, and education programs to upgrade existing homes and businesses, enabling them to become zero-carbon and resilient to extreme heat, flooding, and poor air quality.
BU-4	Decarbonize City-owned buildings through energy efficiency upgrades, renewable energy integration, and electrification of key systems. Partner with local trade schools and workforce programs to train and employ residents in implementing these projects, creating green jobs and building community capacity while demonstrating City leadership in sustainability and resilience.
Urban Ecosystem	
UE-1	Enhance the resilience of San Fernando's water systems by integrating stormwater management, potable water conservation, and equitable access to sustainable water resources, confirming all residents have reliable access to clean, safe, and affordable water as a basic human right.
UE-2	Increase citywide tree canopy and community-centered green spaces to reduce the urban heat island effect by supporting and implementing the strategies outlined in the Urban Forest Management Plan.
UE-3	Increase diversion of landfilled organics in San Fernando to achieve compliance with SB 1383 by expanding food scrap and green waste collection, using recovered organic waste products locally, and partnering with schools and nonprofits to recover surplus edible food for residents.

CORNERSTONE MEASURE

The Cornerstone Measure establishes the foundation of the City's Climate Action and Resilience Plan by focusing on neighborhood-scale resilience. It emphasizes the creation of trusted, year-round resilience hubs that provide critical resources, services, and cooling during emergencies, confirming every resident has access to safe spaces that strengthen community preparedness and social cohesion. Actions can be found in Table 8 below.

Measure CS-1: Expand and strengthen neighborhood resilience by supporting the development of year-round community resilience hubs within trusted local facilities. These hubs would provide residents with accessible resources to address the city's most pressing climate hazards.

METRICS

- Completion of key infrastructure upgrades, such as HVAC and solar panels with battery storage
- % of surveyed residents who are aware of resilience hubs and their services
- # of outreach events, workshops, and training sessions conducted at resilience hubs

Table 8 Measure CS-1 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
CS-1.1	Partner with the Los Angeles Unified School District (LAUSD), the San Fernando Valley Interfaith Council (VIC), and Meet Each Need with Dignity (MEND) group to conduct facilities readiness assessments and identify schools, community centers, and faith-based institutions that already have the infrastructure (e.g., generator capacity, ADA accessibility, kitchen facilities) to serve as resilience hubs, and support development of cost estimate for upgrades where gaps exist.	CM, CD, RC	1	Feasibility	N/A	Advisory Group Feedback, Equity Guardrail #3
CS-1.2	Establish formal agreements (MOUs) between community-based organizations, Tribal Nations and facility operators to coordinate training, resource sharing, and emergency operations, leveraging trusted local leaders to co-design programs. Additionally, provide ongoing support for community-led programming that reflects local needs and cultures by providing space, City staff time, or funds.	CM, CD, RC	1	Partnership	N/A	Advisory Group Feedback, Equity Guardrail #1, 3
CS-1.3	Develop and implement a multilingual communication plan co-created with community representatives to confirm that resilience hub information and emergency resources are accessible to all residents. Additionally, develop a peer learning network where resilience hub leaders can share best practices and troubleshoot challenges together.	CD, RC	1	Equity	N/A	Advisory Group Feedback, Community Survey

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
						Results, Equity Guardrail #1
CS-1.4	Utilize an existing educational platform and develop community specific emergency information for people to learn about how to improve their household resilience in advance of a climate emergency. Partner with community-based organizations and Tribal Nations to develop the materials in a clear and thoughtful way, then distribute the information to their communities. Provide access to resources and information on how to prepare personal protection plans, what to do in an emergency, and information on how to register for resources. In tandem with the physical locations, provide information on the City's website for a digital resilience space. Additionally, share information about the City's CARP to raise awareness about community vulnerabilities to climate change and promote strategies for building resilience.	CD	1	Education	N/A	Advisory Group Feedback, Community Survey Results, Equity Guardrail #1, 5
CS-1.5	Provide resources during emergencies to equip public facilities and key community buildings with backup power, clean air filtration, emergency water and food supplies, and communication tools, while offering multilingual outreach, training, and materials to help community members prepare their homes and care for vulnerable populations in a climate emergency. As part of this initiative, partner with Tribal Nations, churches and faith-based organizations to serve as trusted hubs with multilingual emergency preparedness outreach and to provide respite during climate-related events. Support training for staff and volunteers to assist vulnerable community members.	CD, PL	1	Structural Change	N/A	Advisory Group Feedback, Community Survey Results, Equity Guardrail #1, 5
CS-1.6	Support residents in safely sheltering at home during emergencies by distributing air purifiers, backup power sources (such as portable batteries), emergency water and food kits, and heat mitigation supplies (such as fans or reflective window coverings), and by offering targeted assistance to low-income and medically vulnerable households through multilingual outreach, partnerships with community organizations, Tribal Nations, and home retrofit programs.	CD, PW	1	Education, Equity	Extreme Heat, Poor Air Quality	Advisory Group Feedback, Community Survey Results, Equity Guardrail #1
CS-1.7	Identify and apply for funding opportunities that support development of community resilience hubs, and/or staff positions to support community resilience hubs, such as the LCI's Grant Programs. Similarly, identify and apply for funding opportunities, such as CPUC's Self-Generation Incentive Program (SGIP), that support development of solar energy +	CD, FN, RC	1	Funding	N/A	Advisory Group Feedback, Equity Guardrail #2

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	battery storage systems especially for low-income, disadvantaged, or infrastructure-vulnerable communities.					

SOCIAL AND GOVERNANCE SYSTEM

The Social and Governance System focuses on building the institutional and community capacity needed to implement the CARP equitably and effectively. These measures embed climate and equity considerations into City operations, empower local leaders, and strengthen collaboration with residents, community-based organizations, and Tribal partners to confirm climate action benefits those most vulnerable to its impacts. Actions can be found in Table 9 through Table 10 below.

Measure SG-1: Revise internal protocols and procedures to integrate a climate and equity perspective into government operational decision-making, prioritizing increased investments in CARP implementation to support vulnerable populations.

METRICS

- % of San Fernando budget invested in CARP implementation annually
- % of departments with climate and equity lens integrated into standard operating procedures
- % of CARP related funding directed towards initiatives benefiting vulnerable populations

Table 9 Measure SG-1 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
SG-1.1	Explore strategies to leverage San Fernando's financing processes and potential external funding opportunities to implement CARP actions. This could include: • Identifying ways CARP strategies could be integrated into existing City financing programs, such as capital improvement budgets, utility fees, or local revenue streams to align with climate goals. • Compiling a list of statewide and regional funding programs, including the Ready for Tomorrow program Enhanced Infrastructure Financing Districts (EIFDs) and Clean California Investments (CCI), among others that could support implementation.	FN, CM, CD, PW	1	Feasibility, Funding	N/A	City Council Feedback, Equity Guardrail #2

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	• Monitoring the grant programs identified as part of this CARP and in future iterations that could support CARP implementation and apply for viable grants as appropriate. • Developing a high-level tracking system for monitoring the availability, eligibility, and applicability of external funding sources for specific projects and activities. • Exploring the feasibility of leveraging local revenue streams (e.g., sewage, trash, or taxes) to secure additional financing or match funds for CARP projects. • Considering establishing dedicated capacity for funding pursuits, such as a summer internship or Civic Spark fellow focused on identifying and applying for grant opportunities. • Establish a framework for working with local Tribal Nations and CBOs to collaborate on funding requests which address the City's resilience goals. • Develop local partnerships for grant application purposes which can leverage the expertise of Tribal Nations, community-based organizations, youth workforce and faith-based entities.					
SG-1.2	Integrate climate resilience and equity principles into staff training programs across all departments by incorporating topics such as climate risk assessment, environmental justice, local ecology, and inclusive community engagement with Tribal Nations and community based organizations. Leverage existing resources such as state agency toolkits (e.g., CalEPA's EJ Mapping Tool), FEMA and EPA training modules, and partnerships with community-based organizations and local Tribal Nations to deliver tailored, department-specific learning opportunities.	CD, PL, AS, PW	1	Education	N/A	Planning Commission Feedback, Community Survey Results,
SG-1.3	Collaborate with regional agencies, local Tribal Nations, community-based organizations, and academic partners to co-develop equity-focused decision-making frameworks and screening tools that guide City operations. Leverage partnerships to secure technical assistance and funding, confirming that CARP implementation investments prioritize vulnerable populations	CM,CD, RC, CM	1	Partnership, Equity	N/A	Equity Guardrail #3, 5
SG-1.4	Expand the scope of existing City Commissions to incorporate an equity and climate lens into their decision-making processes. Establish a rubric or toolkit for the Commissions to evaluate proposals, policies, and projects for their potential climate impacts	CM	1	Structural Change, Equity	N/A	Equity Guardrail #3, 4

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	and contributions to increase equitable access to resources, reduce greenhouse gas reduction, and increase community resilience. Additionally, update staff reports to Commissions to include a "Climate and Equity Implications" section outlining potential environmental benefits or risks.					
SG-1.5	Conduct a thorough review involving climate data analysis of health impacts to outdoor workers and adjust policies to adapt city staff and contractor outdoor worker hours and conditions in response to changing climate, in compliance with Cal/OSHA standards and city programs, prioritizing worker safety and well-being.	AS, PW, RC	1	Feasibility	N/A	Community Survey Results, Equity Guardrail #5
SG-1.6	Review and, if needed, update the community resource guide annually and post it on the City's website with a consolidated list of rebates and incentives, as well as other community resources, such as financing programs for renters and homeowners, technical assistance for building retrofits, energy-efficiency workshops, local contractors and service providers, and emergency preparedness information.	PW, CD	1	Education	N/A	Community Survey Results, Equity Guardrail #1
SG-1.7	Develop a climate-informed project design checklist, drawing from SCAG's Climate Adaptation and Resilience Planning checklist[21] or similar resources, to guide capital improvement projects during the planning and design phase. The checklist will require evaluation of future climate projections, such as extreme heat, air quality, and flooding risks, as well as integrate design considerations that enhance long-term resilience and equity. Collaborate with project partners to incorporate equity considerations, as discussed in action SG-1.8.	CD, PW	2	Structural Change	N/A	Planning Commission Feedback, City Council Feedback, Equity Guardrail #1
SG-1.8	Promote and recognize sustainability leadership among local businesses, Tribal Nations, organizations, and individuals by nominating up to three exemplary local projects annually to existing regional or national award programs, such as the SCAG Sustainability Awards, City Best Awards, or other relevant recognition platforms. Complement these nominations by integrating sustainability criteria into the City's economic development initiatives to encourage and highlight innovative, equitable, and impactful climate practices. This approach allows the City to celebrate local	CD, CM	3	Structural Change	N/A	City Council Feedback, Community Survey Results, Equity Guardrail #4, 5

[21] SCAG's Climate Adaptation and Resilience Planning checklist. Available at: https://hub.scag.ca.gov/items/11ebb317612a4448a46af5c91981d851

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	efforts, share successful strategies, and foster collaboration without creating a standalone award program.					

Measure SG-2: Build neighborhood-wide resilience by supporting local networks, training, and resources that empower residents to respond to climate risks. Efforts will emphasize multilingual outreach, leadership development, and partnerships that strengthen capacity in historically underserved communities, including sovereign Tribal Nations, through recognizing cultural heritage in programs and projects.

METRICS

- % of residents participating in resilience trainings, workshops, or capacity-building programs
- # of shade structures, portable air quality monitors, or temporary cooling stations developed/installed

Table 10 Measure SG-2 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
SG-2.1	Identify and pilot low-cost, easy-to-implement neighborhood resilience strategies, such as temporary cooling stations, portable air-quality monitors, or shade installations, in select neighborhoods to demonstrate practical, scalable approaches before city-wide expansion. Explore the feasibility of nature-based and water-assisted cooling stations, including urban micro forests and water-cooled structures.	CD, PW, RC	1	Feasibility	Extreme Heat, Poor Air Quality	Community Survey Results, Equity Guardrail #3, Advisory Group Feedback
SG-2.2	Build strategic collaborations with schools, local Tribal Nations, community centers, faith-based organizations, and regional agencies to co-develop and implement neighborhood resilience initiatives, strengthen mutual aid networks, and enhance knowledge-sharing and coordination across neighborhoods.	CD, CM, PW	1	Partnerships	N/A	Community Survey Results, City Council Feedback, Equity Guardrail #5
SG-2.3	Institutionalize neighborhood capacity-building practices within City policy by embedding requirements for community engagement and equity-focused resilience strategies in the General Plan, emergency management protocols, and capital project planning.	CD, CM, PW	1	Structural Change	N/A	Community Survey Results, Equity

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
						Guardrail #4
SG-2.4	Identify existing multilingual training modules and workshops that residents and neighborhood leaders can participate in to learn current best practices on responding to extreme heat and poor air quality, including practical skills, emergency preparedness, and sustainable behaviors, leveraging partnerships with schools, Tribal Nations, faith-based organizations, and local nonprofits.	CD, PL, PW	1	Education	Extreme Heat, Poor Air Quality	Community Survey Results, Equity Guardrail #1
SG-2.5	Target resources, training, and capacity-building programs toward the community's most vulnerable populations, providing leadership opportunities, culturally relevant materials with an emphasis on native history, and engagement strategies that reduce disparities in climate risk and access to resilience tools.	CD	1	Equity	N/A	Equity Guardrail #1, 5, Community Survey Results
SG-2.6	Develop an equity investment program with local employers, businesses, Tribal Nations, philanthropic institutions, educational institutions, trade associations, businesses, and/or non-profit organizations to secure local match funding for economic development and climate partner readiness grants for vulnerable populations and investments in areas of high social sensitivity.	CM, CD, FN	2	Funding	N/A	Community Survey Results, Equity Guardrail #2

MOBILITY AND LAND USE SYSTEM

The Mobility and Land Use System promotes cleaner, safer, and more connected transportation choices while supporting land use patterns that reduce vehicle dependence and improve accessibility. Measures in this system integrate housing, jobs, and transit investments, expanding mobility options such as walking, biking, transit, and zero-emission vehicles to create a more equitable, low-carbon transportation network. Actions can be found in Table 11 through Table 14 below.

Measure MLU-1: Reduce reliance on single-occupancy vehicles by promoting housing near transit-accessible corridors and downtown; expanding mixed-use development with shops, services, and local employment; and supporting sustainable commuting options for residents who work outside the city.

METRICS

- # of affordable housing units constructed annually near transit hubs
- # of transit-oriented development constructed annually near transit hubs
- Square feet of area rezoned for increased residential density or mixed-use development

- % of residents taking public transit

Table 11 Measure MLU-1 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
MLU-1.1	Launch a community education campaign to promote commuter alternatives, including transit, vanpools, carpools, and e-biking, highlighting cost savings, convenience, environmental and quality of life benefits. Align outreach with the First/Last Mile Access Improvement Plan[22] and neighboring light rail projects to confirm information reflects emerging mobility options. The campaign will provide practical guidance on navigating the regional transit system and integrating multiple modes of travel, such as biking and accessing light rail for safer and more efficient commutes.	CD, PW	1	Education, Equity	N/A	Community Survey Results, General Plan Mobility Element
MLU-1.2	Identify and pursue state, federal, and regional funding opportunities such as the Affordable Housing and Sustainable Communities (AHSC) Program, Transformative Climate Communities (TCC) Program, and Metro's Transportation Demand Management grants to support implementation of mixed-use and transit-oriented projects. Develop a coordinated funding strategy to leverage public and private investment for affordable housing and mobility enhancements within Downtown San Fernando and key corridor areas.	CM, CD, FN	1	Funding	N/A	City Council Feedback, Equity Guardrail #2
MLU-1.3	Work with San Fernando Senior High School, Cesar Chavez Learning Academies, and Mission Continuation School to integrate more robust information into Driver's Education programs that teaches new drivers how to safely and actively share the road with all forms of commuters, including cyclists, pedestrians, and transit users. As part of this program, reinforce safety goals of the First/Last Mile Access Improvement Plan.	CD, RC	1	Structural Change	N/A	Community Survey Results, Advisory Group Feedback
MLU-1.4	Support major developments in San Fernando in implementing Transportation Demand Management (TDM) programs. Provide education on the benefits to encourage employers to implement strategies such as subsidized transit passes, flexible work schedules, vanpool incentives, carpool matching, and end-of-trip facilities for cyclists, confirming these programs prioritize	CD, CM	1	Partnerships, Equity	N/A	City Council Feedback, Advisory Group Feedback

[22] Program #14 of the Mobility Element includes development of a First/Last Mile Access Improvement Plan as a key step toward improving transit connectivity and accessibility citywide

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	accessibility and participation for San Fernando residents.					
MLU-1.5	Update objective design standards for mixed-use zoning districts and First/Last Mile development to require awnings, canopies, and other shade structures that may encroach into setbacks to enhance pedestrian comfort, especially near transit corridors.	CM, PW, CD	2	Structural Change	Extreme Heat	Advisory Group Feedback, Community Survey Results
MLU-1.6	Leverage the City's Parking Management Master Plan,[23] the Housing Element[24] and feedback from the community to identify and strategically rezone underutilized areas (e.g., City-owned parking lots) around major corridors and nodes to allow for a blend of housing, shops, services, and employment opportunities in alignment with future Transit Priority Areas.[25] Amend the zoning code for inclusionary standards to prioritize the creation of affordable housing units within these projects, to provide multimodal enhancements and minimize displacement and support long-term housing stability for existing residents.	CM, PW, CD	2	Feasibility	N/A	Parking Management Master Plan, Community Survey Results, Equity Guardrails #2 and 4, General Plan Mobility Element
MLU-1.7	Work with Los Angeles County Metropolitan Transportation Authority (LA Metro) to install safe, convenient, and visually attractive transit shade structures that provide protection from the increasingly extreme weather due to climate change, including extreme heat and rain, as well as lighting to increase safety and accessibility at all transit stops including those along Truman Steet and San Fernando Road. Install citywide multimodal wayfinding signage system with consistent branding and design, targeting high-traffic corridors, downtown, transit stops, and bikeways.	CM, PW	2	Structural Change	N/A	Community Survey Results, Planning Commission Feedback, Equity Guardrails #5, General Plan Mobility Element
MLU-1.8	Leverage existing relationships and foster new relationships with entities such as the San Fernando Valley Council of Governments, the San Fernando Valley Service Council, East San Fernando Valley Light Rail Community Leadership Council, and Southern California Association of Governments (SCAG) to partner with LA Metro, other regional transit providers, and employers to improve regional transit connections (e.g., Metro bus	CD, PW, CD	3	Partnerships	N/A	Community Survey Results, Advisory Group Feedback, Equity Guardrails #1 and 5, General Plan Mobility Element

23 https://ci.san-fernando.ca.us/wp-content/uploads/2022/04/Cityof-SanFernando-PMMP.pdf

24 https://ci.san-fernando.ca.us/wp-content/uploads/2022/12/San-Fernando-Housing-Element-Final-11-21-22.pdf

25 Transit Priority Areas (TPAs), identified in Program #16 of the Mobility Element, are zones within a half mile of major or planned transit stops where higher-density, mixed-use development is encouraged to reduce VMT and support SB 743 goals.

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	lines linking the city to Sylmar, Pacoima, Burbank, Glendale, and Downtown Los Angeles, future light rail enhancements in neighboring jurisdictions), expand park-and-ride facilities, and promote carpooling and multi-modal transportation options for commuters. Engage the community to confirm priorities and desired outcomes for regional transit connection improvements.					

Measure MLU-2: Expand and optimize the San Fernando trolley network to improve route coverage, accessibility, safety, and connections to key destinations such as downtown, schools, parks, transit hubs, and native and other cultural centers, while integrating community feedback on service frequency, financial feasibility, and minimal disruption to street infrastructure.

METRICS

- # of new or optimized routes and percentage of city area served by the trolley.
- Average daily and monthly ridership, including breakdown by neighborhood or key destinations.

Table 12 Measure MLU-2 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
MLU-2.1	Conduct a comprehensive assessment of the trolley network, including route coverage, ridership demand, infrastructure needs, and financial feasibility, to identify priority improvements and confirm cost-effective implementation. Trolley network enhancements should be implemented without compromising funding for essential street improvements.	PW	1	Feasibility	N/A	Planning Commission Feedback, City Council Feedback
MLU-2.2	Collaborate with regional transit agencies, local businesses, and funders to secure resources for trolley expansion, safety enhancements, accessibility upgrades, and ongoing operations.	CM	1	Funding	N/A	City Council Feedback, Equity Guardrail #2
MLU-2.3	Coordinate with local schools, parks, businesses, local Tribal Nations, and community organizations to integrate the trolley network with existing services and evaluate whether the system meets community needs through onboard and online rider surveys and gathering feedback at community events. This would include understanding who currently uses the trolley, trip purposes (e.g., work, school, shopping), and satisfaction with routes, frequency,	RC,PW	1	Partnerships	N/A	Community Survey Results, Equity Guardrails #1 and 5

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	safety, and accessibility.					
MLU-2.4	Launch a community engagement campaign including pop-ups, social media posts, and updates at Commission and Council meetings to inform residents about trolley routes, schedules, safety features, and connections to key destinations, while soliciting feedback on service frequency and accessibility.	CD, PW	1	Education	N/A	Advisory Group Feedback
MLU-2.5	Partner with local artists, San Fernando Valley Historical Society, and local Tribal Nations, to integrate public art, branding, and cultural storytelling into the San Fernando trolley network. Explore weekend and/or holiday programming that transforms the trolley into a guided tour highlighting the city's history, landmarks, and cultural assets.	CD, RC	2	Partnerships, Education	N/A	Advisory Group Feedback, Equity Guardrail #3
MLU-2.6	Focus trolley expansions and upgrades on high-use corridors and key destinations such as downtown, schools, parks, and transit hubs, providing equitable access for all residents. Explore adjusting the trolley's route and frequency during major community events, such as the swap meet, to better accommodate attendees and enhance accessibility based on feedback from community.	CD, PW	2	Equity	N/A	Advisory Group Feedback, Equity Guardrails #1 and 5
MLU-2.7	Update city planning and street infrastructure policies to support trolley operations, minimize conflicts with other street uses, and integrate trolley access into transit-oriented development and multimodal transportation planning.	CD,PW	2	Structural Change	N/A	Advisory Group Feedback
MLU-2.8	Once the expansions are in place and ridership begins to increase, analyze the feasibility of transitioning the existing City Trolley to an electric vehicle (EV) fleet by assessing operational needs, route demands, vehicle and charging infrastructure options, funding sources, and potential greenhouse gas (GHG) and cost savings to support future procurement and implementation.	CD, PW	3	Feasibility	N/A	Community Feedback

Measure MLU-3: Increase walking, biking, and other active transportation in San Fernando by upgrading sidewalks, crosswalks, bike lanes, and pedestrian paths to improve safety, accessibility, and connectivity. Prioritize shaded routes, stormwater capture, lighting, ADA-compliant infrastructure, and secure bike parking to confirm all residents have equitable access to convenient and safe active transportation options.

METRICS

- % active transportation mode shift

Table 13 Measure MLU-3 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
MLU-3.1	Create a prioritization and implementation framework for the top-priority capital projects in the San Fernando Safe and Active Streets Implementation Plan, such as new buffered bike lanes on San Fernando Road and Kalisher Street, and enhanced crossings with Rectangular Rapid Flashing Beacons. This framework will prioritize projects that deliver the greatest safety, mobility, and public health benefits guided by community feedback. It will include clear criteria for project selection, timelines, funding strategies, and measurable performance indicators to support transparent decision-making and efficient allocation of resources.	PW, RC	1	Feasibility	N/A	Safe and Active Streets Implementation Plan, Planning Commission, Equity Guardrail #1 and 5, General Plan Mobility Element
MLU-3.2	Continue to pursue funding from Caltrans' Active Transportation Program or similar funding opportunities to implement improvements from the City's long-range active transportation plans, including the San Fernando Safe and Active Streets Implementation Plan, the Mobility Element, and the Corridor Specific Plan of 2017 (SP5). This can include new protected bike lanes, widened sidewalks, traffic-calming measures, and improved pedestrian crossings in high-need areas.	CM, FN	1	Funding	N/A	Advisory Group Feedback, Planning Commission Feedback, Equity Guardrail #2
MLU-3.3	Collaborate with local elementary and middle schools to organize regular "Walk-to-School" events, promoting the benefits of walking and biking while educating families about safe routes. Use these events to gather community feedback on gaps, barriers, and needs related to active transportation.	CD, RC	1	Education	N/A	Advisory Group Feedback, Community Survey Results, Equity Guardrails #1 and 5
MLU-3.4	Partner with an entities such as Metro, The San Fernando Valley Council	CM, CD, PW	1	Partnerships, Funding, Equity	N/A	Advisory Group Feedback, City Council Feedback

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	of Governments, or Los Angeles County Bicycle Coalition (LACBC)[26] to expand existing rebate programs to help families living on low- and fixed-incomes purchase alternative modes of transportation (e.g., bicycles, scooters, rollerblades, skates, skateboards) and appropriate safety gear.					
MLU-3.5	Continue working with Metro to expand their bike-share program in San Fernando, focusing on demand near transit stations and downtown San Fernando. Promote existing resources such as Metro's "Suggest a Location"[27] tool to encourage community members to provide feedback on where new bike-share stations are needed.	CD, PW	1	Feasibility, Partnerships	N/A	Advisory Group Feedback, Equity Guardrail #1
MLU-3.6	Evaluate roadway conditions during and after extreme precipitation driven by climate change to assess flooding, drainage, and overall accessibility to schools, identifying necessary infrastructure improvements to confirm safe and reliable routes for students using nature-based solutions whenever possible	PW	1	Feasibility	Stormwater Flooding	Community Survey Results, City Council Feedback, Equity Guardrail #5
MLU-3.7	Partner with the San Fernando Police Department and the Los Angeles Unified School District to implement education and infrastructure initiatives from the City's Safe and Active Streets Implementation Plan, including bicycle safety courses for both riders and drivers, and the installation of fortified street crossings with advanced signaling, pedestrian-friendly design, and community-informed safety features at high-traffic or historically dangerous intersections.	CD, PL, PW	2	Partnerships, Education	N/A	Advisory Group Feedback, Community Survey Results, Equity Guardrail #5
MLU-3.8	Gather feedback from the community to identify locations throughout the city to install bike repair stations, including nearby parks along bicycle routes, and consider partnering with a local bike shop to provide quarterly bicycle repair support for community members traveling along a main bike path or at a designated, central location. Additionally, develop a maintenance schedule for the bike repair stations to confirm that the tools remain in good condition and items are replaced if necessary.	CD, PW	2	Structural Change	N/A	Advisory Group Feedback, Community Survey Results, Equity Guardrails #1 and 5
MLU-3.9	Partner with Metro to improve safety and accessibility on the trail along the train tracks. Improvements may include increased lighting and signage, clear crossings, stormwater capture, and additional bicycle and	CD, RC, PW	2	Partnerships	N/A	Community Survey Results, Planning

[26] Los Angeles County Bicycle Coalition. More information available at: https://www.la-bike.org/

[27] Metro Bike Share. More information available at: https://bikeshare.metro.net/suggest-a-location/

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	pedestrian safety measures such as an emergency blue light phone. Additionally, evaluate the existing trees located in the trail system to confirm that they are the appropriate trees for the location and that they have the capacity and resources to generate long-term shade for the community using this pathway. If they are not the appropriate trees, prepare a schedule to replace the trees with large-canopy shade trees that are sized appropriately for greatest amount of shade and safety.					Commission Feedback, Equity Guardrails #5
MLU-3.10	Partner with business owners along train tracks to identify interest and support the design and completion of murals completed by local artists that celebrate the community's culture and history. Use reflective paint to reduce interior building heat and enhance the trail's appeal, confirming that projects prioritize equitable engagement, amplify underrepresented voices, and foster cultural resilience in the community.	CD	2	Structural Change, Equity	Extreme Heat	Planning Commission Feedback, Equity Guardrails #3
MLU-3.11	Adopt the 2025 California Green Building Standards Code (CALGreen) voluntary reach code for non-residential projects that establishes specific pavement options, such as reflective or permeable materials, to reduce the heat island effect of sidewalks, patios, driveways, and parking lots.	CM, PW	3	Structural Change	Extreme Heat	Advisory Group Feedback. Community Survey Results

Measure MLU-4: Prepare the city for widespread zero-emission vehicle adoption by investing in universal EV charging stations (public and commercial), offering community EV education and ride-and-drive events, and promoting safe passenger and commercial EV use as vehicle costs decline.

METRICS

- % of total passenger vehicles that are zero-emission in the city
- % of total commercial vehicles are zero-emission in the city
- % of total municipal vehicles that are zero-emission
- # publicly accessible electric vehicle chargers in the city

Table 14 Measure MLU-4 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
MLU-4.1	Complete a feasibility study to evaluate opportunities for installing electric vehicle charging stations at City-owned facilities— including City Hall, Public Works Yard, parks, public parking lots, and on streetlights. The study will assess existing electrical capacity, potential grid upgrades, cost estimates, and usage potential. It will also prioritize installation in areas serving residents of multi-family housing. Deliverables could include a prioritized map of charger locations, cost estimates, and a proposed implementation schedule.	PW	1	Feasibility, Equity	N/A	Advisory Group Feedback, Community Survey Results
MLU-4.2	Conduct a municipal fleet electrification assessment to evaluate the City's current vehicle inventory, replacement schedules, and operational needs. The assessment will identify vehicles suitable for near-term replacement with electric models, determine necessary charging infrastructure at City facilities, and estimate lifecycle costs and potential savings. Based on findings, develop a phased fleet transition plan that prioritizes high-use or aging vehicles and identifies available funding and incentive programs through agencies such as the South Coast Air Quality Management District (SCAQMD) and Southern California Edison (SCE).	PW	1	Feasibility, Funding	N/A	Advisory Group Feedback
MLU-4.3	Leverage existing community events, such as the San Fernando Street Festival, holiday and cultural events, Downtown Market Nights, and opportunities to collaborate with Tribal Nations and CBOs, to host informational booths and interactive demonstrations about zero-emission vehicles and receive community feedback on EV adoption hurdles. Partner with SCE and local dealerships to showcase electric models and provide on-site assistance for incentive applications (e.g., Clean Cars 4 All). Tailor outreach to residents of multi-family buildings and low- to moderate-income households by providing multilingual materials highlighting cost savings, maintenance benefits, and rebate programs.	CM, CD, RC	1	Education, Equity	N/A	Advisory Group Feedback, Community Survey Results, Equity Guardrail #1
MLU-4.4	Collaborate with the SCAQMD and the Los Angeles County Clean Cities coalition to identify funding opportunities for small and disadvantaged business owners to transition to electric vehicles. Develop a City-supported program that assists businesses in identifying eligible grants or loans and facilitates access to technical support for installing workplace charging stations.	PW, FN	1	Partnership, Funding	N/A	Advisory Group Feedback, Equity Guardrails #2
MLU-4.5	Partner with existing gas station owners in San Fernando to encourage redevelopment or retrofitting into "mobility hubs" that provide Level 2 or DC Fast Charging stations. Streamline City permitting for such conversions by offering clear design guidelines and pre-approved site layouts. Work with SCE and regional Clean Transportation programs to connect station owners to rebates	CD, PW	2	Structural Change	N/A	Advisory Group Feedback, Equity Guardrails #5

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	and technical assistance for charger installation.					
MLU-4.6	Adopt a streamlined, over-the-counter permitting process for single-family and multi-family residential EV charger installations. Eliminate or reduce permitting fees and allow for same-day digital approval where installation meets standardized safety criteria. Develop a clear, multilingual permitting guide outlining steps, costs, and contact information to improve accessibility for residents. Explore opportunities to collaborate with Tribal Nations and local CBOs that may be providing similar services.	CD, PW	2	Structural Change	N/A	Advisory Group Feedback, Community Survey Results
MLU-4.7	Collaborate with Los Angeles County and neighboring jurisdictions to design and pilot a centralized EV Rebate Portal. The portal will integrate state, utility, and local incentives into a single platform where residents can confirm eligibility, upload documentation, and track application status. The platform will be mobile-friendly and multilingual, and the City will help promote it through community newsletters, social media, and in-person events.	CD, PW	2	Funding, Partnership	N/A	Advisory Group Feedback, Community Survey Results

BUILDINGS AND UTILITIES SYSTEM

The Buildings and Utilities System addresses energy and building resilience by reducing emissions from the built environment and enhancing community access to reliable, affordable, and carbon-free energy. Measures focus on electrification, energy efficiency, renewable integration, and workforce development, helping the City demonstrate leadership while creating local green job opportunities and healthier living conditions. Actions can be found in Table 15 through Table 18.

Measure BU-1: Support communitywide transition to carbon-free electricity by partnering with Southern California Edison and regional agencies to expand rooftop solar, battery storage, and neighborhood-scale microgrids. Improve electrical system resilience with targeted upgrades such as backup power for schools and resilience hubs, and promote demand-response programs that help residents and businesses reduce peak-time energy use and lower costs.

METRICS

- % of residential and commercial customers opted up to SCE's 100% Green Rate option
- MWh of newly installed on-site energy generation systems
- MW of newly installed on-site battery storage systems

Table 15 Measure BU-1 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
BU-1.1	Develop a multi-faceted public engagement strategy to educate the community about the benefits of and transitioning to carbon-free energy as well as opportunities to resource and implement local clean energy projects. As part of engagement efforts, facilitate a two-way dialogue to identify how the City can remove barriers and provide support for community members and business owners to transition to carbon-free electricity, while gathering feedback on local challenges and opportunities.	CD, PW	1	Education	N/A	Advisory Group Feedback, Equity Guardrails #1 and 5, Community Survey Results
BU-1.2	Address the growing risk of power outages and grid instability by pursuing federal and state resilience and clean energy funding including grants (e.g., DOE, CEC, investor-owned utilities). Establish a public–private financing program that leverages utility incentives, green bonds, and low-interest loans to deploy microgrids, battery storage, and demand response technologies in critical facilities and high-outage neighborhoods. These investments will strengthen local energy reliability, reduce dependence on the broader grid, and improve community safety during emergencies.	CM, FN, PW	1	Funding	N/A	City Council Feedback, Equity Guardrails #5
BU-1.3	Partner with SCE to explore incentives, rebates, or credits for households and businesses participating in demand response programs or adopting on-site solar energy technologies. Conduct a feasibility study to evaluate the financial, technical, and equity implications of such programs, ensuring they are accessible to the lowest-income populations.	CD, CM, PW	1	Feasibility, Partnership, Equity	N/A	Advisory Group Feedback, Community Survey Results
BU-1.4	Streamline permitting requirements for on-site solar energy + battery storage systems to increase adoption rates by implementing expedited review processes, reducing permitting costs, and adopting online application platforms. Establish clear, standardized guidelines for residential and commercial projects to make the process more accessible and predictable. Ensure that permitting processes are equitable by providing targeted support and fee reductions for low-income and disadvantaged populations.	PW, CD	1	Structural Change, Equity	N/A	Advisory Group Feedback, Community Survey Results
BU-1.5	Advance community-scale energy resilience by identifying and preparing suitable public and community-owned sites for battery storage and microgrid installations. Partner with utilities, Tribal Nations, schools, and community-based organizations to prioritize projects that strengthen power reliability for essential services such	PW, CD, RC	2	Feasibility, Partnership	N/A	Community Survey Results, Equity Guardrail #1

Action		Lead Department(s)	Phase	Pillar	Climate Hazard(s)	Consistency
	as cooling centers, emergency shelters, and critical facilities. Engage residents early in the siting process to ensure projects reflect local needs, equity priorities, and neighborhood preferences.					

Measure BU-2: Require new buildings to meet high standards for health, safety, and resilience by incorporating all-electric systems, efficient cooling, and extreme heat protections while respecting San Fernando's historic character.

METRICS

- % of new buildings that are all-electric
- % of new buildings built with heat-resilient and efficient cooling features

Table 16 Measure BU-2 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
BU-2.1	Establish a City-led "Building Decarbonization Review" as part of planning and permitting for both residential and non-residential projects. Require applicants to submit a decarbonization checklist outlining opportunities for all-electric systems, on-site renewable energy, water efficiency, and resilience features. The City will integrate this review into discretionary approvals and provide design guidance and technical support, ensuring projects advance health, safety, and carbon reduction goals even before state codes mandate them.	PW, CD	1	Structural Change	Extreme Heat	Advisory Group Feedback
BU-2.2	Update building and development standards to require high-efficiency cooling systems, reflective roofing, and enhanced insulation in all new construction. Encourage use of passive design strategies, such as natural ventilation and strategic shading, to reduce indoor heat gain. Provide design flexibility and guidance to ensure these features complement San Fernando's historic architecture, maintaining aesthetic integrity while improving thermal comfort, energy efficiency, and occupant safety during extreme heat events.	PW, CD	1	Structural Change	Extreme Heat, Poor Air Quality	Advisory Group Feedback, Community Survey Results, Equity Guardrail #3

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
BU-2.3	Create partnerships with Mission Continuation School, San Fernando Senior High School, Cesar Chavez Learning Academies, and nearby colleges such as Los Angeles Mission College and Los Angeles Valley College to align curricula and training programs with high-demand, high-road industries. Leverage City resources and work with labor unions, local businesses, Tribal Nations workforce programs, and community-based organizations (e.g., Pacoima Beautiful) to co-develop internships, apprenticeships, mentorships, and workforce readiness programs targeting BIPOC communities. Provide opportunities that are accessible through culturally relevant, multilingual outreach, with a focus on preparing students for careers in sustainable construction, clean energy, and other resilience-related fields.	RC, CD	1	Partnership, Equity	N/A	Advisory Group Feedback, Community Survey Results
BU-2.4	Promote the use of state and federal incentives specifically for residential developers, such as the California Energy Commission's Building Initiative for Low-Emissions Development (BUILD), the Affordable Housing and Sustainable Communities (AHSC) Program, and the California Electric Homes Program (CalEHP).	CM, FN	1	Funding	N/A	Advisory Group Feedback, Community Survey Results
BU-2.5	Develop a Passive Design Toolkit that provides practical guidance on strategies such as shading, window placement, natural ventilation, and landscape-based cooling. The toolkit will help architects and developers integrate passive cooling and energy-efficient design into new and renovated buildings while preserving San Fernando's historic character and enhancing neighborhood livability.	CD, PW	2	Education	Extreme Heat	Advisory Group Feedback, Community Survey Results, Equity Guardrail #3
BU-2.6	Host workforce development sessions on electrification, energy efficiency, and renewable systems for local contractors, building owners, and operators. Partner with Pacoima Beautiful and other community-based organizations to ensure outreach is multilingual, culturally relevant, and inclusive. These sessions will both share technical and financial resources and gather community feedback to refine City programs, remove participation barriers, and expand equitable access to green jobs and	CM, RC, CD	2	Education, Funding, Equity, Partnerships	N/A	Advisory Group Feedback, Equity Guardrail #1 and 5 Community Survey Results

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
	building upgrades.					

Measure BU-3: Connect building owners and renters with incentives, rebates, and education programs to upgrade existing homes and businesses, enabling them to become zero-carbon and resilient to extreme heat, flooding, and poor air quality.

METRICS

- % reduction in residential and nonresidential natural gas use compared to adjusted forecast
- # or % of residential homes retrofitted with cooling and heat-resilient features (e.g., insulation, cool roofs, energy-efficient windows, shade structures).
- % reduction in indoor $PM_{2.5}$ or NO_2 levels in pilot or case study homes.

Table 17 Measure BU-3 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
BU-3.1	Develop and adopt an ordinance establishing a maximum indoor temperature threshold for rental units, in alignment with SB 655 and California Health and Safety Code requirements. The ordinance will require landlords to maintain indoor temperatures at or below the defined threshold (e.g., 82°F, consistent with the recent Los Angeles County Board of Supervisors policy), so rental units remain safe and habitable during extreme heat events.	CM, CD	1	Structural Change	Extreme Heat	Advisory Group Feedback, Equity Guardrail #5, Community Survey Results
BU-3.2	Incorporate indoor temperature threshold compliance into the City's existing Code Enforcement and Housing Rehabilitation programs, starting with existing rental properties. Begin with outreach and voluntary compliance for property owners, supported by technical guidance and retrofit financial incentives. For new developments, integrate compliance checks during plan review and building inspection phases. Roll out enforcement gradually, prioritizing older, renter-heavy buildings, and pair compliance requirements with City or state financial assistance to prevent costs from being passed on to tenants.	PW, CD	1	Structural Change	Extreme Heat	Advisory Group Feedback, Community Survey Results
BU-3.3	Conduct a building electrification and resilience assessment to evaluate retrofit needs for energy efficiency, cooling, and health benefits in alignment with Safety Element Policies S-10.3 (Building Efficiency) and Housing Element Policy 1.4 (Rehabilitation of Residential Structures). Build on relevant	PW, CD	1	Feasibility	N/A	Advisory Group Feedback, City Council Feedback

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
	studies and case examples[28] to include data on energy burden, fuel transition and passive cooling costs, and indoor heat exposure for low-income households.					
BU-3.4	Expand housing rehabilitation support by developing a multilingual outreach program that connects landlords and tenants to incentive programs for electrification, energy efficiency, and indoor air quality. Coordinate with LA County and Pacoima Beautiful under Lead-Based Paint Awareness (Housing Element – Program 2) and Safe and Sanitary Homes (Safety Element – S-14.22–S-14.24). Leverage and expand existing tenant protection programs to tie tenant protections directly to these incentive programs, ensuring building upgrades and electrification efforts do not lead to rent increases or displacement.	CM, CD, PW	1	Structural Change	N/A	Advisory Group Feedback, Community Survey Results, Equity Guardrail #4
BU-3.5	Promote incentive programs for upgrades at multi-family homes, as well as low income and affordable housing units, including those that provide opportunities to stack existing incentives from TECH Clean California[29] funding mechanisms to connect residents to technical and financial support including direct install, incentives, and information on the benefits of electrification and passive cooling. Deploy the program in partnership with local community organizations and trusted community leaders.	CD, CM	1	Equity, Funding, Structural Change, Partnership	N/A	Advisory Group Feedback, Equity Guardrail #5 Community Survey Results
BU-3.6	Expand and strengthen the Low-Income Rate Assistance Program (LIRA) by securing additional funding through state and federal grants or local revenue sources to support new applicants. Enhance multilingual, two-way outreach by engaging directly with residents to identify enrollment barriers, gather feedback on program accessibility, and co-develop improvements that simplify participation. Evaluate options to increase subsidy levels or offset fixed service charges, ensuring all low-income households have equitable access to affordable, safe, and reliable utility service.	CM, FN, CD	1	Partnership, Feasibility, Equity	N/A	Equity Guardrail #1 Community Survey Results, City Council Feedback
BU-3.7	Streamline permitting for heat resilient retrofits by allowing over-the-counter or same-day permits for heat pumps, efficient HVACs, and window upgrades, consistent with Safety Element Policy S-10.3 (Building Efficiency) and Housing Element Program 3 (Zoning Code Update to Remove Constraints).	CD, PW	2	Structural Change	N/A	Advisory Group Feedback
BU-3.8	Create and promote DIY energy efficiency toolkits. Seek funding to create a lending library of air purifiers and cooling devices. Deploy the program in	CM, CD, RCS	2	Education, Partnership,	Poor Air Quality	Advisory Group Feedback

[28] Existing studies and case examples available at: ReWiring America, Smart Electric Power Alliance, and Urban Land Institute.

[29] More information available at: https://techcleanca.com/

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
	partnership with local community organizations such as Pacoima Beautiful and Neighborhood Watch programs (S-2.4), targeting low income and large households.			Equity		
BU-3.9	In partnership with Southern California Edison, create a local program that provides energy efficiency and weatherization support for all residents, such as energy audits and home/building assessments, and education on energy-saving behaviors and maintenance, aligning with Safety Element Policy S-14.22 (Home Maintenance Education).	CD	2	Partnership, Education	N/A	Advisory Group Feedback, Survey Results
BU-3.10	Confirm that all implementation reinforces cultural resilience by preserving San Fernando's historic identity and sense of place. Support retrofits and maintenance practices that enhance energy efficiency, reduce heat exposure, and strengthen structures against climate hazards, while maintaining historic integrity and complying with preservation standards. Work with local historians, Tribal Nations, and property owners to ensure climate adaptation investments respect traditional architectural character and community heritage.	CD,	2	Partnership, Education	N/A	Advisory Group Feedback, Equity Guardrail #3

Measure BU-4: Decarbonize City-owned buildings through energy efficiency upgrades, renewable energy integration, and electrification of key systems. Partner with local trade schools and workforce programs to train and employ residents in implementing these projects, creating green jobs and building community capacity while demonstrating City leadership in sustainability and resilience.

METRICS

- % reduction in natural gas usage from City-owned buildings
- % of buildings with improved thermal comfort (qualitative feedback)
- # of local residents trained or employed through city retrofit projects

Table 18 Measure BU-4 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
BU-4.1	Assess City-owned buildings to identify retrofit needs, renewable energy opportunities (e.g., rooftop solar at City Hall, libraries, and public works yards), and retrofit schedules. Include lifecycle cost analysis to demonstrate long-term savings and funding opportunities.	PW, CM	1	Feasibility	N/A	Advisory Group Feedback

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
BU-4.2	Pursue available funding streams such as California Energy Commission grants and South Coast AQMD incentive programs to support municipal building decarbonization. Develop a coordinated grant strategy to maximize cost savings and reduce reliance on the City's general fund.	CM, CD	1	Funding	N/A	City Council Feedback, Planning Commission Feedback
BU-4.3	Partner with SCE to implement a municipal building retrofit program that leverages available incentives and technical support. The program will target energy efficiency upgrades such as LED lighting retrofits, high-efficiency HVAC systems, smart thermostats, and weatherization measures, with the goal of lowering energy use, reducing utility costs, and addressing health and safety issues in City facilities. Implement upgrades to critical municipal facilities first (e.g., City Hall, Police).	PW, CM	2	Partnerships, Funding	Extreme Heat, Poor Air Quality	Planning Commission Feedback
BU-4.4	Create case studies and host public tours of decarbonized municipal buildings (e.g., City Hall energy upgrades or rooftop solar projects) to educate residents, local contractors, and businesses about clean technologies.	CD	2	Education	N/A	Advisory Group Feedback, Community Survey Results
BU-4.5	Require all new municipal buildings to be zero-emission, embedding decarbonization into procurement and capital planning.	CM, CD, PW	3	Structural Change	N/A	Advisory Group Feedback

URBAN ECOSYSTEM

The Urban Ecosystem centers on enhancing the city's natural infrastructure to manage heat, water, and waste sustainably. These measures integrate tree canopy expansion, water conservation, stormwater management, and organics diversion to create greener, healthier neighborhoods. Together, they strengthen San Fernando's capacity to adapt to climate hazards while promoting environmental justice and community well-being. Actions can be found in Table 19 through Table 21 below.

Measure UE-1: Enhance the resilience of San Fernando's water systems by integrating stormwater management, potable water conservation, and equitable access to sustainable water resources, confirming all residents have reliable access to clean, safe, and affordable water as a basic human right.

METRICS

- Net change in groundwater storage (acre-feet) relative to baseline year (2021)
- Number and percentage of income-qualified households enrolled in Low-Income Rate Assistance (LIRA) or similar programs
- # of square feet of drought landscape conversions completed through City programs
- # of green infrastructure projects informed by community or Tribal input

Table 19 Measure UE-1 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
UE-1.1	Enhance the resilience of San Fernando's groundwater system by investing in aquifer recharge, infrastructure modernization, and sustainable yield management. Conduct a groundwater vulnerability assessment to identify wells at risk from drought, contamination, or declining yields, and prioritize upgrades such as well rehabilitation, backup power systems, and drought-resilient pumping controls. Coordinate with Los Angeles County, Los Angeles Department of Water and Power, and the Upper Los Angeles River Area Integrated Regional Water Management Group, Tribal Nations, and community-based organizations to explore opportunities for stormwater capture and recharge projects, expanding local storage and improving water reliability under future climate conditions and increased water demand.	CM, PW	1	Structural Change, Feasibility, Partnerships	Stormwater Flooding	Advisory Group Feedback, Community Survey Results
UE-1.2	Complete ongoing monitoring of nitrate levels in the city's water supply and investigate new technologies or practices that could further improve system performance and community protection. Alongside monitoring, implement a public education program to share results transparently,	PW	1	Education	N/A	Annual Water Quality Report, Community Survey

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
	raise awareness about nitrate risks and water quality, and provide residents with resources on how they can help safeguard local water systems.					Results, Equity Guardrail #5
UE-1.3	Identify and pursue new funding opportunities to supplement existing programs and expand financial assistance for income-qualified households. Set a goal to offset at least 50% of fixed service fees, so water service remains affordable and accessible for residents most in need.	PW, FN	1	Funding, Equity	N/A	Community Survey Results, Advisory Group Feedback
UE-1.4	Expand programs through the San Fernando Water Division to modernize water efficiency and conservation measures in alignment with Programs 15 and 20 of Open Space, Conservation, Parks and Recreation Element. This includes expanding leakage detection and repair systems, promoting drought-tolerant landscaping, and encouraging the use of low-flow fixtures, fittings, and appliances. Integrate greywater capture and reuse opportunities identified under the City's feasibility studies (Program 21) and provide financial and technical assistance to landlords and low-income households to confirm equitable participation in water-saving upgrades.	CD, RC, PW	1	Structural Change, Equity	Stormwater Flooding	Community Survey Results, City Council Feedback
UE-1.5	In alignment with Programs 15 and 28 of the Open Space, Conservation Parks and Recreation Element, improve stormwater and flood infrastructure in historically flood-prone neighborhoods. Utilize community anecdotes and local Tribal knowledge to calibrate traditional data and explore nature-based solutions, such as permeable pavement, bioswales, and rain gardens in new developments and major roadway projects.	PW, RC	1	Structural Change	Stormwater Flooding	Equity Guardrail #4 and 5
UE-1.6	Continue to coordinate with neighboring jurisdictions to provide adequate water availability and peak load water supply for fire suppression efforts in alignment with CAL FIRE recommendations.	PW	1	Partnership	N/A	Advisory Group Feedback
UE-1.7	Integrate Performance and Design Criteria from the updated Water Master Plan into fire suppression planning and development review processes to confirm hydrant flows and system capacity meet maximum day demand requirements. Confirm these standards are applied consistently to maintain resilience during emergencies and future climate-driven stress events.	PW	1	Structural Change	N/A	City Staff Feedback
UE-1.8	Evaluate the feasibility of a community rebate and incentive program for climate-resilient landscaping and parcel-level stormwater	CD, PW	1	Feasibility, Education	Stormwater Flooding	Advisory Group Feedback

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
	improvements by assessing existing regional models, identifying potential funding sources (e.g., state grants, water district partnerships), and developing outreach materials, technical guidance, and contractor/landscaper resources to help residents implement features such as bioswales, rain gardens, and French drains.					
UE-1.9	Explore and evaluate progressive water rate structures that balance affordability and sustainability. To prevent inequitable impacts, engage directly with low-income and large family households and residents with high utility burdens regularly (during the rate restructuring processes as well as in standard years), confirming that their feedback informs any adjustments and that affordability remains a core outcome.	PW, FN	2	Feasibility, Equity	N/A	Equity Guardrail #1
UE-1.10	Review and update the Municipal Code and development design guidelines to strengthen requirements and incentives for low-impact development, greywater reuse, rainwater capture, and other water conservation practices. Align with Programs 15 and 21 of the Open Space, Conservation, Parks and Recreation Element by integrating these measures into zoning and site design standards, and explore the creation of pre-approved design templates for greywater and low-impact systems to streamline permitting and reduce costs for applicants.	CD, PW	2	Feasibility, Structural Change	Stormwater Flooding	Advisory Group Feedback, Community Survey Results

Measure UE-2: Increase citywide tree canopy and community-centered green spaces to reduce the urban heat island effect by supporting and implementing the strategies outlined in the Urban Forest Management Plan.

METRICS

- # of (annually and total) trees planted
- % survival rate of trees planted
- % increase in Tree Equity Score per census tract[30]
- # of acres of green space (e.g., parks, habitat nodes)

[30] Tree Equity Score. More information available at: https://www.treeequityscore.org/insights/place/san-fernando-ca

Table 20 Measure UE-2 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
UE-2.1	Amend zoning codes to integrate Urban Forest Management Plan canopy targets, requiring minimum tree canopy coverage in new developments utilizing native tree species (i.e., 30% in commercial/industrial areas, 35% in residential areas, and 40% in parks) to align with citywide shade and climate goals.	PW, CD	1	Structural Change	Extreme Heat, Poor Air Quality	Advisory Group Feedback, Urban Forest Management Plan, Community Survey Results
UE-2.2	Update the zoning code as follows: • Residential Neighborhoods: ○ **Landscaping Requirements:** Align with the City's updated landscape ordinance to support increased permeable surfaces and sustainable landscape practices. ○ **Setbacks:** Review and update to encourage climate-smart design, shade, and stormwater infiltration. ○ **Parking Requirements:** Broaden beyond parking minimums to include standards for drive aisles and permeable paving to reduce heat island impacts and stormwater runoff. • Commercial Areas: ○ **Setbacks:** Reevaluate standards to improve pedestrian safety, walkability, and integration of green infrastructure. ○ **Parking Requirements:** Replace "minimums" with flexible parking standards, including shared parking and permeable surface requirements. ○ **Landscaping Requirements:** Incorporate sustainable landscaping that reduces water demand and enhances urban greening. • Industrial Zones: ○ **Setbacks:** Review to improve buffers with adjacent uses and support stormwater management. ○ **Parking Lots:** Update requirements to include permeable paving, shading, and landscaped stormwater features.	CD	1	Structural Change	Extreme Heat, Stormwater Flooding	Advisory Group Feedback, Landscape Ordinance, Community Survey Results
UE-2.3	Implement the City's Urban Greening District and Design Standards (Programs 23 and 24 of the Open Space, Conservation, Parks and Recreation Element) by planting large-canopy native trees in public spaces and new developments, prioritizing high-shade species in	PW, RC, CD	1	Structural Change, Equity	Extreme Heat, Poor Air Quality	Advisory Group Feedback, Landscape Ordinance,

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
	pedestrian-heavy areas such as street corridors, schools, and transit stops. Confirm tree plantings are integrated with native landscaping, permeable surfaces, and stormwater management features. Engage community members in identifying and prioritizing planting locations, confirming that residents' lived experiences and local knowledge inform where trees are most needed for shade, comfort, and safety.					Community Survey Results, , Equity Guardrail #1 and 5
UE-2.4	Increase the urban forestry maintenance budget to support care, watering, pruning, pest management, and long-term health of an expanded tree canopy, particularly during periods of drought or extreme heat, by securing dedicated funding through general funds, grants, or partnerships.	PW, FN	1	Funding	Extreme Heat	Urban Forest Management Plan, Planning Commission Feedback
UE-2.5	Raise public awareness of the benefits of urban trees to public health and engage residents directly in tree planting and care. Install multilingual educational signage in parks, schools, and along major streets to highlight trees' role in reducing urban heat island effect, cooling costs, improving air quality, supporting mental health, enhancing biodiversity, and managing stormwater. Partner with the Fernandeño Tataviam Band of Mission Indians (FTBMI) through the Tribally-Informed Urban Forestry Program[31] to co-lead planting events and continue providing culturally grounded tree-care education.	PW, CD	1	Education, Equity	Extreme Heat, Stormwater Flooding	Community Survey Results, Advisory Group Feedback, Equity Guardrail #3
UE-2.6	Promote tree planting downtown through the Urban Greening District initiative by educating business owners on the economic and environmental benefits of increasing tree cover near storefronts and pairing new plantings with culturally relevant murals or public art to celebrate local identity and attract visitors.	CD, PW	1	Education, Partnerships	Extreme Heat	Advisory Group Feedback, Community Survey Results, , Equity Guardrail #2 and 3
UE-2.7	Partner with Los Angeles Unified School District and private schools to encourage and permit on-campus planting initiatives, prioritizing street tree planting near schools and within walking routes. Coordinate through Joint-Use Agreements (Program 30 of the Open Space, Conservation, Parks and Recreation Element) to confirm tree planting and green infrastructure improvements provide mutual benefits to students and the broader community. Integrate urban forestry education into school programs using on-site trees and green spaces as hands-on learning	CD, PW, RC	1	Education, Partnerships	Extreme Heat	Advisory Group Feedback, Community Survey Results

[31] Sikwa'puhawam (Greening Fields). More information can be found at: https://www.tataviam-nsn.us/community/greening-fields/

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
	tools to teach stewardship, climate resilience, and air quality improvement.					
UE-2.8	Maintain active membership with the Los Angeles Region Imagery Acquisition Consortium (LARIAC)[32] to remotely monitor compliance with tree policies and integrate new technology as it becomes available.	CM, CD, PW	1	Partnerships	N/A	Urban Forest Management Plan
UE-2.9	Expand the urban forest by planting and maintaining native climate-appropriate fruit trees. Partner with community groups, local Tribal Nations, schools, and food banks to provide proper care, safe public harvesting, and equitable distribution of fruit, while enhancing shade, biodiversity, and community resilience.	CD, RC, PW	2	Structural Change, Partnerships, Equity	N/A	Urban Forest Management Plan, Community Survey Results
UE-2.10	Support long-term tree maintenance by working with FTBMI and Tree People or similar entities to host bilingual workshops on comprehensive tree care including proper mulching techniques, pruning, seasonal watering techniques, pest and disease identification, soil health management, and leaf care practices to confirm the survival of newly planted trees as well as more mature trees. Information in this program should also include how and when to remove trees that are in poor condition or cause safety concerns.	CD, PW, RC	2	Partnerships, Education	Extreme Heat	Urban Forest Management Plan, Advisory Group Feedback
UE-2.11	Partner with Los Angeles Unified School District to convert existing asphalt play areas into green, shaded play spaces by providing permitting support, identifying grant funding opportunities, and coordinating across city departments to streamline approvals. In alignment with Program 31 of the Open Space, Conservation, Parks and Recreation Element, prioritize these projects as small-scale recreational facilities that repurpose underused spaces, incorporate native landscaping and shade structures, and enhance comfort and safety. Engage students, parents/care givers, and community members in the design process to confirm the new spaces reflect local needs and foster environmental education and stewardship.	CD, PW, RC	2	Structural Change, Partnerships	Extreme Heat	Advisory Group Feedback, Community Survey Results, Equity Guardrail #1 and 5
UE-2.12	Expand shaded routes to schools by launching a “Cool Routes to School” program that prioritizes tree planting along walking and biking routes within 0.15 miles of schools to improve safety and comfort for students.	CD, PW	2	Education, Equity	Extreme Heat	Advisory Group Feedback, Community Survey Results

[32] Los Angeles Region Imagery Acquisition Consortium. More information can be found at: https://lariac-lacounty.hub.arcgis.com/

Measure UE-3: Increase diversion of landfilled organics in San Fernando to achieve compliance with SB 1383 by expanding food scrap and green waste collection, using recovered organic waste products locally, and partnering with schools and nonprofits to recover surplus edible food for residents.

METRICS

- % reduction in organic material sent to landfill compared to 2014
- Tons of recovered organic waste product procured per year
- Tons of edible food donated to residents per year

Table 21 Measure UE-3 Actions

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
UE-3.1	Work with Republic Services to provide multilingual, audience-specific education on what materials belong in the organics, recycling, and trash bins, and how to properly compost at home or on-site. Develop clear visual guides and short demonstrations for residents (e.g., what goes in kitchen pails and curbside bins) and businesses (e.g., proper separation and bin maintenance). Distribute materials through the city permit counter, grocery stores, schools, farmers' markets, and community events to boost participation and reduce contamination	CD, PW, CM	1	Education, Partnerships	N/A	Advisory Group Feedback, City Council Feedback,
UE-3.2	Work with regional partners, such as LA Compost and Cottonwood Urban Farm, to establish or facilitate access to a local community compost hub where residents can drop off their organic waste in return for finished compost, attend compost workshops/events, and/or volunteer and connect with the community.	CD, PW	1	Partnership, Structural Change	N/A	Advisory Group Feedback
UE-3.3	Develop a targeted outreach program for multi-family properties to understand opportunities and barriers to composting and green waste collection. Conduct bilingual engagement with property managers and tenants to gather input on logistics, space constraints, and participation needs. Use this feedback to shape a practical multi-family composting program with clear guidance, bin placement strategies, and support resources.	PW	1	Education, Feasibility, Equity	N/A	Advisory Group Feedback, Equity Guardrail #1
UE-3.4	In alignment with S-14.16 of the Safety Element, partner with FTBMI, Tribal Conservation Corps, Los Angeles Unified School District, the Las Palmas Parks Gardening Club, and other interested parties to develop and	CD, RC, PW	1	Partnerships, Structural Change, Equity	N/A	Advisory Group Feedback, Equity

Action		Lead Department(s)	Phase	Pillar	Climate Hazard	Consistency
	maintain new community gardens to increase access to fresh produce, enhance green spaces, and foster community resilience.					Guardrail #5, Safety Element
UE-3.5	Enhance food recovery capacity planning by estimating the amount of edible food disposed of by Tier 1 and Tier 2 generators, streamlining collection and distribution logistics through coordinated route planning and real-time monitoring, and partnering with organizations such as MEND Poverty, St. Ferdinand Church, Lighthouse of San Fernando, La Voz Sylmar SDA Church, Making it Happen Inc., and the Los Angeles Conservation Corps to identify the capacity needed to recover at least 20% of edible food currently wasted. Provide education on the Good Samaritan Law and storage infrastructure needs, and prepare an implementation schedule to expand facilities and recovery operations if needed.	CD, PW	1	Feasibility, Partnerships	N/A	Advisory Group Feedback, Community Survey Results
UE-3.6	Partner with entities such as Agromin to meet City's SB 1383 procurement target of 1,980 tons[33] of recovered organic waste product per year. Prioritize applying locally produced compost in city parks and landscaped areas to enhance soil health, water retention, and stormwater filtration while supporting circular, community-based organics management.	CD, PW	1	Feasibility, Structural Change	Stormwater Flooding	Advisory Group Feedback, Community Survey Results
UE-3.7	Develop an Implementation Record Tracking System pursuant to SB 1383 to document compliance with organics recycling and edible food recovery requirements. The system will track key metrics such as program participation, recovered edible food volume, procurement of recovered organic waste products, inspection results, and enforcement actions. Coordinate with Republic Services and local food recovery organizations to streamline data collection and reporting. Confirm records are updated annually, easily auditable, and accessible for CalRecycle review.	CD, PW	1	Structural Change	N/A	Advisory Group Feedback

33 CalRecycle Procurement Target for the City of San Fernando, valid until 2027. More information available at: https://calrecycle.ca.gov/organics/slcp/procurement/recoveredorganicwasteproducts/

I. HOUSEHOLD CLIMATE ACTION AND RESILIENCE PLAYBOOK

One of the main goals of the CARP is to bring awareness to sustainability in the community across all sectors and provide information about what individuals can each do today to make a difference and set our community on the path towards a more sustainable future with significant GHG emission reductions.

As a resident or visitor of San Fernando, individuals can also create direct change by making conscientious choices and actively engaging in sustainable initiatives. The Playbook provides ten example actions that individuals can take to be more sustainable and reduce their personal GHG emissions in the short term. For additional actions that you can take that will reduce your GHG emissions, see the Climate Action and Resilience Strategies section.

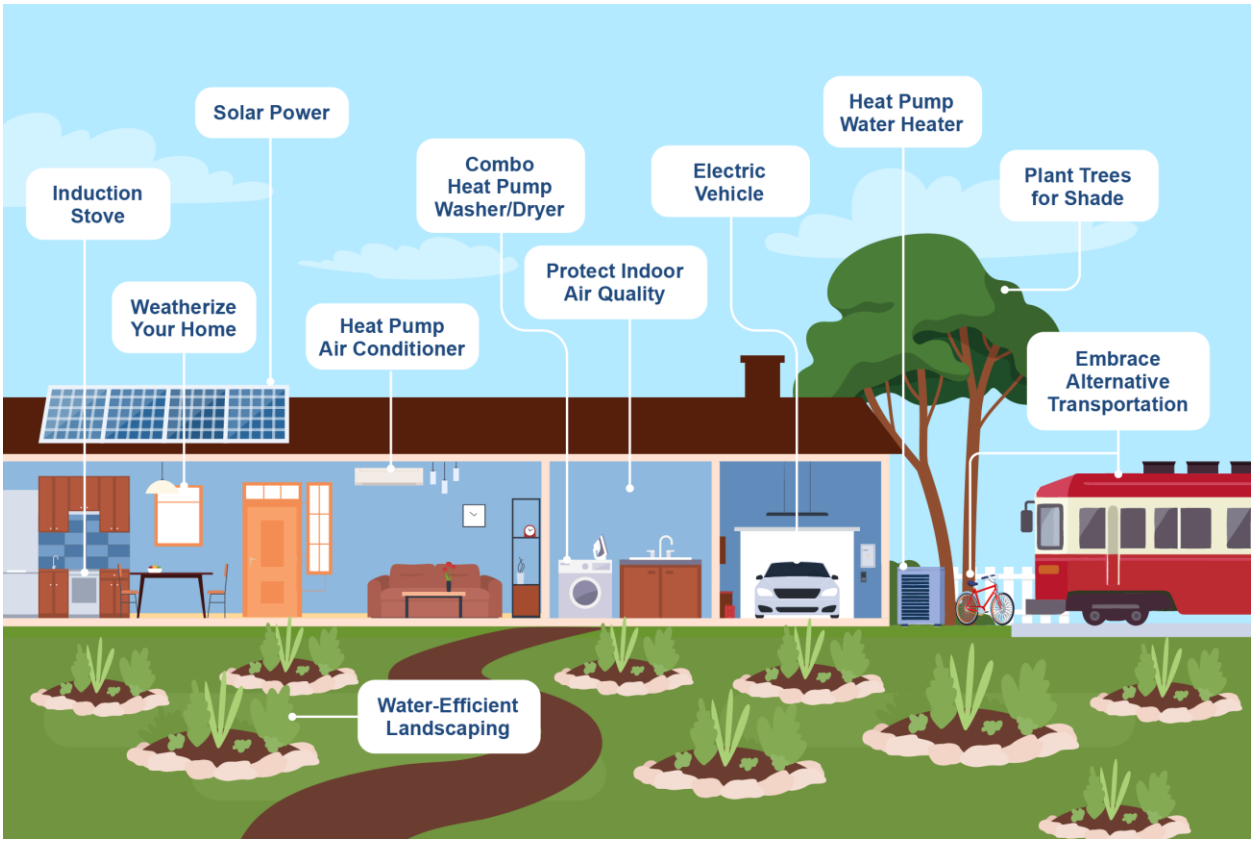
YOUR CHOICES MAKE A DIFFERENCE!

Over 40 percent of emissions generated by the United States are the cause of a few "kitchen table" decisions that individual consumers make. The cars people drive and the appliances that heat water, homes, food, and dry clothes together make up 42 percent of all emissions in the country.[34] The good news is that this plan provides clear, cost-effective steps to bring these emissions to zero with today's technology. But climate action is not just about reducing emissions—it's also about strengthening our homes and communities against the impacts of extreme weather, power outages, and rising costs.

This playbook lays out key steps to help families make climate-smart, kitchen-table decisions that can improve household health, strengthen community well-being, and potentially save money over the long term. By electrifying homes and vehicles, investing in home weatherization, incorporating backup power solutions, and preparing for climate risks, households can build a future that is both sustainable and resilient to a changing climate. See Figure 26 and the descriptions below for opportunities to instill climate action and resilience within the household.

[34] https://www.rewiringamerica.org/research/whats-at-stake-fact-sheet

Figure 26 Household Climate Action and Resilience Opportunities



THE PLAYBOOK

When you own your home or building, you have the ability to make sweeping changes to how you use energy, impact the climate, and respond to the climate. Follow the steps below to learn more about the technical support and thousands of dollars in rebates and tax credits available in San Fernando for electrification, home weatherization, and energy resilience. While renters have less direct control over their buildings than building owners, there are still lots of great ways renters can help meet San Fernando's climate goals, improve air quality in their homes, and even save money. Check out Rewiring America's electrification for renter's guide for a step-by-step guide designed just for renters.

For building owners, the best time to replace many of these appliances is when the existing one is at the end of its useful life. However, a lot of building electrification decisions can take a little time and planning so be sure to start making an electrification plan so that when your water heater inevitably fails at the worst possible moment, all the pre-wiring and other steps are already taken care of. In some cases (like water heaters) there are enough incentives to cover the full cost of replacement today, making switching early an attractive and financially smart choice. To make an electrification plan visit Rewiring America today.

MAKE YOUR NEXT CAR AN ELECTRIC VEHICLE

Transportation is the largest contributor to San Fernando's emissions and switching to an electric vehicle (or utilizing alternative modes of transportation) can significantly reduce these emissions. Electric vehicles (EVs) are more cost effective than ever, and many vehicles have lower lifecycle costs than their gas counterparts. Check out this analysis from the Massachusetts Institute of Technology for more information

on the total cost of owning a vehicle here. Once fuel and maintenance is added into the cost, electric vehicles often come out on top. Plus, there are state incentives available that can help lower the cost of purchasing an electric vehicle, with additional benefits for income-qualified buyers. To learn more about available incentives, click here. With the City of San Fernando focusing on deploying more EV chargers than ever, there has never been a better time to switch to an EV for your next vehicle purchase. Renters can sometimes have less access to at home charging, which is why the City of San Fernando's CARP is emphasizing the expansion of multi-family charging while also providing access to DC fast charging around the city. DC fast charging allows EVs to charge much more quickly than standard chargers, often adding hundreds of miles of range in just 20–30 minutes. With many EV's getting over 300 miles on a single charge, a single 30-minute charge can be enough to power many people's daily driving needs for days at a time.

EMBRACE ALTERNATIVE TRANSPORTATION

Owning a car isn't the only way to get around San Fernando, and choosing alternative transportation can significantly reduce emissions while saving you money. Walking, biking, public transit, and carpooling are all great ways to cut down on personal vehicle use. San Fernando's public transit system continues to expand, offering convenient and affordable options for daily commutes. The City is also investing in safer bike infrastructure and pedestrian-friendly streets to make active transportation more accessible. If you're looking to reduce your reliance on a car, explore San Fernando's FREE trolley service and on-demand shuttle service, Metro pass discounts, and regional Metrolink services. Even swapping a few car trips per week for public transit, biking, or walking can make a big difference in reducing emissions and improving local air quality.

SWITCH YOUR AIR CONDITIONER AND GAS FURNACE TO A HEAT PUMP

Making the switch to a heat pump HVAC unit can provide multiple benefits to your home. Not only are they incredibly efficient, but one heat pump unit provides both heating and cooling. That means if you need to replace both your furnace and your AC unit, picking a heat pump will save you money. In addition, if you are thinking of adding an AC unit, installing a heat pump will be a similar cost and will provide both heating and cooling options. Check out the Switch Is On for more information on Southern California Edison's No Cost Electrification Program. Renters can switch to an electric space heater or better yet, use this guide from Rewiring America to talk to your landlord about the benefits of electrification.

SWITCH YOUR WATER HEATER FROM GAS OR ELECTRIC RESISTANCE TO A HEAT PUMP

Switching your water heater from electric resistance or gas to a high efficiency heat pump water heater might be the easiest climate smart action a household can take. Heat pump water heaters are over 400 percent efficient, saving you money on your bills. There are thousands of dollars in rebates available to make the switch. Some households can currently receive a new heat pump water heater at no cost after rebates. However, these rebates won't last forever. Check out The Switch Is On for more information and make the change today! Renters can encourage their landlords to update their buildings using this useful guide from Rewiring America.

FOR YOUR NEXT STOVE, GO WITH INDUCTION

While gas stoves consume a smaller amount of natural gas compared to your furnace or water heater, gas stoves are responsible for a large share of air pollutants found in your home. Recent studies on natural gas

and propane burning stoves have shown that these appliances increase exposure to nitrogen dioxide which can intensify asthma attacks and have been linked to decreased lung development in children and early deaths.[35] Switching to an induction stove eliminates nitrogen dioxide emissions while providing the same high degree of heat control that home chefs love about gas. Induction stoves work with any type of steel cookware and can heat water significantly faster and more efficiently than gas. Rebates for induction stoves are also available and can be found at The Switch is On. Renters can make the switch to induction as well! Many companies provide plug in mobile versions of their induction cooktops including these three recommended by Wirecutter.

SWITCH YOUR GAS DRYER TO A COMBINATION HEAT PUMP WASHER/DRYER

The dryer is another commonly gas-powered appliance that can be electrified. Options for electrified dryers include electric resistance (fast, but high energy use), heat pump (a bit slower to dry but very efficient), and combined water/heat pump dryer units (again slow, but the unit will both wash and then dry without switching the clothes allowing it to run by itself over night or while you're at work). Each of these units will help save that last bit of natural gas from your home. Other benefits include ventless operation, so no exhaust fumes enter your home. Fewer incentives have been available for these units, but continue to check The Switch is On for up-to-date information.

For an even more energy-efficient option, consider line drying your clothes whenever possible. Hanging clothes to dry indoors or outdoors not only eliminates energy use but also helps extend the life of your fabrics. Even if you don't switch to an electric dryer, incorporating line drying into your routine can meaningfully reduce household energy consumption.

INVEST IN SOLAR POWER AND BATTERY BACKUP

Solar power, especially when paired with a battery backup, can become the powerhouse of your home providing significant resilience benefits as well as lowering your monthly energy costs. An all-electric home powered by solar and battery (or even powered by your electric vehicle with a vehicle to home charger) can operate almost independently from the grid. Rewiring America has an incentive calculator to help you understand the incentives available to you.

WEATHERIZE YOUR HOME FOR EXTREME HEAT (AND COLD)

As climate change intensifies, extreme weather events are becoming more frequent, making home weatherization a critical step toward resilience. Sealing air leaks, adding insulation, and installing energy-efficient windows can help maintain comfortable indoor temperatures while reducing energy costs. Weatherization also helps homes stay cooler during heat waves and retain warmth during cold spells, reducing reliance on heating and cooling systems. Plant a native shade tree near your home to reduce your reliance on air conditioning. Many local and state programs offer rebates and incentives to help offset the cost of these upgrades, such as 211 LA County and The California Department of Community Services and Development's Weatherization Assistance Program.

UPGRADE TO WATER-EFFICIENT APPLIANCES AND LANDSCAPING

With increasing drought risks, conserving water is more important than ever. Simple upgrades like high-efficiency toilets, weather-based irrigation controllers, and drought-tolerant landscaping can significantly

[35] https://news.stanford.edu/stories/2024/05/people-with-gas-and-propane-stoves-breathe-more-unhealthy-nitrogen-dioxide

reduce household water use. Programs like SoCal Water$mart offer rebates for water-saving devices, making it easier and more affordable to upgrade your home. These rebates can help offset the cost of installing water-efficient appliances, rain barrels, or turf replacement projects. Check out the available rebates here to see how you can save water and money while making your home more climate-resilient.

PLANT TREES FOR SHADE AND STORMWATER MANAGEMENT

Trees provide natural cooling, reduce urban heat islands, and help manage stormwater runoff by absorbing excess rainwater. Planting shade trees strategically around your home (and neighborhood!) can lower indoor temperatures and reduce the need for air conditioning. Additionally, trees with deep root systems can help prevent erosion and urban stormwater flooding. The City of San Fernando periodically offers free or discounted trees to residents, and community tree-planting events, as part of urban greening initiatives. FTBMI has a FREE residential tree planting program for two census tracks in the city. Check your eligibility here. Click here to get updates on upcoming tree-planting events (and all the city's latest news and events) through the City's social media and notification channels.

PROTECT INDOOR AIR QUALITY

Keeping indoor air clean and safe is one of the most effective ways to protect your health during poor air quality days, whether from wildfire smoke, dust, or high ozone levels. Start by sealing off outdoor air—close windows and doors and use a high-efficiency filter in your HVAC system (MERV 13 or higher) or a portable HEPA air purifier. Designate one room, such as a bedroom or living space, as a "clean air zone," where you can use a purifier and keep the room sealed during smoke events. Replace filters every three to six months, particularly after wildfire smoke or heavy pollution days. When outdoor air quality improves, ventilate your home by opening windows or using exhaust fans to remove indoor pollutants. To reduce indoor emissions, avoid burning candles or incense and use ventilation while cooking.

Community members can track real-time air quality using AirNow.gov or the *South Coast Air Quality Management District* (SCAQMD) "Air Quality" app. For those seeking additional support, *211 LA County* offers information on free or discounted HEPA purifiers and weatherization programs for income-qualified households. The *SCAQMD Clean Air Assistance Program* provides filters, purifiers, and replacement parts to residents during smoke and pollution events. By combining these simple home strategies with available community resources, San Fernando residents can protect their indoor environments and maintain healthy air even when outdoor conditions deteriorate.

J. IMPLEMENTATION AND MONITORING

The San Fernando CARP serves as the City's roadmap for advancing toward State greenhouse gas (GHG) reduction targets. However, the plan will need to be revisited and updated over time to confirm progress toward achieving carbon neutrality by 2045. Although the plan is designed to meet long-term goals, it acknowledges the uncertainties related to technological advancements, new state legislative mandates, and climate science. Regular monitoring and updates will allow the City to adapt to new developments, refining actions as needed. Therefore, this plan should be viewed as a strategic framework that will be reevaluated every five years. This section outlines the City's approach to engaging the community through ongoing outreach and education, evaluating costs, and establishing a framework for monitoring progress

and implementing the plan over time including gathering feedback from community members to understand how implementation is impacting them and adjusting strategies as needed.

ONGOING COMMUNITY ENGAGEMENT

Ongoing community engagement for the CARP is crucial to successful implementation. The City will need to continue identifying and removing implementation hurdles and empowering residents, businesses, and interested parties to take meaningful climate action. Active and continuous engagement with residents, businesses, and other interested parties will support widespread knowledge of the plan within the community as well as identify any issues or hurdles to implementation. One of the most significant benefits of this engagement is the ability to identify potential hurdles early on—whether that be logistical, financial, or social—that could hinder the effective adoption of climate actions. For example, co-creating a multilingual communication plan with community representatives to confirm all residents can access resilience hub and emergency information, or gathering input during Walk-to-School events, will strengthen implementation across all CARP systems. This ongoing dialogue will help the City adapt programs over time, build trust, and confirm that climate actions remain equitable, responsive, and grounded in community needs. In addition to identifying and overcoming obstacles, ongoing engagement empowers individuals and organizations to take meaningful climate action. Through workshops, public forums, and partnerships, the City will foster a sense of collective responsibility and encourage active participation in broader sustainability goals.

Effective community education fosters long-term behavior change and resilience by providing residents with accessible information and resources on energy efficiency, sustainable transportation, waste reduction, water conservation, and climate adaptation measures such as emergency preparedness and extreme heat safety. By maintaining regular communication, the City can continuously raise awareness, highlight progress, and adapt to emerging challenges or opportunities in climate action and resilience.

Meaningful progress is best achieved through collaborative partnerships with local organizations, Tribal Nations, schools, businesses, and community leaders. The City's engagement efforts will aim to strengthen these relationships and build new ones; for example, establishing formal agreements (e.g., Memorandum of Understanding) between community-based organizations and resilience hub operators to coordinate training, share resources, and manage emergency operations. This type of collaboration will help shape strategies, increase participation in CARP-related initiatives, and drive measurable outcomes in emissions reductions and resilience-building projects.

In order for the CARP to remain a dynamic, living document, responsive to feedback and evolving community needs, the City will maintain an ongoing dialogue with San Fernando’s residents and key interested parties. Such efforts will enhance the overall effectiveness of the city’s climate action efforts.

COST CONSIDERATIONS

While some of the city’s measures are already budgeted for and underway, other measures will need additional staff time, support from technical experts, and funding or financing. Action costs vary widely across the CARP and while many actions are low to no cost, other infrastructure-related projects like microgrids and bike lanes can require significant upfront funding. In addition, project costs can change over time based on advancements in technology or project specifics. For example, the cost of EVs is expected to decrease as battery technology improves and manufacturing scales up, making them increasingly affordable for households and fleets. In parallel, emerging financing mechanisms, such as on-bill financing and green loans can help offset high upfront costs, allowing participants to realize steady monthly savings while transitioning to cleaner technologies. Many tools exist for cities to cover upfront costs including federal and state grants, low-interest financing, bonds, and public/private partnerships. In addition, the City plans to revise internal protocols and procedures to integrate a climate and equity perspective into government operational decision-making, prioritizing increased investments in CARP implementation.

Throughout the development of this CARP, the costs of action to the City and the community at large were a primary consideration used to identify the priority measures and actions. These costs (and in many cases long-term savings) were balanced with the cost of inaction on climate. At the center of this plan is the knowledge that the world is changing, and investment today will save both dollars and lives in the future. Below is a summary of the cost considerations that were made during the development of the CARP. A detailed description of funding and financing mechanisms for specific measures can be found in Appendix E, Funding and Financing.

THE COST OF CLIMATE CHANGE

Despite the complexity of understanding the true impact of climate change and the cost to both mitigate and adapt, economists and scientists around the world recognize that the cost is already high and will continue to increase the longer we wait to act.[36] The current numbers are already staggering. According to the United States Global Change Research Program (USGCRP), extreme weather events conservatively cost the United States approximately $150 billion each year (over $17 million per hour), a figure that does not account for loss of life, healthcare-related costs, or damages to ecosystem services.[37] Numbers in the billions and trillions are hard to conceptualize, however, when talking about the impacts of climate change, it is anticipated that damage from climate change could cost $38 trillion per year globally by the middle of the century (2050).[38] In October 2024, the United States Department of Treasury released a report titled The Impact of Climate Change on American Household Finances, which states that 13 percent of Americans reported economic hardship from disasters or severe weather events in the previous year.[39] Recent analysis also shows that for every increase of 1°C, we will experience a 12 percent loss in global gross domestic product (GDP), with losses peaking only six years after the higher temperature is recorded.

THE COST OF INACTION

The cost of not taking action to address the effects of climate change is high. In 2024, Los Angeles County conducted a climate cost study[40] that highlights the financial and social implications of climate change across the Los Angeles region, emphasizing the need for urgent action to build climate resilience. As climate-related disasters in Southern California become increasingly severe each year, it is crucial for communities to invest in a diverse array of climate adaptation and resilience initiatives, further underscoring the importance of this CARP. Key highlights from the study can be found in Figure 27 below, in addition to estimated costs following the 2025 Palisades and Eaton fires[41].

[36] https://www.eea.europa.eu/publications/assesing-the-costs-and-benefits-of#:~:text=Key%20messages,the%20implementation%20of%20adaptation%20measures.

[37] https://nca2023.globalchange.gov/

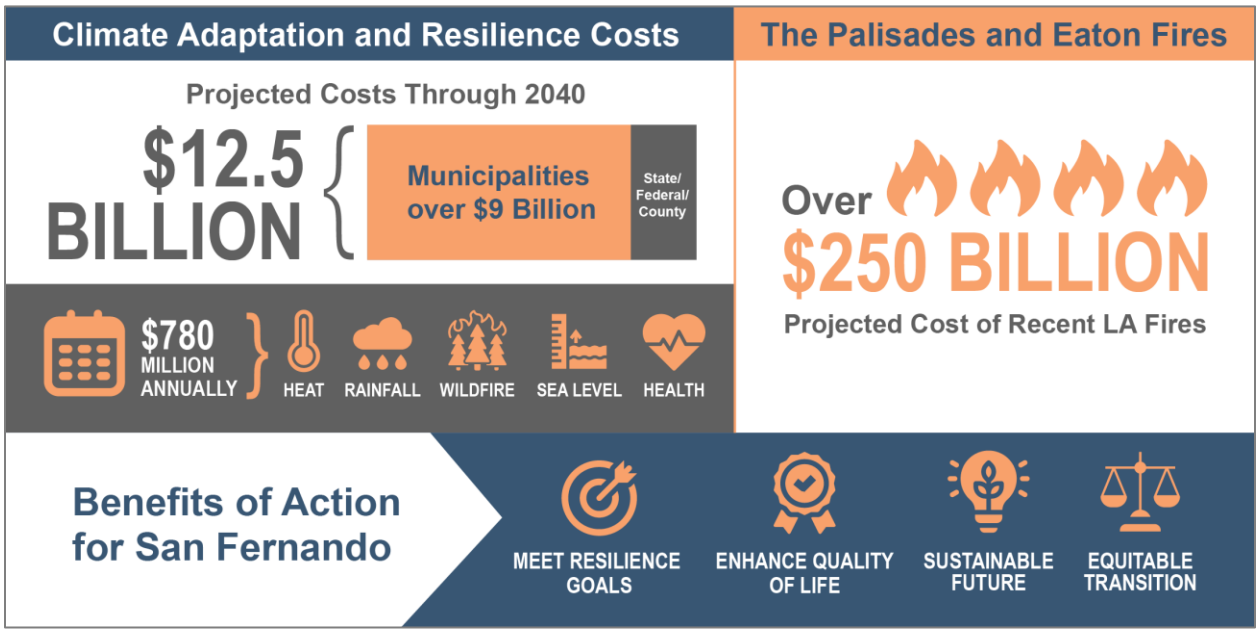
[38] https://www.reuters.com/business/environment/climate-change-damage-could-cost-38-trillion-per-year-by-2050-study-finds-2024-04-17/

[39] https://home.treasury.gov/system/files/136/Climate_Change_Household_Finances.pdf

[40] https://climateintegrity.org/projects/climate-costs-studies/los-angeles-county

[41] https://www.latimes.com/business/story/2025-01-24/estimated-cost-of-fire-damage-balloons-to-more-than-250-billion

Figure 27 The Cost of Inaction



FUNDING AND FINANCING

The Funding and Finance Strategy, found in Appendix E, outlines potential pathways to secure the capital needed to implement key measures in the CARP. It identifies a range of funding types—including grants, loans, bonds, and partnerships—along with specific programs, potential partners, and illustrative case examples to guide implementation. This strategy provides a roadmap for leveraging local, state, and federal resources, as well as private-sector and philanthropic support, to advance the City's climate goals and build long-term resilience.

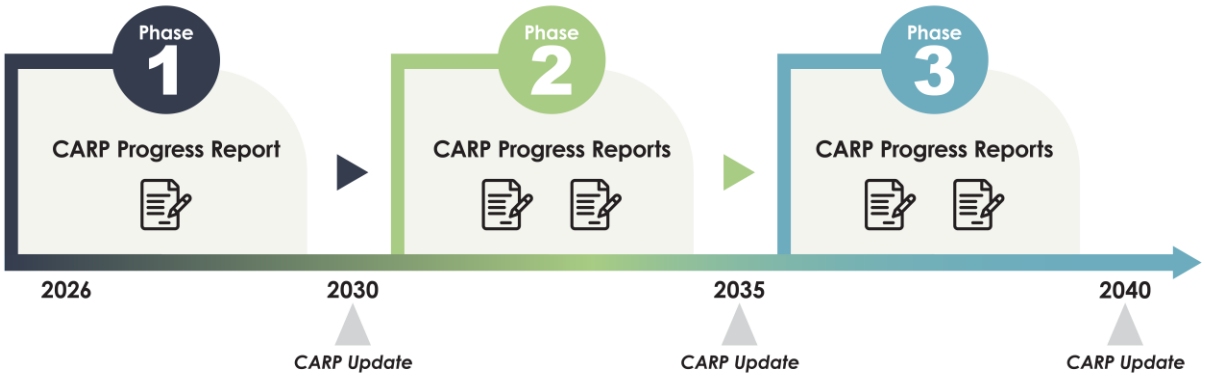
CARP IMPLEMENTATION

The City has developed an implementation plan that outlines the steps, timelines, and resources required to achieve the measures and actions of the CARP. Some actions such as optimizing the San Fernando trolley network can be done on a short timetable; while others, such as full implementation of the Urban Forestry Management Plan, will require longer timelines for both rollout of the natural landscapes and use by the community. Table 8 through Table 21 in the Climate Action and Resilience Strategies section provide information on the department responsible for implementing the action and the phase in which the initiative will be implemented, while Appendix E, Funding and Financing outlines funding and financing sources for key measures and actions. The timeline in Figure 28 shows the implementation and monitoring schedule, with a phased approach to measure implementation.

To strive for 2030 GHG emissions reductions targets discussed in the California's GHG Emissions Targets section, the City will need to begin implementing the measures and actions immediately following adoption, no later than December 2026. CARP Updates will follow the phased implementation approach, beginning with Phase 1, which will occur in the short term over the next three years (2026 – 2028). Phase 2 would include implementation of the mid-term measures, while Phase 3 would include implementation of the longer-term measures that are anticipated to occur after feasibility studies are complete and initial measures are implemented. If the actions identified in the CARP are not implemented or subsequent GHG inventories

don't track progress towards the 2030 and 2045 targets, additional actions will need to be developed and adopted in a CARP update.

Figure 28 CARP Implementation and Monitoring Schedule



MONITORING AND UPDATES

Monitoring and reporting are essential to confirming accountability and transparency in achieving the City's adopted climate goals. As part of the CARP, the City will prepare a biennial progress report and conduct a comprehensive CARP review and update every five years. Bi-annual progress reports will evaluate implementation against defined performance metrics for each measure (see Table 8 through Table 21 in the Climate Action and Resilience Strategies section) and include an updated communitywide GHG emissions inventory.

Existing city departments will collaborate to track progress, collect data, and assess outcomes—documenting both successes and any unintended impacts of implementation. To promote transparency, progress updates, key findings, and implementation dashboards will be publicly shared through the City's website, newsletters, social media, and community meetings to keep residents informed and engaged. Based on these annual reports, the City Council will review progress and provide policy guidance to confirm effective, equitable, and continuous implementation of the CARP.

ADAPTIVE MANAGEMENT

The City will adjust resilience and mitigation measures, or change the implementation strategy, when certain findings are made during the CARP's five-year review cycle. These findings are based on the U.S. EPA Regional Resilience Toolkit, a guide for local governments on increasing resilience to natural hazards. Adjustments may occur when:

- The strategies were successfully implemented, and new priorities are needed.
- Implementation is not achieving the results expected.
- The strategy has unintended consequences.
- Funding has changed.
- Political and/or public priorities have changed.
- New climate science data is available.
- Other significant changes in the environment or circumstances occur.

During the CARP review cycle, the CARP will also undergo a comprehensive update to incorporate new climate science and projections, shifting community priorities and regulatory mandates, evolving best practices, and advances in technology. Each update will include engagement with the San Fernando community.

By committing to annual monitoring of implementation progress and adjusting where necessary, San Fernando can rise to meet the local and global imperative of reducing GHG emissions. In the process of meeting that challenge, the community will benefit from the supplemental health, resilience, and other co-benefits of the GHG emissions reduction measures. This plan marks another major milestone in the City's commitment to a sustainable future.

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Appendix A

California Regulatory Framework

Climate Change Legislation Summary

As the impacts of climate change become more apparent, numerous strategies to reduce greenhouse gas (GHG) emissions have been developed at the international, state, regional, and local levels of government. This appendix provides an overview of the key legislation, regulations, and planning frameworks that guide climate action in the City of San Fernando

International Climate Action Guidance

United Nations Framework Convention on Climate Change (1992)

The primary international regulatory framework for GHG reduction is the United Nations Framework Convention on Climate Change Paris Agreement (UNFCCC). The UNFCCC is an international treaty adopted in 1992 with the objective of stabilizing atmospheric GHG concentrations to prevent disruptive anthropogenic climate change. The framework established non-binding limits on global GHG emissions and specified a process for negotiating future international climate-related agreements.[1]

Kyoto Protocol (1997)

The Kyoto Protocol is an international treaty that was adopted in 1997 to extend and operationalize the UNFCCC. The protocol commits industrialized nations to reduce GHG emissions per country-specific targets, recognizing that they hold responsibility for existing atmospheric GHG levels. The Kyoto Protocol involves two commitment periods during which emissions reductions are to occur, the first of which took place between 2008-2012 and the second of which has not entered into force.[2]

The Paris Agreement (2015)

The Paris Agreement is the first-ever universal, legally binding global climate agreement that was adopted in 2015 and has been ratified by 190 countries worldwide.[3] The Paris Agreement establishes a roadmap to keep the world under 2° C of warming with a goal of limiting an increase of temperature to 1.5° C. The agreement does not dictate one specific reduction target, instead relying on individual countries to set nationally determined contributions (NDCs) or reductions based on GDP and other factors. According to the International Panel on Climate Change (IPCC) limiting global warming to 1.5° C will require global emissions be reduced through 2030 and hit carbon neutrality by mid-century.[4]

Glasgow Climate Pact (2021)

The Glasgow Climate Pact[5] (Pact) was adopted by nearly 200 nations in 2021 and builds on the 2015 Paris Agreement. The Pact includes an agreement to revisit the emissions reduction plans to keep the 1.5°C target achievable and is the first global climate agreement that commits to phasing down the use of unabated coal. Further, the Pact includes a commitment to provide climate finance to developing countries.

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1 United Nations Framework Convention on Climate Change (UNFCCC). United Nations Framework Convention on Climate Change. https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf
2 UNFCCC. What is the Kyoto Protocol? https://unfccc.int/kyoto_protocol
3 UNFCCC. Paris Agreement - Status of Ratification. https://unfccc.int/process/the-paris-agreement/status-of-ratification
4 IPCC. Global Warming of 1.5 C. https://www.ipcc.ch/sr15/
5 UNFCCC. Glasgow Climate Pact. https://unfccc.int/documents/310475

Intergovernmental Panel on Climate Change's Sixth Assessment Report (AR6) (2021)

The Intergovernmental Panel on Climate Change's Sixth Assessment Report (AR6)6 is the most comprehensive global synthesis of climate science to date. AR6 concludes with high confidence that human influence has unequivocally warmed the atmosphere, ocean, and land, leading to widespread and rapid changes in the climate system. The report outlines the escalating risks associated with continued warming, including more frequent extreme weather events, sea-level rise, ecosystem disruption, and increasing impacts on human health and livelihoods. AR6 emphasizes that every fraction of a degree matters, with the severity of climate-related risks increasing substantially between 1.5°C and 2°C of warming. The report also identifies feasible, cost-effective mitigation pathways capable of limiting warming, noting that achieving global net-zero CO_2 emissions by mid-century is essential to stabilize the climate. According to AR6, immediate, deep, and sustained reductions in greenhouse gas emissions, paired with strengthened adaptation efforts, are critical to securing a livable future.

California Regulations and State GHG Targets

California remains a global leader in the effort to reduce GHG emissions and combat climate change through its mitigation and adaptation strategies. With the passage of Assembly Bill (AB) 32 in 2006, California became the first state in the United States to mandate GHG emission reductions across its entire economy. To support AB 32, California has enacted legislation, regulations, and executive orders (EO) that put it on course to achieve robust emission reductions and address the impacts of a changing climate. The following is a summary of executive and legislative actions most relevant to the City of San Fernando's Climate Action and Resilience Plan (CARP).

Disaster Mitigation Act (2000)

The Federal Emergency Management Agency (FEMA)'s Disaster Mitigation Act intends to "reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters." [7] Under this legislation, state, tribal, and local governments must develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance through the Hazard Mitigation Assistance Program.[8]

Senate Bill 1078 (2002)

In 2002, (Senate Bill) SB 1078 established the California Renewables Portfolio Standards (RPS) Program and was accelerated in 2006 by SB 107, requiring that 20 percent of retail electricity sales be composed of renewable energy sources by 2010. EO S-14-08 was signed in 2008 to further streamline California's renewable energy project approval process and increase the State's RPS to the most aggressive in the nation at 33 percent renewable power by 2020.

Assembly Bill 1493 (2002)

In 2002, the California State Legislature enacted Assembly Bill 1493 (aka "the Pavley Bill"), which directs CARB to adopt standards that will achieve "the maximum feasible and cost-effective reduction of GHG

6 Intergovernmental Panel on Climate Change's Sixth Assessment Report (AR6). https://www.ipcc.ch/assessment-report/ar6/
7 Federal Emergency Management Agency (FEMA). Disaster Mitigation Act of 2000. https://www.fema.gov/sites/default/files/2020-11/fema_disaster-mitigation-act-of-2000_10-30-2000.pdf
8 FEMA. Hazard Mitigation Assistance Grants. https://www.fema.gov/grants/mitigation

emissions from motor vehicles," considering environmental, social, technological, and economic factors. In September 2009, CARB adopted amendments to the "Pavley" regulations to reduce GHG emissions in new passenger vehicles from 2009 through 2016. The Pavley Bill is considered to be the national model for vehicle emissions standards. In January of 2012, CARB approved a new emissions control program for vehicle model years 2017 through 2025. The program combines the control of smog, soot, and GHGs and the requirement for greater numbers of zero emission vehicles into a single package of standards called Advanced Clean Cars.

Executive Order S-3-05 (2005)

EO S-3-05 was signed in 2005 establishing statewide GHG emissions reduction targets for the years 2020 and 2050. The EO calls for the reduction of GHG emissions in California to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The 2050 emission reductions target would put the State's emissions in line with the worldwide reductions needed to reach long-term climate stabilization as concluded by the IPCC *2007 Fourth Assessment Report*.

Assembly Bill 32 (2006)

California's major initiative for reducing GHG emissions is outlined in AB 32, the "California Global Warming Solutions Act of 2006," which was signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions.

Based on this guidance, CARB approved a 1990 statewide GHG baseline and 2020 emissions limit of 427 million metric tons of CO_2 equivalent (MMT CO_2e). The Scoping Plan was approved by CARB on December 11, 2008, and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards,[9] and Cap-and-Trade) have been adopted since approval of the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2014 Scoping Plan update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 statewide goals. The update highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the State's longer-term GHG reduction strategies with other State policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use.

Senate Bill 107 (2006)

SB 107 builds on SB 1078 and requires investor-owned utilities, energy service providers, and Community Choice Aggregations to procure an additional 1 percent of retail sales per year from eligible renewable sources until 20 percent is reached, no later than 2010. The California Public Utilities Commission and California Energy Commission are jointly responsible for implementing the program.

9 On September 19, 2019 the National Highway Traffic Safety Agency (NHTSA) and the US Environmental Protection Agency (EPA) issued a final action entitled the One National Program on Federal Preemption of State Fuel Economy Standards Rule. This action finalizes Part I of the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule. This rule states that federal law preempts State and local tailpipe greenhouse gas (GHG) emissions standards as well as zero emission vehicle (ZEV) mandates. The SAFE Rule withdraws the Clean Air Act waiver it granted to California in January 2013 as it relates to California's GHG and zero emission vehicle programs.

Executive Order S-1-07 (2007)

Also known as the Low Carbon Fuel Standard, EO S-1-07, issued in 2007, established a statewide goal that requires transportation fuel providers to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. EO S-1-07 was readopted and amended in 2015 to require a 20 percent reduction in carbon intensity by 2030, the most stringent requirement in the nation. The new requirement aligns with California's overall 2030 target of reducing climate changing emissions 40 percent below 1990 levels by 2030, which was set by SB 32 and signed by the governor in 2016.

Senate Bill 97 (2007)

Signed in August 2007, SB 97 acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Natural Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

Senate Bill 375 (2008)

SB 375, signed in August 2008, enhances the State's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. In addition, SB 375 directs each of the State's 18 major Metropolitan Planning Organizations (MPOs) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the MPO's Regional Transportation Plan (RTP).

Executive Order S-14-08 (2008)

EO S-14-08 was issued in 2008 and sets a statewide target of 33 percent renewable energy use by 2020.

California Green Building Code (2009)

The California Green Building Standards Code (CALGreen) is Part 11 of the California Building Standards Code or Title 24 and is the first statewide "green" building code in the nation. The purpose of CALGreen is to improve public health, safety, and general welfare by enhancing the design and construction of buildings. Enhancements include reduced negative impact designs, positive environmental impact designs, and encouragement of sustainable construction practices. The first CALGreen Code was adopted in 2009 and has been updated in 2013, 2016, and 2019. The CALGreen Code will have subsequent, and continually more stringent, updates every three years.

Senate Bill X7-7 (2009)

In 2009, SB X7-7, also known as the Water Conservation Act, was signed, requiring all water suppliers to increase water use efficiency. This legislation sets an overall goal of reducing per capita urban water use by 20 percent by 2020.

Senate Bill 2X (2011)

In 2011, SB 2X was signed, requiring California energy providers to buy (or generate) 33 percent of their electricity from renewable energy sources by 2020.

Assembly Bill 341 (2012)

AB 341 directed the California Department of Resources Recycling and Recovery (CalRecycle) to develop and adopt regulations for mandatory commercial recycling. As of July 2012, businesses were required to recycle, and jurisdictions had to implement a program that includes education, outreach, and monitoring. AB 341 also set a statewide goal of 75 percent waste diversion by the year 2020.

Senate Bill 743 (2013)

SB 743 introduces a new performance metric, vehicle miles traveled (VMT), as a basis for determining significant transportation impacts under CEQA. Projects that are projected to increase VMT may mitigate their impacts through measures such as car-sharing services, unbundled parking, improved transit, and enhanced pedestrian and bicycle infrastructure.

Assembly Bill 32 Scoping Plan Update (2014)

In 2014, CARB approved the first update to the Scoping Plan. This update defines CARB's climate change priorities and sets the groundwork to reach the post-2020 targets set forth in EO S-3-05. The update highlights California's progress toward meeting the near-term 2020 GHG emissions reduction target, defined in the original Scoping Plan. It also evaluates how to align California's longer-term GHG reduction strategies with other statewide policy priorities, such as water, waste, natural resources, clean energy, transportation, and land use.

Assembly Bill 1826 (2014)

AB 1826 was signed in 2014 to increase the recycling of organic material. GHG emissions produced by the decomposition of these materials in landfills were identified as a significant source of emissions contributing to climate change. Therefore, reducing organic waste and increasing composting and mulching are goals set out by the AB 32 Scoping Plan. AB 1826 specifically requires jurisdictions to establish organic waste recycling programs by 2016, and phases in mandatory commercial organic waste recycling over time.

Senate Bill 350 (2015)

SB 350, the Clean Energy and Pollution Reduction Act of 2015, has two objectives: to increase the procurement of electricity from renewable sources from 33 percent to 50 percent by 2030 and to double the energy efficiency of electricity and natural gas end users through energy efficiency and conservation.

Executive Order B-30-15 (2015)

In 2015, EO B-30-15 was signed, establishing an interim GHG emissions reduction target to reduce emissions to 40 percent below 1990 levels by 2030. The EO also calls for another update to the CARB Scoping Plan.

Senate Bill 32 (2016)

On September 8, 2016, the governor signed SB 32 into law, extending AB 32 by requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). The bill charges CARB to adopt the regulation so that the maximum technologically feasible emissions reductions are achieved in the most cost-effective way.

Senate Bill 1383 (2016)

Adopted in September 2016, SB 1383 requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. The bill requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires CalRecycle, in consultation with the CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills. The bill further requires 20 percent of edible food disposed of at the time to be recovered by 2025.

Scoping Plan Update (2017)

On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 goal set by SB 32. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted policies, such as SB 350 and SB 1383 .

The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2014 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of six metric tons (MT) CO_2e by 2030 and two MT CO_2e by 2050. As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the State (CARB 2017).

Senate Bill 100 (2018)

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's RSP Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

Executive Order B-55-18 (2018)

On September 10, 2018, the governor issued Executive Order B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

Assembly Bill 2127 (2018)

AB 2127 directs the California Energy Commission (CEC) to prepare and biennially update a statewide assessment of the electric vehicle charging infrastructure needed to support the levels of electric vehicle adoption for the state to meet its goal of putting at least five million zero-emission vehicles on California roads by 2030.

Innovative Clean Transit Rule (2018)

The Innovative Clean Transit Rule, adopted by CARB in 2018, requires public transit agencies to gradually transition to 100% zero-emissions bus fleets by 2040. This regulation applies to all transit agencies that own, operate, or lease buses with gross vehicle weight rating above 14,000 pounds.

Executive Order N-79-20 (2020)

On September 23, 2020, the governor issued EO N-79-20, which sets new statewide goals for phasing out gasoline-powered cars and trucks in California, which is applicable to state agencies. The EO requires 100% of in-state sales of new passenger cars and trucks to be zero-emission by 2035; 100% of in-state sales of medium- and heavy-duty trucks and busses to be zero-emission by 2045, where feasible; and 100% of off-road vehicles and equipment sales to be zero-emission by 2035, where feasible.

Advanced Clean Trucks Rule (2020)

The Advanced Clean Trucks Rule, adopted by CARB in June 2020, requires manufacturers of heavy-duty, on-road trucks to sell an increasing number of zero-emission trucks. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b to 3 truck sales, 75% of Class 4 to 8 vocational truck sales, and 40% of Class 7 to 8 truck tractor sales.

Senate Bill 27 (2021)

Adopted on September 23, 2021, SB 27 requires the state Natural Resources Agency to establish carbon sequestration goals for natural and working lands by July 2023. SB 27 also requires the Natural Resources Agency to create a registry of projects for public and private investment and track the carbon benefits of each project. The projects that would be part of this program may not generate compliance offsets under California's Cap-and-Trade program. Additionally, as part of the next Scoping Plan Update, CARB is required to establish specific CO_2 removal targets starting in 2030.

Senate Bill 379 (2022)

Adopted September 16, 2022, SB 379 requires cities and counties to implement an online, automated permitting platform to verify solar installation code compliance and issue permits in real time for residential solar energy systems no larger than 38.4 kilowatt hours.

Senate Bill 1020 (2022)

Adopted September 16, 2022, SB 1020 expedites the previous goals established by SB 100, by establishing a clean electricity goal for end-use customers of 90% by 2035, and 95% by 2040. Additionally, SB 1020 requires 100% of all electricity procured to serve all state agencies to be clean energy by December 31, 2035.

Senate Bill 1063 (2022)

Adopted September 16, 2022, SB 1063 creates appliance efficiency standards set by the State Energy Resources Conservation and Development Commission, which may now take effect sooner than one year after their adoption/revision. SB 1063 builds on Title 20 efficiency standards enforced through the California Energy Commission and first adopted in 1977.

Assembly Bill 1909 (2022)

Adopted September 16, 2022, AB 1909 removes prohibition of operating motorized electric bicycles or Class 3 bikes on bicycle paths or trails, bikeways, or bicycle lanes. However, the bill also includes an exemption for the Department of Parks and Recreation, which may prohibit these classes of bicycles on any bicycle path or trail within the department's jurisdiction, where appropriate.

Assembly Bill 1857 (2022)

Adopted September 16, 2022, AB 1857 amends various sections of the California Integrated Waste Management Act of 1989, which required jurisdictions to divert 50% of solid waste through source reduction, recycling, and composting activities, with no more than 10% through transformation. AB 1857 repeals the provision that jurisdictions may divert 10% through transformation (e.g., incineration). Additionally, AB 1857 requires the Department of Resources Recycling and Recovery to establish the Zero-Waste Equity Grant Program to support targeted strategies and investments in communities transitioning to zero-waste circular economies.

Assembly Bill 1985 (2022)

Adopted September 16, 2022, AB 1985 establishes penalties applied to jurisdictions for not meeting SB 1383 requirements. Penalty will be based on the percentage of the target the jurisdiction was able to achieve.

Assembly Bill 1279 (2022)

In September 2022, AB 1279 (e.g., the California Climate Crisis Act) was approved, which established a legally binding requirement for California to achieve and maintain carbon neutrality no later than 2045. Assembly Bill 1279 also established the requirement to achieve a Statewide reduction in GHG emissions of 85 percent below 1990 levels by 2045. This indicates that the remaining 15 percent to achieve carbon neutrality can be achieved via carbon sequestration and other non-direct-GHG-emissions-reductions techniques.

2022 Scoping Plan Update (2022)

In response to the passage of AB 1279 and the identification of the 2045 GHG reduction target, CARB adopted the Final 2022 Climate Change Scoping Plan in November 2022. The 2022 Update builds upon the framework established by the 2008 Climate Change Scoping Plan and previous updates while identifying new, technologically feasible, cost-effective, and equity-focused paths to achieve California's climate goals. The 2022 Update includes policies to achieve a significant reduction in fossil fuel combustion, further reductions in short-lived climate pollutants, support for sustainable development, increased action in natural working lands to reduce emissions and sequester carbon, and the capture and storage of carbon. The 2022 Update assesses the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan, addresses recent legislation and direction from Governor Newsom, extends and expands upon these earlier plans, and implements a goal of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045, as well as taking an additional step of adding carbon neutrality as a science-based guide for California's climate work.[10]

[10] CARB. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp.pdf

Advanced Clean Cars II (2022)

By 2035 all new passenger cars, trucks and SUVs sold in California will be zero emission vehicles. The Advanced Clean Cars II regulations take the state's already growing zero-emission vehicle market and robust motor vehicle emission control rules and augments them to meet more aggressive tailpipe emissions standards and ramp up to 100% zero-emission vehicles.

Enforcement of the Advanced Clean Cars II regulation remains uncertain at this time. On June 12, 2025, House Joint Resolution 88 was signed into law nullifying the Untied States Environmental Protection Agency's (U.S. EPA) notice which granted CARB's request for the regulation. The future of implementation remains unclear as California pursues legal action against the resolution.

Senate Bill 1020 (2022)

SB 1020, also known as the Clean Energy, Jobs, and Affordability Act of 2022, would build off of existing laws and require that eligible renewable energy resources and zero-carbon resources supply 90% of all retail sales of electricity to California end-use customers by December 31, 2035, 95% of all retail sales of electricity to California end-use customers by December 31, 2040, 100% of all retail sales of electricity to California end-use customers by December 31, 2045, and 100% of electricity procured to serve all state agencies by December 31, 2035, as specified.

Assembly Bill 209 (2022)

AB 209 requires the Department of Housing and Community Development (HCD) to develop policy recommendations that are designed to ensure that residential dwelling units can maintain a recommended maximum safe indoor air temperature. These recommendations consider state climate goals, the extreme heat plan, regional temperature differences, and various methods for reducing indoor air temperatures, including, but not limited to, technical feasibility, building and site electrical system limitations, cost barriers, electric utility capacity limitations, state and federal statutory requirements, and other relevant factors.

Advanced Clean Fleets Regulation (2023)

Adopted by CARB in 2023, the Advanced Clean Fleets (ACF) regulation requires fleets that are well suited for electrification to reduce emissions through requirements to phase-in the use of zero-emission vehicles (ZEVs) for targeted fleets.

In 2025, California withdrew the request for a federal waiver for the addition of the ACF regulation to the State's emissions control program. At this time, CARB is not enforcing the portions of the ACF regulation that require a federal waiver. However, not all elements of the ACF regulation require a federal waiver or authorization. The State and local government fleets portion of the ACF regulation remains unaffected. Additionally, CARB is encouraging affected industries and fleets to continue reducing their GHG emissions.

Assembly Bill 2684 (2024)

Adopted September 30, 2024, AB 2684 requires cities and counties to update the Safety Element chapter of the general Plan after January 1, 2028, to address extreme heat hazards.

Senate Bill 1221 (2024)

Adopted September 25, 2024, SB 1221, also known as Empowering neighborhood-scale decarbonization for a cleaner, safer future, will create long-term energy affordability for Californians, reduce emissions from the state's building stock, and create an equitable transition toward carbon neutrality by 2045. Signed by Governor Gavin Newsom, this legislation authorizes the California Public Utilities Commission to create up to 30 "neighborhood decarbonization zones." In these zones, communities can transition from gas to zero-emissions alternatives, such as electric heating and cooking appliances.

AB 130 New Exemptions Under CEQA (2025)

California Assembly Bill (AB) 130, signed into law on June 30, 2025, includes provisions that affect both the electrification of buildings and the California Environmental Quality Act (CEQA). While generally aimed at increasing housing and expediting development, the bill puts a temporary freeze on local residential electrification mandates and other green building standards.

The Fourth California Climate Change Assessment (Ongoing)

The Fourth California Climate Change Assessment, released in 2018, provides a statewide evaluation of how climate change is already affecting California's people, infrastructure, and natural systems. The Assessment finds that human-driven warming is contributing to more severe wildfires, intensifying drought, rising temperatures, sea-level rise, and increasing risks to public health and vulnerable communities. It outlines the state's growing exposure to climate hazards and identifies adaptation strategies to protect critical sectors such as water, energy, transportation, and agriculture. The Assessment underscores the need for coordinated planning and investments that strengthen community and ecosystem resilience.

California's Fifth Climate Change Assessment is currently underway and will deliver updated climate science, vulnerability analyses, and regional research to guide future state policies and local climate action.

Regional Regulations and Sustainability Plans

South Coast Air Quality Management District Rules and Regulations

The SCAQMD implements rules and regulations for emissions that may be generated by various uses and activities. The rules and regulations detail pollution-reduction measures that must be implemented during construction and operation of projects. Rules and regulations relevant to the Climate Action and Adaptation Plan (CAAP) include the following:

- **Rule 2202 (On-Road Motor Vehicle Mitigation Options):** This rule promotes strategies to reduce vehicle emissions, improving air quality and reducing urban heat island effects.
- **Rule 2702 (Greenhouse Gas Reduction Program):** This rule encourages emission reductions, supporting CAAP measures on climate resilience and carbon sequestration.

Air Quality Management Plan (2022)

SCAQMD's 2022 Air Quality Management Plan (AQMP) is the region's comprehensive strategy to meet federal air quality standards by reducing emissions from transportation, industry, and other sources. The plan focuses on reducing nitrogen oxides (NOx), volatile organic compounds (VOCs), and particulate matter (PM), which contribute to poor air quality and climate change.

Connect SoCal 2024 (2024)

Connect SoCal 2020 is SCAG's Sustainable Communities Strategy (SCS)/ RTP. Connect SoCal is a long-term plan for the Southern California region that details investment in our transportation system and development in our communities to meet the needs of the region both today and tomorrow. The horizon year for Connect SoCal is 2050. Connect SoCal identifies strategies for improving the transportation system such as reducing greenhouse gas emissions (GHG) through investment in clean transportation infrastructure, improving the multimodal transportation system, providing equitable access to transportation options, and connecting communities.

Regional Climate Adaptation Framework (2021)

SCAG developed the Regional Climate Adaptation Framework to provide Southern California cities with tools and strategies to build resilience against climate change impacts such as extreme heat, wildfires, and flooding. The framework offers data resources, best practices, and policy guidance to help local jurisdictions integrate adaptation into planning efforts.

Metro Climate Action and Adaptation Plan (2019)

Metro's Climate Action and Adaptation Plan sets a roadmap to reduce emissions from public transit operations and transportation projects. The plan establishes strategies for transitioning Metro's fleet to zero-emission vehicles, expanding sustainable mobility options, and integrating climate resilience into transportation infrastructure.

Los Angeles County Climate Vulnerability Assessment (2021)

The Los Angeles County Climate Vulnerability Assessment examines the region's susceptibility to various climate hazards, including extreme heat, wildfires, flooding, and drought. The assessment evaluates both social and physical vulnerabilities, highlighting how these climate impacts disproportionately affect different communities and sub-populations within the county. The report emphasizes the importance of equity in addressing these challenges, noting that certain areas and groups are more susceptible due to factors such as socioeconomic status, existing health disparities, and infrastructure quality. The findings aim to identify strategies to enhance the County's resilience against the increasing severity and frequency of climate-related events.

Los Angeles County Cooling Ordinance (2025)

Adopted in August 2025, the Los Angeles County Cooling Ordinance amends Chapter 11.20 of the County's Health and Safety Code to address extreme indoor heat in rental housing. The ordinance establishes a maximum indoor temperature of 82 °F for all habitable rooms in rental units located in unincorporated areas and in cities that choose to adopt the regulation.

It requires landlords to provide safe, code-compliant cooling methods to meet the temperature threshold, while allowing tenants to install portable or non-mechanical cooling devices at their own cost, provided installations meet safety standards. Small property landlords (≤ 10 units) must cool at least one habitable room by January 1, 2027, and all rooms by January 1, 2032, while larger properties must comply fully by 2027.

The ordinance includes tenant protections preventing eviction or rent pass-throughs for compliance costs and allows landlords to request extensions of up to two years for demonstrated hardship. By codifying indoor temperature standards, the ordinance aims to safeguard renter health and habitability during increasingly frequent extreme heat events.

Los Angeles County Sustainability Plan (2025)

The OurCounty Plan is Los Angeles County's long-term sustainability blueprint, updated in 2025. It sets bold goals for achieving carbon neutrality by 2045, improving air and water quality, scaling up renewable energy, and building climate resilience. The plan reflects a strong focus on equity-centered climate action, with 179 concrete actions across 12 goals — including electrification, sustainable land use, affordable and clean transportation, and community resilience. It also expands cross-departmental coordination to integrate environmental, social, and economic priorities across the County.

City of San Fernando Sustainability Plans and Policies

The City of San Fernando has implemented a suite of sustainability and climate-related plans aimed at reducing emissions, enhancing public health, and fostering community equity. These initiatives span from comprehensive planning frameworks to targeted transportation and urban greening efforts, as outlined below:

General Plan – Land Use, Circulation, Open Space & Conservation, Safety, and Housing Elements

San Fernando's General Plan encompasses key elements including Land Use, Circulation, Open Space and Conservation, Safety, and the Housing Element. These elements collectively guide sustainable development, hazard mitigation, mobility, environmental stewardship, and housing equity. The current Housing Element (2021–2029) is state-certified (August 2022), and the Safety Element integrates climate vulnerability and environmental justice considerations into preparedness strategies.

Urban Forestry Management Plan & Tree Preservation Policies

The City adopted an Urban Forest Management Plan (UFMP) in 2024, followed by a comprehensive Tree Preservation Policy in March 2025, to conserve, expand, and responsibly manage public trees. Private landscaping requirements now emphasize native, drought-resistant species, preservation of legacy

trees, and a minimum of 50% live landscaping in front yards—aligning with equity and environmental goals.

Corridors Specific Plan (SP-5)

Updated in 2017 with Metro collaboration, the Corridors Specific Plan (SP-5) promotes transit-oriented development (TOD), mixed-use centers, walkable streets, and integrated multimodal design around San Fernando's downtown and Metrolink Station. This approach garnered a SCAG Sustainability Award for its innovation in sustainable urban planning.

Parks & Recreation Master Plan & Regional Park Infiltration Project

The Parks & Recreation Master Plan supports park revitalization and community-driven redesign of parks like Las Palmas, Layne, and Pioneer. The San Fernando Park Opportunity Plan (SF POP) further activates underused spaces with community input. Complementing these efforts, the Regional Park Infiltration Project captures stormwater from nearly 940 acres—serving flood mitigation, groundwater recharge, and public education goals.

Safe and Active Streets Implementation Plan (SASIP)

Building on the 2016–17 Safe and Active Streets Plan, the Implementation Plan (SASIP) was funded through a Caltrans Sustainable Communities Planning Grant and finalized in early 2022. The Plan identifies and phases priority projects—such as curb extensions, sidewalks, bike facilities, and ADA upgrades—developed through extensive community engagement (audits, charrettes, multilingual outreach). It also lays out design concepts, cost estimates, and strategies for securing state and local funding. This ongoing framework helps San Fernando coordinate street-safe improvements and active transportation infrastructure.

Strategic Climate Resilience Goals (2022–2026)

San Fernando's Strategic Goals for FY 2022–2026 emphasize climate resilience and environmental justice across policy and implementation. Notable projects include:

- Solar and battery systems at municipal venues
- Regional Park infiltration system deployment
- Expansion of the Pacoima Wash bike path and implementation of the Safe & Active Streets Plan
- Urban greening via Calles Verdes—planting 490+ trees and installing stormwater features in alleys and lots
- Planning for resiliency hubs and leveraging vulnerability assessments to guide equitable emergency preparedness

Appendix B

Community Engagement Summary

Community Outreach and Engagement

This appendix provides a detailed summary of the community engagement activities completed during the development of the San Fernando Climate Action & Resilience Plan (CARP). Between Fall 2024 and Winter 2026, the City and project partners hosted eight community events, four Advisory Group meetings, and five public hearings. Engagement activities were intentionally designed to reach diverse audiences, meet residents where they already gather, and confirm that community voices shaped the CARP's priorities, equity guardrails, and measures.

1. Community Meetings & Workshops

The purpose of community meetings and workshops was to introduce the CARP, share data on existing conditions, and build community capacity to participate in the planning process. Details can be found in Table 1, with photos of the meetings and workshops presented below.

Table 1 Community Meetings & Workshops

Event	Date	Audience	Description
Planning 101 Workshop	Sept. 28, 2024	Community members	The first official community event. Participants learned about general planning concepts, climate adaptation, and how residents can influence long-range planning. The workshop focused on empowering residents—especially low-income and BIPOC participants—to advocate for equitable investment in their neighborhoods.
Community Workshop #1 & Tribal Workshop #1	Nov. 2024	Community members & Tribal members (FTBMI)	Introduced the CARP process, presented early findings on climate vulnerabilities, and facilitated round-table discussions about residents' priorities. The Tribal workshop provided space for sovereign Tribal governance and cultural considerations to be incorporated into the CARP.
Community Workshop #2	April 3, 2025	Community members	Presented draft climate strategies, measures, and actions. Participants used interactive boards to provide structured feedback on priorities and potential challenges.
Tribal Workshop #2	December 2025	FTBMI Tribal members	Provided a final review opportunity for Tribal members to confirm representation of Tribal priorities before adoption.


Biodiversidad
Biodiversidad
Pavimento
fresco


Park Availability and Accessibility Map

2. Walkshops (Citizen Science Field Events)

Walkshops enabled residents to co-produce data and directly inform geographical and equity focus areas in the CARP. Details can be found in Table 2 below.

Table 2 Walkshops

Event	Date	Audience	Description
Walkshop #1	Feb 22, 2025	Community Members	Participants walked priority corridors to observe on-the-ground conditions such as heat exposure, flooding areas, and mobility barriers. Residents used handheld tools—including infrared thermometers and heat sensors—to compare real-time temperature differences, calibrating scientific data with lived experience. The walkshop helped identify potential pilot project locations for shading, cooling, and mobility improvements.


Planting Grassroots
Since 1996

3. Community Pop-Up Events (Tabling at Existing City Events)

Across pop-up events, the project team distributed educational materials, shared resources on energy rebates, and encouraged continued involvement in implementation efforts. Details can be found in **Error! Reference source not found.** below.

Table 3 Community Pop-Up Events

Event	Date	Audience	Description
San Fernando Mile	March 1, 2025	Community Members	Pop-up booth provided low-barrier engagement with hundreds of residents. Community members voted on climate priorities using interactive boards and shared concerns about safety, heat, and transit access.
Spring Jamboree	April 19, 2025	Community Members	Provided project updates and collected feedback on climate strategies. Residents completed voting exercises and received bilingual resources on rebates, energy conservation, and participation in sustainability programs.
Movie in the Park	July 25, 2025	Community Members	Family-focused outreach that generated feedback from hard-to-reach demographics, including youth and renters. Residents received information about resilience hubs and emergency preparedness and signed up for project updates.


Community Development Department


Pacoima
Beautiful

4. Community Survey

To supplement in-person engagement, the City launched a bilingual (English and Spanish) online survey that remained open throughout the CARP process. The survey provided a low-barrier option for residents to contribute feedback at their convenience. Physical voting boards displaying QR codes were also placed at workshops and pop-up events to increase accessibility for residents who preferred to provide feedback in person.

Participation

- 175+ total responses, representing a broad cross-section of San Fernando residents.
- 56% of respondents had never participated in a City planning process before, demonstrating that the CARP engagement strategy successfully reached new voices.

Climate Perceptions & Concerns

- Over 80% of respondents are very or somewhat concerned about climate change.
- The top climate concerns identified were:
    - Extreme heat
    - Poor air quality (including wildfire smoke)
- Residents expressed strong interest in cooling centers, shaded public spaces, and programs that assist households in adapting to high temperatures.

Adaptation & Resilience Priorities

Residents ranked climate adaptation priorities. The highest-priority actions were:

- Preparing for extreme heat and improving heat-response planning
- Expanding shaded and climate-resilient public spaces
- Improving access to emergency preparedness resources

These preferences directly shaped the CARP's Cornerstone Measure, which focuses on building year-round resilience hubs and expanding community access to cooling, clean air, and resilience resources.

Mobility & Transportation

- 74% of survey participants rely on gas- or diesel-powered vehicles as their primary mode of travel.
- When asked what would encourage more biking, walking, or active commuting, respondents prioritized:
  - Safer, dedicated active transportation facilities (bike lanes, wider sidewalks)
  - Shaded routes to reduce heat exposure
  - Secure bike parking
  - Programs such as bike/scooter share

Barriers to Climate Action

Respondents identified key hurdles that could prevent households from participating in sustainability upgrades:

- 48% are renters and unable to make household upgrades, highlighting the need for landlord-focused and multi-family engagement programs.
- Other commonly identified barriers:
  - High upfront costs
  - Lack of knowledge about incentives and rebates
  - Limited time or awareness about available resources

Language & Accessibility

- Feedback confirmed that materials and communications must be multilingual and distributed through trusted community organizations.
- Respondents preferred information through:
  - Social media
  - School and neighborhood events
  - Hands-on workshops

5. Community Advisory Group (CAG)

The CAG confirmed that equity was not an "add-on," but a guiding principle embedded throughout the CARP.

- Comprised of eight residents selected from more than 20 applicants.
- Represented diversity in age, language, and lived experience.
- Met four times (Jan–Nov 2025).

- Reviewed and refined:
  - Equity guardrails
  - Climate priorities

Summary

Through workshops, walkshops, pop-up events, surveys, and an engaged Advisory Group, more than 1,000 touchpoints with community members shaped the CARP. Engagement activities resulted in:

- Refinement of equity guardrails
- Confirmation of priority strategies (especially extreme heat preparedness)
- Identification of barriers to climate action
- Community-driven resilience solutions

This breadth of input confirmed that the CARP reflects real community priorities, centers equity, and builds long-term support for implementation.

Appendix C

Climate Change Vulnerability Assessment

City of San Fernando

Climate Change Vulnerability Assessment

January 2024

Prepared by

Rincon Consultants, Inc.

Table of Contents

Tables

Figures

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1 Introduction

1.1 Land Acknowledgement

The City of San Fernando acknowledges that is it located on the ethnohistoric territory of the ancestral land of the Tongva people and the present community of Fernandeño Tataviam Band of Mission Indians (FTBMI). This land was and continues to be of great importance to the FTBMI and other tribal members. As members of the San Fernando community, it is vitally important that we not only recognize the history of the land on which we live, work, and learn, but also, we recognize that the FTBMI people are alive and flourishing members of the San Fernando and broader Los Angeles metropolitan area communities today.

1.2 Purpose

Climate change is a global phenomenon that can impact local health, the stability of natural resources, the integrity of parks, the resilience of infrastructure, and the effectiveness of emergency response. The intricate web of interconnected impacts underscores the imperative for comprehensive and adaptive strategies to mitigate and adapt to the multifaceted challenges posed by this overarching environmental shift. This report evaluates how climate change may impact vulnerable community members; natural and recreational resources; buildings and facilities; and services and infrastructure in San Fernando. The guiding methodology used in this assessment is based on the California Adaptation Planning Guide, which is discussed in the *Vulnerability Assessment Methodology* section.

Understanding the City's vulnerabilities to climate change provides a foundation for developing climate adaptation measures and actions for the City's Climate Action and Resilience Plan (CARP). The CARP will also include measures and actions that will help to reduce greenhouse gas (GHG) emissions. The difference between climate mitigation and adaptation measures and actions are illustrated in Figure 1.

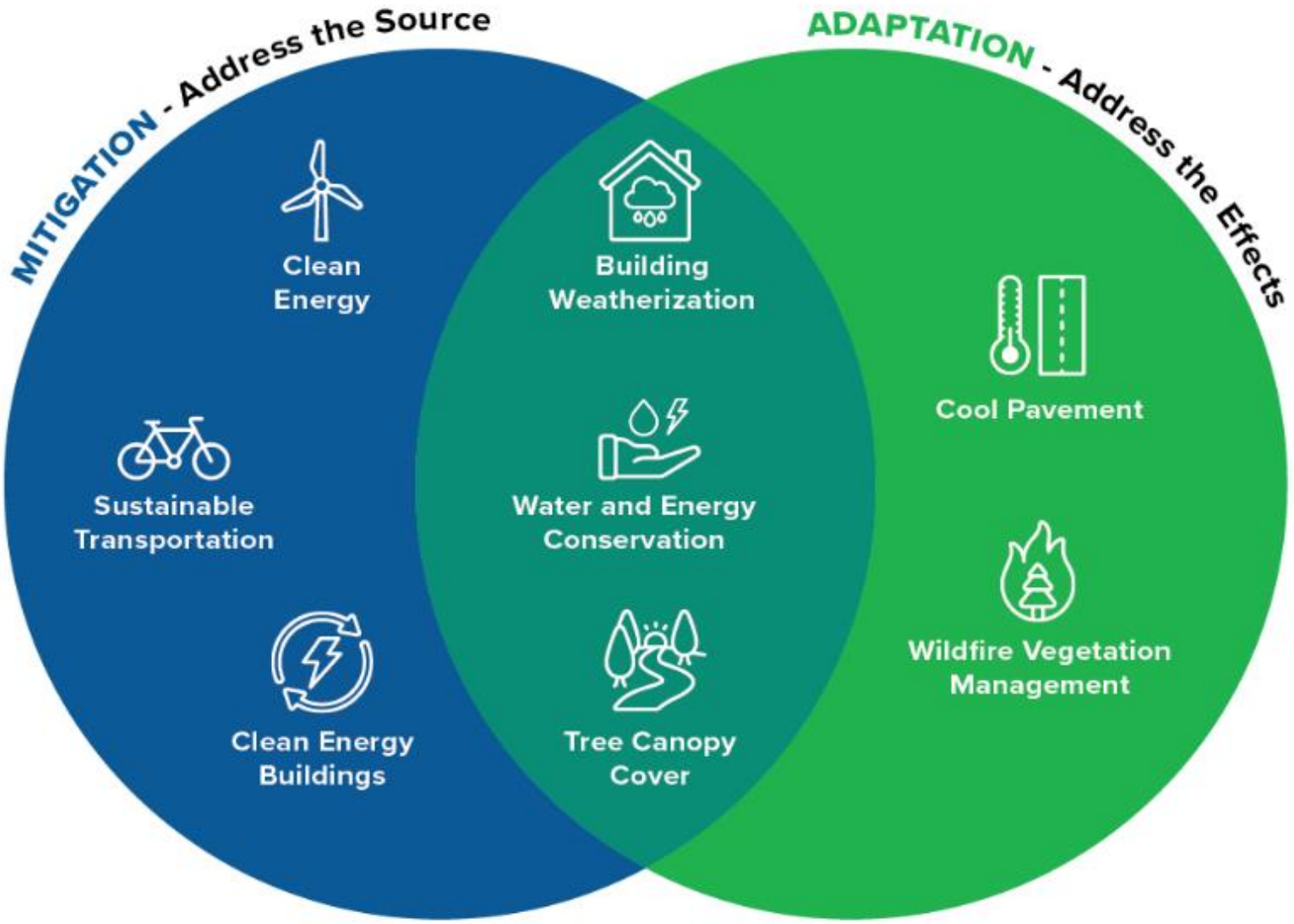
Causes of Climate Change

Climate change is caused by the addition of excess greenhouse gases (GHGs) to the atmosphere, which traps heat near the earth's surface raising global average temperatures in what is referred to as the greenhouse effect. This increase in average temperatures across the globe affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry (NASA 2022). According to the Intergovernmental Panel on Climate Change (IPCC), GHGs are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 410 parts per million in the last 150 years (IPCC 2021). The dramatic increase in GHGs is attributed to human activities beginning with the industrial revolution in the 1800s, which represented a shift from an agrarian and handicraft-based economy to one dominated by industry and machine manufacturing (NASA 2022).

1.3 San Fernando Snapshot

San Fernando is located in northeast Los Angeles County, about 20 miles northeast of downtown Los Angeles. The City is surrounded on all sides by the City of Los Angeles, including the Los Angeles neighborhoods of Pacoima, Sylmar, Lake Vire Terrace, and Missions Hills. The City has a population of 23,946 residents and spans 2.37 square miles. Interstate 5 (I-5) borders the City on the west, Interstate 210 (I-210) borders the City on the east, and California State Route 118 (CA 118) borders the City to the south.

Figure 1 Climate Change Mitigation and Adaptation



1.4 Glossary

Several words and phrases are used throughout this assessment to illustrate climate vulnerabilities within San Fernando.

- **Adaptation.** The process of adjustment to actual or expected climate and its effects, either to minimize harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate (IPCC 2012).
- **Adaptive Capacity.** The City of San Fernando's ability to cope with and adjust to the impacts of climate change (Cal OES 2020).
- **Asset.** Refers to a resource, structure, facility, or service that is relied on by a community.
- **Cascading Impact.** Climate hazard caused impacts that compromise infrastructure or disrupt critical services (e.g., power supply or water conveyance) broadening the scope of impact past a singular subject to reliant subsystems and populations (Collins et al. 2019).
- **Climate Hazard.** A dangerous or potentially dangerous condition created by the effects of the local climate (Cal OES 2020). Climate hazards of concern for San Fernando are extreme heat and warm nights, drought, stormwater flooding, and poor air quality.
- **Climate Indicator.** A measure of a particular aspect of the Earth's climate that can be tracked over time to show trends and changes. Climate indicators relevant to the City of San Fernando and discussed in this report are temperature and precipitation.
- **Compounding Risk.** When two or more extreme events or average events occur simultaneously and increase the scope of impact or severity of the event; an additional risk brought about by increased frequency of events from climate change (Seneviratne et al. 2012).
- **Impact.** Effects on natural and human systems including those on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate hazards and the vulnerabilities of the system or asset effected (IPCC 2012).
- **Mitigation.** An act or sustained action(s) to reduce, eliminate, or avoid negative impacts or effects (Cal OES 2020).
- **Resilience.** The capacity of an entity (an individual, a community, an organization, or a natural system) to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience (Cal OES 2020).
- **Sensitivities.** The degree to which a species, natural system, community, asset, or other associated system would be affected by changing climate conditions (Cal OES 2020).
- **Vulnerable Populations.** Certain populations experience increased exposure, risk, or vulnerability to climate change impacts and often have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts (Cal OES 2020). Assessing and mitigating impacts to these populations is prioritized given the increased risks and sensitivities.
- **Vulnerability.** The propensity or predisposition to be adversely affected (IPCC 2012).

1.5 Engagement

Incorporating input from experts in the field and interested parties into the development of this Climate Change Vulnerability Assessment provides critical context for how recent climate-driven events in San Fernando have impacted critical infrastructure, services, and community members. It also serves to identify existing government-run programs within the City and remaining gaps that can be filled through strategies included in the CARP.

A survey was developed and distributed to City departments, community-based organizations, utilities, and local agencies in October 2023. The survey elicited critical information on the scale of impacts, vulnerabilities, and existing adaptive capacity of the City. This information is incorporated throughout the Vulnerability Analysis section. The following entities were contacted to provide input on the survey:

- San Fernando Building and Safety Division
- San Fernando Water Division
- Southern California Edison
- Southern California Gas Company
- San Fernando Economic Development Team
- San Fernando Planning Division
- San Fernando Recreation and Community Services
- San Fernando Policy Department
- San Fernando Public Works Department
- City of Los Angeles Fire Department
- Mission City Transit
- LA County Metropolitan Transportation Authority
- San Fernando Valley Rescue Missions
- Los Angeles Homeless Services Authority (LAHSA)
- Pacoima Beautiful
- West Coast Arborists
- Tree People
- Downtown San Fernando Mall Association Group
- Fernandeño Tataviam Band of Mission Indians
- San Fernando Housing Element Tech Advisory
- San Fernando City Chamber of Commerce
- San Fernando Community Health Center
- Neighborhood Legal Services Los Angeles
- North Valley Caring Services

Future engagement efforts will further inform climate adaptation policies and programs in the City's CARP and will continue to provide ongoing guidance on strategies that address key community needs.

1.6 Vulnerability Assessment Methodology

California Adaptation Planning Guide Phases

The following section details state guidance, methods, and sources used in the preparation of this report.

The San Fernando Climate Change Vulnerability Assessment follows the vulnerability assessment process recommended by the California Governor's Office of Emergency Services (Cal OES), as documented in the 2020 California Adaptation Planning Guide (Cal APG). The adaptation planning process outlined by the Cal APG consists of four phases, summarized in detail below and illustrated in Figure 1.

1. Phase 1 consists of scoping a project to define, explore, and initiate the planning process, which the City completed as part of the CARP initiation.
2. Phase 2 consists of the vulnerability assessment process which encompasses this report and is outlined in more detail in Figure 3.
3. Phase 3 consists of developing adaptation strategies to address climate vulnerabilities which will be completed as part of the CARP.
4. Phase 4 consists of the implementation, monitoring, evaluation, and adjustment of the adaptation strategies which will be an effort implemented by the City after the CARP is adopted.

Figure 2 California Adaptation Planning Guide Phases

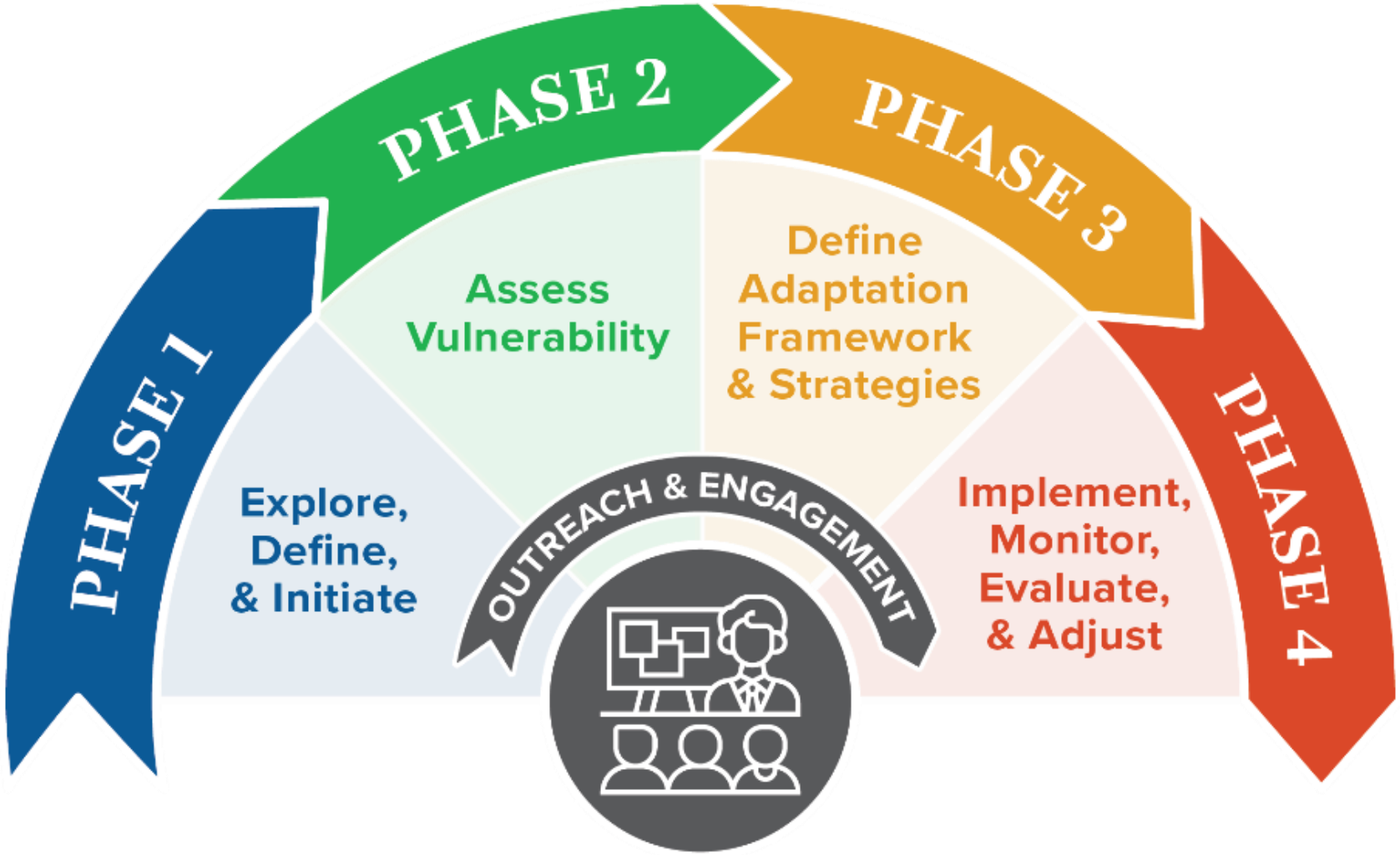
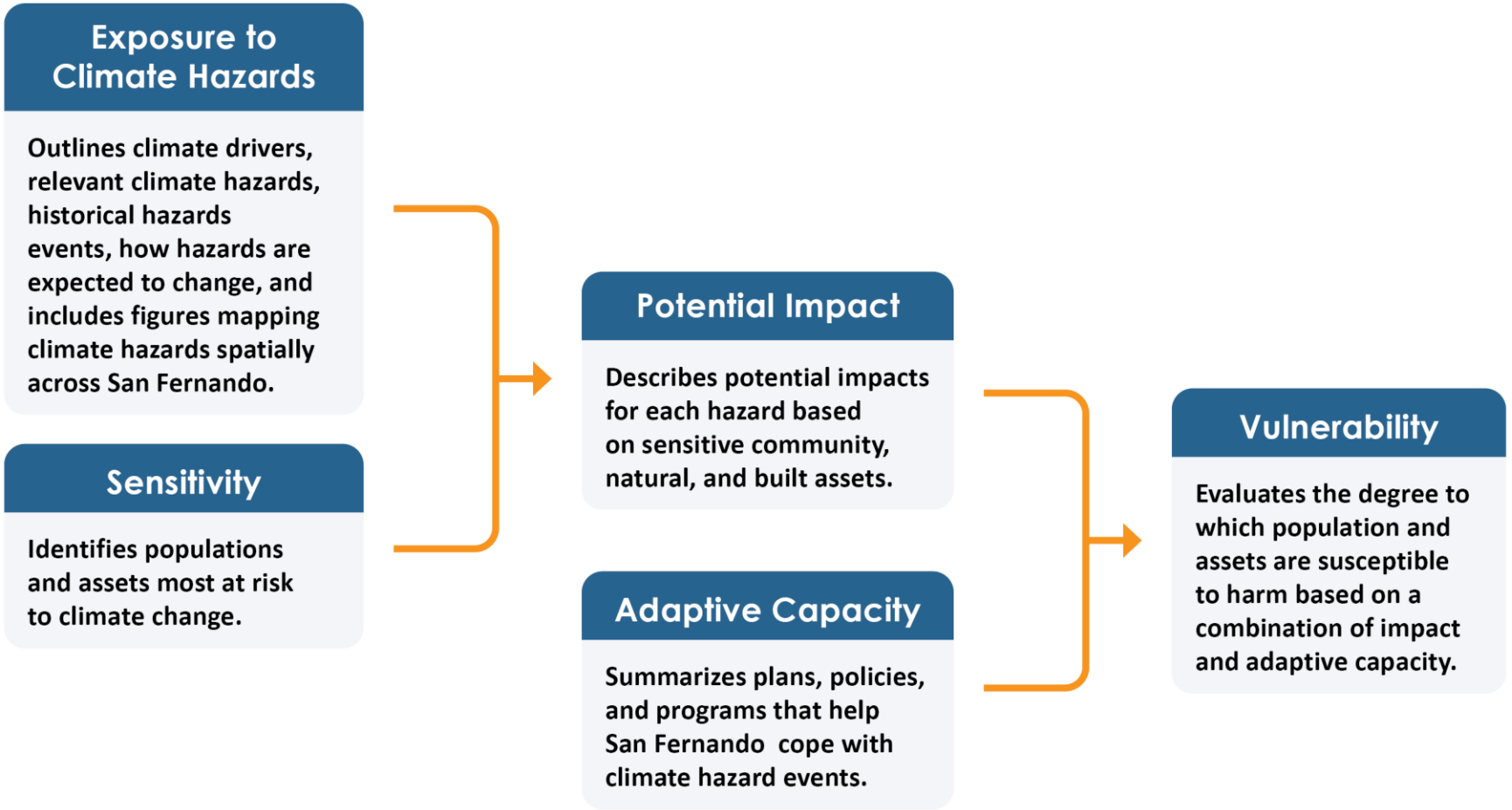


Figure 3 Vulnerability Assessment Flow Diagram



Vulnerability Scoring Methodology

Vulnerability scoring is a valuable step in the climate vulnerability assessment process because it identifies which assets and populations face the greatest threat from climate hazards. This can aid in the prioritization of adaptation actions. The vulnerability score is a combination of the impact and adaptive capacity scores. The impact and adaptive capacity scores are developed using a qualitative methodology outlined in the Cal APG, as shown in Table 1. Impact and adaptive capacity scores are assigned for each climate hazard for all assets and sensitive populations. The vulnerability score is prepared by combining the two scores as demonstrated in Table 2. The range of potential impacts spans 1 through 5 with 4-5 representing the highest levels of potential impact.

Table 1 Impact and Adaptive Capacity Scoring Rubric

Score	Impact	Adaptive Capacity
Low	Impact is unlikely based on projected exposure; would result in minor consequences to public health, safety, and/or other metrics of concern.	The population or asset lacks capacity to manage changes; major changes would be required.
Medium	Impact is somewhat likely based on projected exposure; would result in some consequences to public health, safety, and/or other metrics of concern.	The population or asset has some capacity to manage climate impact; some changes would be required.
High	Impact is highly likely based on projected exposure; consequences to public health, safety, and/or other metrics of concern.	The population or asset has high capacity to manage climate impact; minimal to no changes are required.

Source: Cal OES 2020

Table 2 Vulnerability Score Matrix

		Adaptive Capacity		
		High	Medium	Low
Potential Impacts	High	3	4	5
	Medium	2	3	4
	Low	1	2	3

Source: Cal OES 2020

Social Vulnerability Methodology

The presence of vulnerable populations in the City of San Fernando were identified based on the U.S. Census 2022 American Community Survey (ACS) data and the Public Health Alliance of Southern California, Healthy Places Index (HPI). This report is consistent with the Southern California Association of Governments (SCAG) Southern California (SoCal) APG and Cal APG methodologies for identifying, grouping, and analyzing vulnerable populations.

The SoCal APG identifies the following populations as generally experiencing higher risk for climate impacts in a given community (SCAG 2020):

- Low income
- Experiencing homelessness
- Incarcerated
- Unemployed or underemployed
- Seniors and young children
- Military veterans
- Non-white communities
- Renters
- Students
- Visitors and seasonal residents
- Outdoor workers
- Single female heads of households
- Undocumented immigrants
- Non-English speakers
- Tribal and indigenous communities
- Individuals with impaired health/disabilities
- Isolated individuals (e.g., no car or transit access)
- Individuals with educational attainment less than 4 years of college
- Individuals who live in areas of high violent crime

San Fernando's vulnerable populations are described in the Vulnerability Analysis section later in this report.

Key Data Sources

The following data sources and tools, many of which are recommended within the Cal APG and SoCal APG, were used in preparation of this report.

- **U.S. Census, 2022 American Community Survey (ACS)** presents demographic data by census tract and was used in the social vulnerability analysis. U.S. Census data was used to identify the percentage of the San Fernando population that corresponds to each vulnerable group.
- **The California Healthy Places Index (HPI)** is an online mapping tool that reports on community conditions that are known to predict health outcomes and life expectancy. The tool was prepared by the Public Health Alliance of Southern California, a collaborative of local health departments in Southern California. HPI displays 25 community characteristics at various legislative boundaries, including census tracts and city and county boundaries. The community characteristics relate to the following identified Policy Action Areas: economic, education, housing, health care access, neighborhood, clean environment, transportation, and social factors. HPI applies a relative percentile score across all census tracts in California using statistical modeling techniques based on the relationship of the Policy Action Areas to life expectancy at birth. Low percentile scores reflect unhealthy conditions. HPI was used to identify vulnerable populations as described above. HPI is useful in providing both big picture and localized insights into community health. The tool was supplemented with additional information from alternative data sources as noted, for indicators that are not included in HPI.
- **Cal-Adapt** is an online tool that presents historic and modeled projections based on 10 different global climate models. The tool was developed and is maintained by the University of

California, Berkeley with oversight from the California Energy Commission (CEC). This tool is used to present projection data related to minimum and maximum temperature, precipitation, extreme heat, warm nights, and drought. This tool uses data from California's Fourth Climate Change Assessment and is expected to be updated soon with data from the Fifth Climate Assessment as it becomes available.

- **California's Fourth Climate Change Assessment** was developed by the CEC and other State of California coordinating agencies to present up-to-date climate science, projections, and potential impacts associated with climate change. The CEC and coordinating agencies developed nine reports to provide regional-scale climate information to support local planning and action. The Los Angeles Region Summary Report (2018) presents an overview of climate science, regional projections, specific strategies to adapt to climate impacts, and key research gaps needed to spur additional progress on safeguarding the Los Angeles Region from climate change. The Los Angeles Region Summary Report was used to understand regional changes that may affect San Fernando both directly and indirectly.
- **California Heat Assessment Tool (CHAT)** is an online mapping tool funded by the California Natural Resources Agency as part of California's Fourth Climate Change Assessment to help state and local public health officials understand how heat vulnerability will change with increasing temperatures due to climate change. CHAT uses historical and projected daily maximum and minimum temperature, humidity, and emergency room visit data along with population and environmental characteristics to assign census tracts with heat vulnerability scores and to project the frequency and length of Heat Health Events over the course of the century for two climate scenarios (RCP 8.5 and RCP 4.5). A Heat Health Event (HHE) is any heat event that generates public health impacts, regardless of the absolute temperature.
- **Tree Equity Score** is a mapping tool created by the non-profit organization, American Forests, using tree canopy data from Earth Define. Trees provide numerous environmental and health benefits, including improved air quality, shade, and ambient cooling. Trees are often distributed unequally throughout the neighborhoods in cities. Tree Equity Score is intended to help identify census tracts that could benefit from additional tree planting the most and to estimate the benefits of tree planting to make the case for allocating the resources needed to do so. Tree Equity Scores are based on how much tree canopy and surface temperature align with income, employment, race, age, and health factors. Scores are meant to indicate whether there are enough trees in specific neighborhoods or municipalities for everyone to experience the health, economic, and climate benefits that trees provide.
- **Los Angeles County Climate Change Vulnerability Assessment** is a comprehensive assessment of the social and physical vulnerabilities facing Los Angeles County as a result of climate change. The assessment defines high climate vulnerability as a combination of increased exposure to climate hazards; high susceptibility to negative impacts of exposure; and low adaptive capacity, or ability to manage and recover from exposure. The assessment includes a Climate Hazard Assessment which evaluates potential changes in the frequency and severity of specific climate hazards (extreme heat, wildfire, extreme precipitation and inland flooding, coastal flooding, and drought) resulting from climate change in the coming decades. It also includes a Social Vulnerability Assessment which looks at the level of risk across communities and populations and identifies groups and places that are highly vulnerable to climate hazards. The third major section is the Physical Vulnerability Assessment

which examines how physical infrastructure and facilities across the County face risk of damage from climate hazards and outlines how damage to highly vulnerable facilities could affect people and society. Finally, the Cascading Impacts Assessment explains how infrastructural systems rely on one another and how harm to one type of infrastructure can affect other facilities, related services, and the people who rely on those services.

- **City of San Fernando Multi-Hazard Mitigation Plan** contains a series of proposed action items that, when implemented, can help reduce the risk from hazards through education and outreach programs, the development of partnerships, and the implementation of preventative activities (e.g., land use programs) that restrict and control development in areas subject to damage from natural hazards. The Plan includes earthquake, flood, windstorm, and epidemic/pandemic/vector-borne diseases mitigation action items.

Data Limitations

The limitations of this report and analysis stem from gaps in data availability and completeness of data methods. Census data can miss portions of the population (e.g., individuals experiencing houselessness, undocumented immigrants) and general demographic information may not fully identify the full extent of populations at increased risk from climate change impacts. Extrapolating air quality hazard exposure data in the context of climate change is difficult because it is at a regional scale and regional GHG impacts have not traditionally been measured or monitored in the same way that local air quality has been. Therefore, the estimates of exposure to these hazards are likely to be underestimated.

The data presented in **Cal-Adapt** tools are projections, or estimates, of future climate. The limitation in these projections is that the long-term behavior of the atmosphere is expressed in averages – for example, average annual temperature, average monthly rainfall, or average water equivalent of mountain snowpack at a given time of year. The averages discussed often downplay the extremes by which daily weather events occur and when presented as an average, only show moderate changes within the climate. What is often lost in averages is that the frequency of extremes, like atmospheric rivers[1], may increase while low-moderate intensity weather events decrease through the end of the century. In instances of modeled precipitation projections, it maintains an average similar to historic levels which does not account for anticipated fluctuations in extremes (CEC 2023).

[1] Atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics (NOAA. 2023 What are atmospheric rivers? https://www.noaa.gov/stories/what-are-atmospheric-rivers)

2 Exposure to Climate Hazards

. Projected changes to the climate are dependent on location. The Cal-Adapt tool provides climate data from global scale models that have been localized (downscaled) to large 3.7 mile by 3.7-mile grids (CEC 2021). Note that this grid size fully encompasses the City of San Fernando. The data in Cal-Adapt specific to San Fernando is combined with information from the California Fourth Climate Change Assessment Los Angeles regional report and the Los Angeles County Climate Change Vulnerability Assessment to describe projected future changes for specific types of hazards. Projections throughout this section are presented consistent with the Governor's Office of Planning and Research (OPR) using Representative Concentration Pathway (RCP) 8.5 as a conservative approach to assessing and adapting to climate change (CEC 2021). RCP 8.5 is a high greenhouse gas emissions scenario in which global emissions continue to rise through the end of the 21st century.

Additionally, projections are forecasted to mid-century (2035-2064) and end-of-century (2070-2099) as 30-year averages and are compared to a modeled historical baseline (1961-1990) (CEC 2021).

This section presents information on temperature and precipitation, which are characterized as climate indicators. The Hazards section provides information on projected changes to extreme heat, drought, stormwater flooding, and air quality resulting from changes to the climate indicators.

2.1 Climate Indicators

The climate indicators most relevant to San Fernando are temperature and precipitation. The following section summarizes projected changes to these climate indicators. All projections are pulled from the Cal-Adapt Local Climate Change Snapshot tool (CEC 2021, CEC 2018).

Temperature

Observations over the past century indicate that temperature has increased across the Southern California region. Based on historical temperature records (1896-2015) from the California South Coast NOAA Climate Division, which encompasses the Los Angeles region, significant trends were identified in annual average, maximum, and minimum temperatures.

Warming is expected to increase across the Los Angeles region in the coming decades. Under RCP 8.5, future model-average temperature values are projected to increase by 2.3 degrees Fahrenheit (°F) by the early-21st century, 4.2°F by the mid-21st century, and 5.2°F by the late-21st century compared to the modeled historical annual average maximum temperature of 72.5°F. Furthermore, the intensity and frequency of extreme heat days are also projected to increase over the Los Angeles region. Under RCP 8.5, the average hottest day of the year is expected to increase by 4-7°F.

Average maximum and minimum temperatures are expected to increase in the City. Compared to the 1961-1990 baseline, average maximum temperatures in San Fernando are expected to rise between 5.3°F (RCP 4.5) and 8.7°F (RCP 8.5) by the end of the century. Average minimum temperatures in San Fernando are expected to rise similarly, between 4.8°F (RCP 4.5) and 8.2°F (RCP 8.5) by the end of the century. Temperature increases affect

various climate related hazards including extreme heat and warm nights, drought, and air quality, further described in the Hazards section.

Precipitation

Precipitation over the Los Angeles region is highly variable from year to year. Typically, about five storms each year generate approximately 50 percent of total precipitation. Model projections are inconsistent, but in general, small changes are expected relative to the region's historic variability in average annual precipitation. However, dry and wet extremes are both expected to increase in the future thus increasing the potential for higher variability in precipitation. By the late-21st century, the wettest day of the year is expected to increase across most of the Los Angeles region, with some locations experiencing 25-30 percent increases under RCP 8.5.

In San Fernando, the modeled historical (1961-1990) annual precipitation is a 30-year average of approximately 17.2 inches. Mid-century projections predict annual precipitation to decrease about 0.6 inches (both RCP4.5 and RCP8.5). By the end of the century, annual precipitation is expected to decrease between 0.3 (RCP4.5) to 0.6 inches (RCP8.5) below the current 30-year average of 17.2 inches. While average annual precipitation is not expected to change significantly, precipitation will likely fall in more intense storms within a shorter wet season. For much of the state, research suggests that wet years will become wetter and dry years will become drier and will extend for longer stretches of time, increasing the risk of extended drought. Notably, Hurricane Hilary, a category four storm, swept across southern California and the Los Angeles region in August 2023. Downtown Los Angeles recorded its wettest single summer day on record (2.48 inches).

2.2 Hazards

This section outlines projected changes for the following climate hazards:


Extreme Heat


Drought


Stormwater Flooding

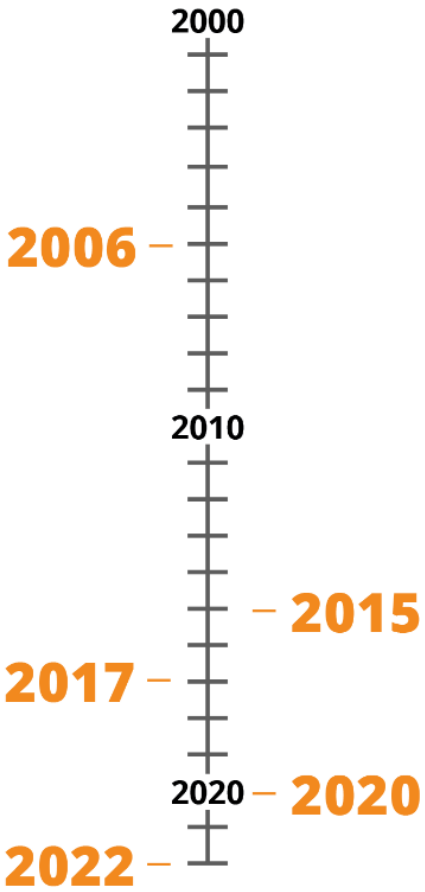

Air Quality

EXTREME HEAT

Past

Extreme heat events across the state have presented historic challenges for all communities, including San Fernando, which has experienced five extreme heat events over the past two decades.

Extreme Heat Events

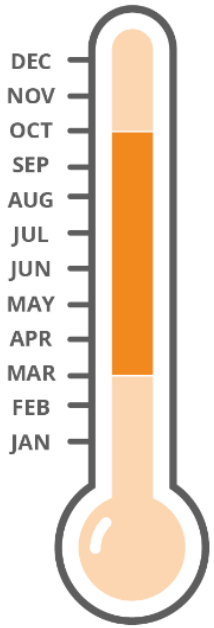


Present

Extreme heat events are presently defined as days in which the temperature exceeds the 98th percentile (101.7F). Current extreme heat days occur between the months of April to October, while the 30-year baseline average is 4 days annually.

Extreme Heat Months

(Baseline Years)

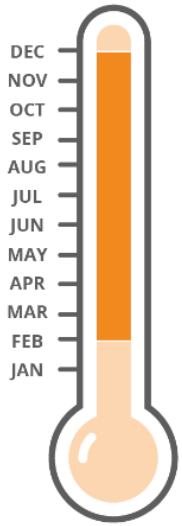


Future

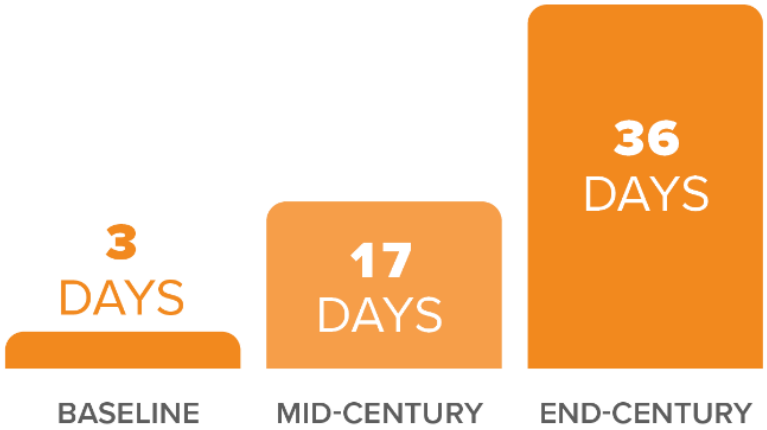
Extreme heat is expected to affect all of San Fernando, with greatest impacts to vulnerable population groups. Days over 101.7°F are projected to increase by 36 days by the end of the century and occur during a wider range of months from February to December. The largest increases in the Los Angeles region for extreme heat events are projected for the San Fernando Valley.

Extreme Heat Months

(End-century Years)



Projected Annual Average of Extreme Heat Days



Urban Heat Island

Urban Heat Island (UHI) is a term that refers to developed areas that are hotter than the surrounding landscape primarily due to the presence of building materials and surfaces that absorb and re-radiate heat (like roofs and pavements), as well as a lack of vegetation, particularly trees. The UHI effect causes people in cities to have higher heat exposure than residents in less densely developed areas. Within urban landscapes, neighborhoods with more impermeable and dark colored surfaces, and fewer trees, parks, and water features, have greater heat exposure and heat related risk than urban communities with more green space and reflective surfaces. These differences in development patterns typically correspond with income and demographic disparities across the urban environment. Low-income communities and many communities of color across Los Angeles County are the most impacted by the urban heat island effect (LA CDPH 2021). UHI will likely compound the impacts and risks of extreme heat days and higher average temperatures resulting from climate change. In some locations, the effect could be twice as strong as the impact of global warming (Huang et al. 2019).

Tree Equity Score

The number and distribution of trees in cities in the United States, often reflects differences in race and income across city landscapes. While the amount of paved and impermeable surfaces and lack of water features and green spaces can increase the impact of temperature increases from climate change, adding more green spaces and especially trees, can have the opposite effect. Trees provide several critical services to cities and residents including shade, improved air quality, increased rain interception and reduced stormwater runoff, and in great enough numbers, trees can cool ambient temperatures and reduce the impact of climate change and extreme heat on public health.

Treeequityscore.org analyzes a range of neighborhood characteristics including the existing tree canopy, population density, income, employment, surface temperature, racial demographics, age distributions, and health metrics to create a single tree equity score between 0 and 100. A score of 100 would indicate that a neighborhood has achieved tree equity.

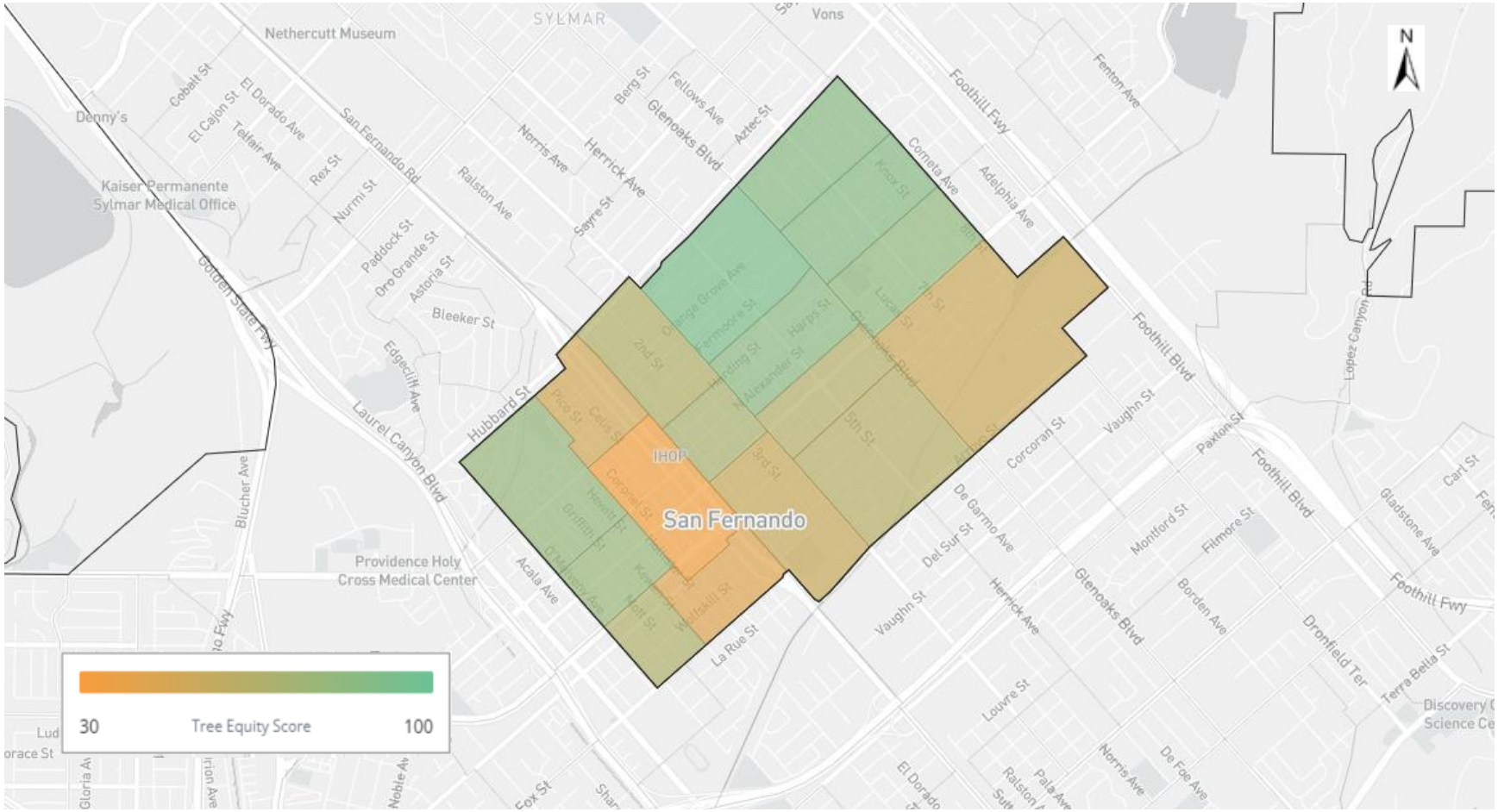
Of the 17 census block groups included in the Tree Equity Score Municipality Report for San Fernando, 10 have a tree equity score below 75. It is estimated that 8,973 trees would need to be planted to get all census blocks to a tree equity score of at least 75. This would increase the total tree canopy of San Fernando by 8.1 percent and result in numerous other annual benefits including those listed below. The estimated annual service benefits from increasing San Fernando's Tree Canopy by 4.6 percent (adding 6,818 trees) include:

- Carbon Sequestered: 176.6 Metric tons
- Runoff Avoided: 6,919 m^3
- Ozone Reduced: 4.7 tons
- Particulate Matter Reduced (PM_{10} and $PM_{2.5}$): 1.3 tons
- Other pollutants reduced: 1.1 tons

The spatial distribution of Tree Equity by census block groups in San Fernando can be found in Figure 4 (American Forests 2023)

The City is undertaking an effort to increase tree planting through the implementation of the 2023 Urban Forest Management Plan (UFMWP). The City and its partners are pursuing funding to implement projects and strategies outlined in the UFMWP.

Figure 4 Municipality Tree Equity Score Map for San Fernando



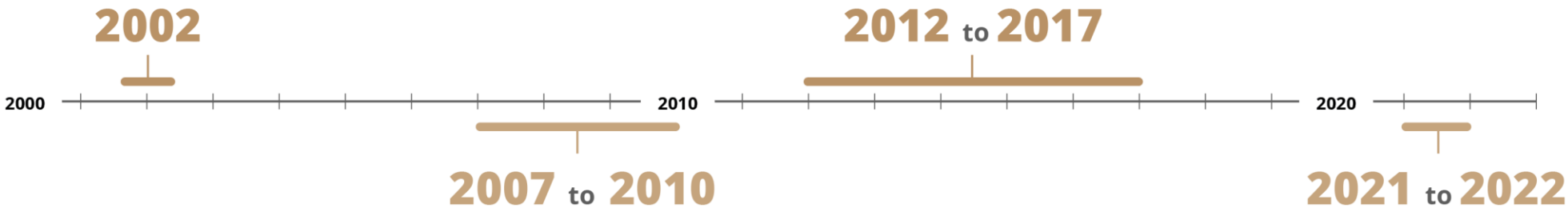
Source: Tree Equity Score Municipality Report for San Fernando

DROUGHT

Past

Over the past two decades, the City of San Fernando has experienced more frequent and longer continuous droughts.

Extreme Drought Events



Present and Future

The City of San Fernando is expected to experience increased drought conditions through the end of the century. There is increased likelihood that low precipitation years will coincide with above-average temperature years. The average annual maximum length of dry spell is projected to increase by 19 days by the end of the century.

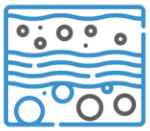
Projected Annual Average Dry Spell Duration

STORMWATER FLOODING

Past

Historically, major flood events in the City of San Fernando are associated with atmospheric rivers. There have been several extreme precipitation events in City of San Fernando with the most severe flood occurring in 1934.

Contributors to Flooding Include:



Local Geomorphology

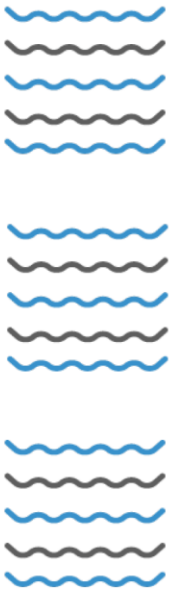
Built Environment

Geography

Present

Current exposure to 100-year and 500-year flood events is low for the City of San Fernando. A significant risk of flooding within the City is associated with failure of the Lopez Dam leading to inundation of the northeast corner of the City in the commercial and industrial strip adjacent to the Pacoima Wash.

City of San Fernando Currently Experiences 3 Atmospheric Rivers per Year

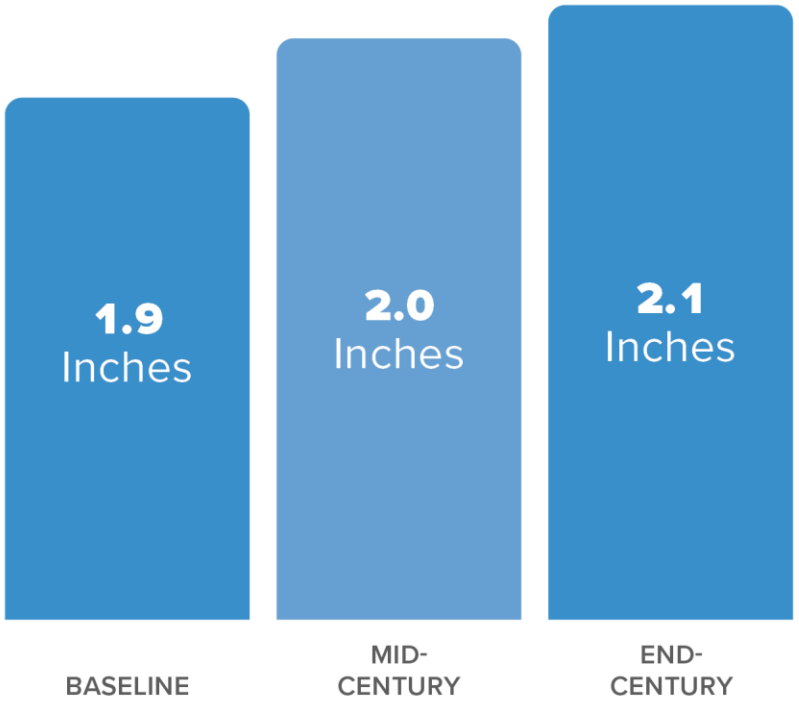


Future

Stormwater systems are designed for a certain rain event based on historical averages. With climate change, the stormwater system could be more frequently overwhelmed when events occur that exceed the storm year design.

The frequency of atmospheric river events may increase in the future with some locations in City of San Fernando and the Los Angeles region experiencing 25-30 percent increases in the wettest annual day.

Maximum One Day Precipitation

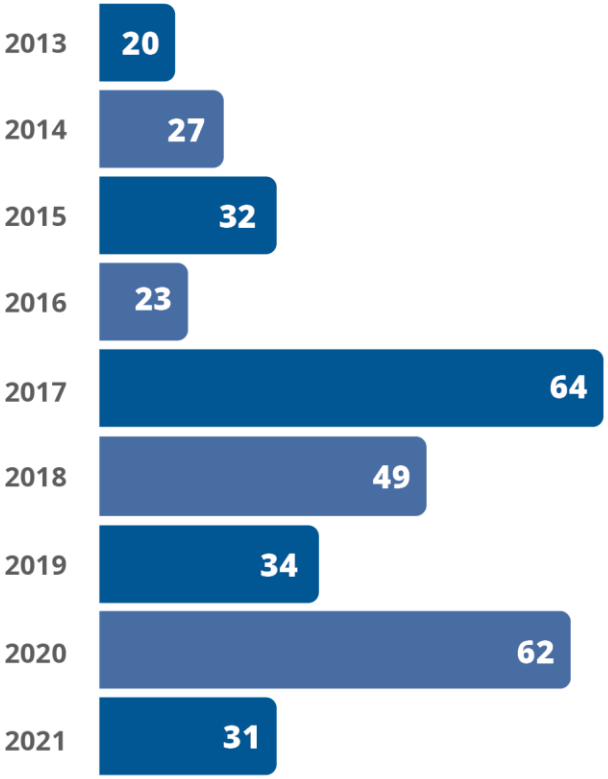


POOR AIR QUALITY

Past

Historic poor air quality events coincide with regional wildfire events, periods of time without wind, extreme heat events, and extended droughts. Data over the last decade indicates an increase in days where ozone levels are above the national standard of 0.070 parts per million (ppm) within the region.

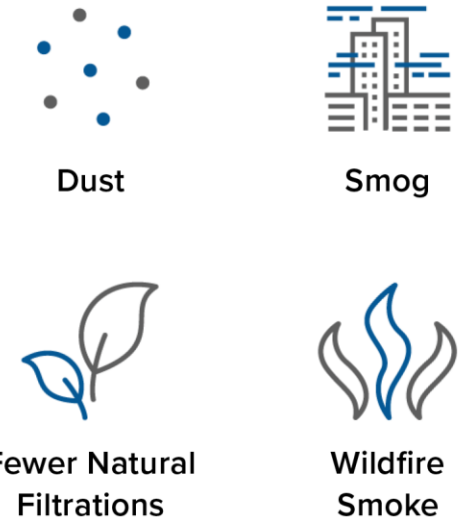
Days Above Standard Ozone Levels



Present

Poor air quality exposure in the City of San Fernando is a common occurence. San Fernando experiences more poor air quality days compared to other areas across the state and even the region. Common types of air quality issues for City of San Fernando include smog and seasonal wildfire smoke.

Types of Air Quality Hazards



Future

Climate change may lead to a decline in air quality regionally, as well as throughout the City of San Fernando. Air quality is expected to worsen in and the Los Angeles region due to extended droughts, more frequent wildfires, increased ambient temperatures, and sporadic natural filtrations of wind.

Hazards Affecting Air Quality

3 Vulnerable Populations, Assets, and Services at Risk

Populations and community assets are affected by climate change depending on their sensitivity to climate hazards. This section identifies vulnerable populations and assets within San Fernando. Section 4 describes potential impacts from the climate hazards of concern on vulnerable populations. Assets are grouped in the following manner:


Vulnerable Populations


Natural and Recreational Resources


Buildings and Facilities


Infrastructure and Critical Services

3.1 Vulnerable Populations


While all people in a community will experience climate change, some may be more affected than others. For example, older adults and young children are at higher risk for experiencing a heat related illness during an extreme heat event. Several factors influence sensitivity to climate hazards including an individual's health, age, and ability, experience of structural inequality, inequities in access to health care, economic opportunity, education and other resources, and inequities found in basic needs and exposure to environmental stressors (Cal OES 2020). These higher-risk populations should be prioritized when considering climate impacts, adopting climate resilience policies, and planning adaptation projects.

In addition to facing greater exposure to and risk from climate change impacts, vulnerable populations often have fewer resources to adapt and recover. Returning to the example of extreme heat, the health risks of extreme heat events are often compounded due to the enhanced formation of air pollutants at ground level when temperatures are higher, in addition to the health risks from the high temperatures. Community members experiencing houselessness have greater exposure to both higher temperatures and reduced air quality and are less likely to have the resources to adapt through access to air conditioning, air filtration, and medical attention should health issues occur. The urban heat island effect amplifies increased nighttime temperatures, which limits the ability of people to cool down and recover before the heat of the next day, thereby adding to the risk of illness and fatalities, especially for populations without access to air conditioning and those living in overcrowded housing.

These kinds of intersections between population characteristics and climate hazard exposure are important for understanding where there is increased risk from climate change in the community. Understanding where climate vulnerability is greater can help to prioritize adaptive capacity building and resilience planning efforts.

Following guidance from the SoCal APG, populations that will likely experience disproportionate impacts from climate change were identified for San Fernando in Table 3. The 26 population data indicators are organized into four separate groups for the purposes

of this assessment. Grouping populations allows the City to understand what systems and structures contribute to increased vulnerability to climate change hazards. Through identification of factors that contribute to population vulnerability, adaptation solutions can be developed that specifically address those contributing factors. Population groupings are as follows:

1. Individuals with High Outdoor Exposure
2. Under-resourced Individuals
3. Individuals Facing Societal Barriers
4. Individuals with Chronic Health Conditions or Health-Related Sensitivities

Table 3 Vulnerable Populations in San Fernando

Population Type	Population Description	City Percentage of Total Population/Household Type
Individuals with High Outdoor Exposure		
Outdoor Workers	Individuals who are employed, 16 and older, and work outdoors	13.7%
People experiencing houselessness[1]	Individuals who currently lack fixed, regular, and adequate housing	0.1%
Visitors[2]	Individuals who are not residents and are visiting the study area for a limited time	Not Available
Individuals Facing Societal Barriers		
Black, Indigenous, and People of Color (BIPOC)	Individuals who do not identify as white	95.8%
Native Americans	Individuals who identify as American Native and Alaskan Native	1.3%
Limited or non-English speakers	Households with individuals who are limited or non-English-speaking	28.1%
Immigrants	Individuals residing in the United States with legal documentation	37.6%
People who are undocumented[3]	Individuals residing in the United States without legal documentation	Not Available
Individuals with Chronic Health Conditions or Health Related Sensitivities		
Older Adults	Individuals 65 years or older	11.8%
Young children	Individuals 5 years and younger	5.7%
People who are differently abled	Individuals with access and functional needs (physical and mental)	12.2%
Individuals with asthma	Individuals diagnosed with asthma	8.48%
Individuals with coronary heart disease	Individuals diagnosed with coronary heart disease	4.8%
Miliary Veterans	Individuals who have served but are not currently serving in the US Armed Forces	2.2%
Under-Resourced Individuals		
People experiencing poverty	Household incomes less than 80% the State median household income	39.1%
Unemployed individuals	Percentage of population aged 18-64 who are unemployed	3.5%
Individuals with no health insurance	Individuals aged 18 to 64 years old currently uninsured	10.6%
Households without a computer	Households without access to a computer	11.4%
Households without broadband internet	Households without access to broadband internet	16%
Renters	Housing units that are renter occupied	40.2%

Population Type	Population Description	City Percentage of Total Population/Household Type
Individuals without vehicle access	Individuals without access to a vehicle	5.9%
Single female heads of household with kids	Households with kids supported by a single female	2.6%
Individuals with education attainment less than 4 years of high school	Percentage of people over age 18 without a high school education or higher	36.2%
People in overcrowded households	Household with more than one person per room	14.9%
Households experiencing housing burden	Household with housing costs exceeding 30 percent of household income	70.9%
Residents without air conditioning	Households without air conditioning	Not Available

[1] People experiencing houselessness percentage is calculated using data from the City of San Fernando Homelessness Action Plan (2022).

[2] Data for visitors was not available at the Census tract or City level for San Fernando.

[3] Data for people who are undocumented was not available at the Census tract or City level for San Fernando.

Source: The percentages used in this table were acquired from the U.S. Census, 2022 ACS and Healthy Places Index.

3.2 Natural and Recreational Resources

Natural and recreational resources within San Fernando as detailed in the Draft Urban Forest Management Plan, Urban Water Management Plan, and Park & Recreation Master Plan, include groundwater resources, mini parks (Cesar E. Chavez Memorial Park, Kalisher Park, and Layne Park), a neighborhood park (Rudy Ortega Sr. Park), community parks (Las Palmas Park, Pioneer Park, and Recreation Park), natural areas (Pacoima Wash Natural Park), City bikeways, and street trees making up the urban forest. These various resources provide sources of community resilience and recreation to the City. The City currently provides 0.75 acres of parkland space for every 1,000 residents, which is significantly less than the statewide standard of five acres per 1,000 residents. These resources are spread throughout the City and face various levels of exposure to climate hazards.

3.3 Buildings and Facilities

Climate change is expected to amplify extreme weather and climate hazards in San Fernando. A jurisdiction's vulnerability increases when buildings and facilities are not designed, operated, and/or maintained to function effectively under extreme weather conditions or can be damaged by extreme weather conditions. Due to the roles they play in supporting general community functioning and hazard response, the following buildings and facilities would be particularly important to assess for climate change impacts: municipal buildings, educational facilities, hospitals, residential and commercial development, roadways and transportation facilities, active transportation routes, fire stations, and police stations. Some key buildings and facilities in San Fernando include:

- City Hall
- LA County Fire Department Fire Station #74
- San Fernando Police Department
- Educational Facilities
- Hospitals and Medical Centers
- Community Centers/Resources
- Transit Stops

3.4 Infrastructure and Critical Services

Within San Fernando, there is a variety of infrastructure and critical services that are vulnerable to climate change. Assets within this category include water services, wastewater, storm drainage and flood protection, solid and hazardous waste and recycling, fire services, emergency services, medical services, utilities and major utility corridors, public transportation, roadways, and active transportation routes. This asset group is sensitive to climate change as the impacts of hazards can affect the ability to provide services and resources; and the infrastructure in place may not be adequately prepared to sustain increasing and compounding hazards. The following public services may be sensitive to the impacts of climate change.

- The City provides all San Fernado residents with potable water sourced from local groundwater wells.
- Critical Water Infrastructure includes:
  - Wells
  - Treatment Facilities
  - Pump Stations
  - Distribution Pipeline

- The San Fernando Public Works Department maintains the City's sewer system.
- The City's wastewater is conveyed to the Hyperion Water Reclamation Plant. The wastewater plant is maintained and operated by the Los Angeles County Sanitation District.
- Stormwater drains in San Fernando are owned and maintained by the Los Angeles County Flood Control District. There are storm drains along the major arterials in the City.
- Southern California Gas Company provides natural gas services to the City.
- Southern California Edison Company provides electricity services to the City.
- The San Fernando Police Department provides police services to the City.
- San Fernando contracts with the Los Angeles County Fire Department for fire services.
- Waste collection is provided by Republic Services.
- San Fernando receives transit services from Mission City Transit Dial-A-Ride vehicles and the Los Angeles County Metropolitan Transportation Authority (Metro) buses.

4 Adaptive Capacity

Adaptive capacity is the ability to adjust to the consequences of climate change. This section summarizes the ways in which the City currently manages the negative impacts of climate change. Types of adaptive capacity include adjustments in behavior, resources, and technologies. The City of San Fernando has actively taken steps to increase the City's adaptive capacity. Existing policies, plans, programs, and institutions that increase the City's resilience to climate change impacts are organized by climate hazard and listed in Table 4.

Table 4 Program, Plans, and Policies to Manage Impacts of Climate Hazards

Existing and Planned Programs, Plans, and Policies	Objectives	Climate Hazard Mitigated
City of San Fernando General Plan	San Fernando's General Plan is a blueprint for meeting the communities long-term vision for the future. The General Plan includes several elements (or sections) including the Safety Element which addresses natural and manufactured hazards that may result in personal injury, loss of life, property damage, or environmental damage. Climate hazards addressed include stormwater flooding, extreme heat, drought, wildfire, and air quality. The Safety Element also includes a description of community vulnerabilities relative to climate hazards of concern.	Extreme Heat, Stormwater Flooding, Air Quality
City of San Fernando Multi-Hazard Mitigation Plan	The Plan assesses hazards within the City and identifies mitigation strategies that reduce or eliminate long-term risks to people and property from those hazards. Climate hazards planned for include drought, flood, severe weather (e.g., extreme heat), and wildfire. The Plan included vulnerability analysis and adaptive capacity considerations for sensitive populations including those that are low-income, immigrants, non-English speaking, racially and ethnically diverse, young, old, or those that have access and functional needs. The Plan contains a series of proposed actions that align with the General Plan, Capital Improvement Plans, and City Building & Safety Codes. Some of these proposed action items include enhancing debris management and building safety measures for stormwater flooding. The plan also mentions the improvement of City water systems, enhancing utility and communications systems for emergency services, and conducting outreach to educate the community about natural hazards.	Extreme Heat, Stormwater Flooding, Drought, Air Quality
Alert San Fernando	San Fernando's Alert Center provides residents who subscribe with text and voice message alerts for emergency updates.	Extreme Heat, Stormwater Flooding, Air Quality

Existing and Planned Programs, Plans, and Policies	Objectives	Climate Hazard Mitigated
Southern California Edison (SCE) Medical Baseline Program	SCE provides assistance to individuals with medical needs for electricity to develop emergency back-up contingency plans in the event of a power outage.	Extreme Heat, Stormwater Flooding
SCE Critical Care Backup Battery Program	SCE offers customers enrolled in the Medical Baseline Program a free portable backup battery to power a medical device in the event or a power outage as well as a solar panel kit, at no cost.	Extreme Heat, Stormwater Flooding
SCE Automated System	SCE regularly communicates with customers in the County during power outages and notifies customers when power will be restored. SCE provides customer service contact numbers for non-English speakers.	Extreme Heat, Stormwater Flooding
SCE Climate Change Vulnerability Assessment (CAVA)	SCE's Climate Adaptation Vulnerability Assessment provides a comprehensive assessment of its infrastructure operations and services and potential impacts in the face of forecasted climate change hazards over time. The Assessment describes SCE's climate adaptation strategies for addressing this risk and keeping communities, including those in San Fernando, safe.	Extreme Heat, Stormwater Flooding
San Fernando Safe and Active Streets Implementation Plan	The Safe and Active Streets Implementation Plan identifies priority projects to make streets in San Fernando safer and more inviting to active transportation options. The Plan outlines existing conditions in the City, community concerns and priorities, and potential projects and strategies. Notably, the Plan includes recommendations from residents to continue planting shade trees to mitigate extreme heat conditions.	Extreme Heat, Stormwater Flooding, Poor Air Quality
City of San Fernando Cooling Centers	San Fernando hosts cooling centers for community members to seek shelter during extreme heat events. Specific locations for cooling centers change year to year but have previously been hosted at Recreation Park and Las Palmas Park in San Fernando.	Extreme Heat
Los Angeles Fire Department Community Emergency Response Team (CERT)	The CERT program is offered by the Los Angeles Fire Department to residents of San Fernando and other Los Angeles area communities to engage in community emergency response and preparedness trainings. Members of the CERT learn about making a disaster plan and important life-safety support techniques.	Stormwater Flooding
City of San Fernando Urban Water Management Plan	The Plan evaluates efficient water uses, reclamation, and conservation activities and analyzes the City's water system, water demands, and projects for future water supply capacity. The Plan details water supply sources, historical, and projected water use, and potential future water supplies during normal, single-dry, and multiple-dry years. The Plan describes climate change impacts on water supplies, specifically relating to groundwater levels and snowmelt. Proposed demand management strategies center around metering, water conservation-related public education and outreach programs, asset management, and wholesale supplier assistance programs	Drought

Existing and Planned Programs, Plans, and Policies	Objectives	Climate Hazard Mitigated
City of San Fernando Draft Urban Forest Management Plan	The Draft Urban Forest Management Plan was developed to maintain and expand San Fernando's urban forest. The plan outlines the key benefits of an urban forest, mental health, outdoor activities, stormwater management, shading and cooling, climate resilience, social cohesion, privacy and noise reduction, food forest, and biodiversity. It reflects community perspectives through the results of a survey that was conducted at workshops. The Plan includes targets and strategies to enhance and grow the urban forest in the City.	Stormwater Flooding, Extreme Heat, Drought, Air Quality

5 Vulnerability Analysis

The following section outlines the impacts each climate hazard has on community assets and services discussed in the preceding section titled Vulnerable Populations, Assets, and Services at Risk. Existing plans, policies, and programs contribute to the adaptive capacity of each community asset and service in San Fernando. An impact score and an adaptive capacity score is identified for each asset by climate hazard, along with an overall vulnerability score consistent with the scoring methodology described in Vulnerability Assessment Methodology.

Vulnerable population groups with the highest risk for impacts are identified in the impact graphics below. However, all the vulnerable populations present in San Fernando face exposure to climate hazards and are susceptible to significant impacts.

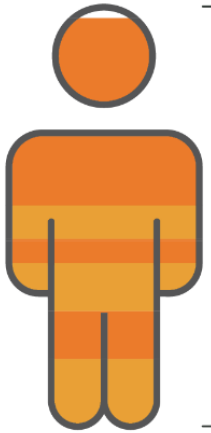
EXTREME HEAT & AIR QUALITY IMPACTS

SAN FERNANDO ENVIRONMENTAL CHARACTERISTICS THAT INCREASE VULNERABILITY

- SUBSTANDARD AND OVERCROWDED HOUSING AND HOUSING ECONOMIC BURDEN
- CLOSE PROXIMITY TO FREEWAYS
- LOW TREE CANOPY SCORE
- HIGH OZONE AND DIESEL PARTICULATE MATTER BURDEN
- LOW PARKLAND PER RESIDENT RATIO

VULNERABLE

POPULATIONS



- **96%** Black, Indigenous, People of Color (BIPOC)
- **9%** Individuals with Asthma
- **6%** Young Children
- **12%** Older Adults
- **12%** People Who Are Differently Abled
- **14%** Outdoor Workers

NATURAL AND RECREATION RESOURCES

STREET TREES AND URBAN CANOPY

NEIGHBORHOOD AND COMMUNITY PARKS

RECREATIONAL CENTERS

CRITICAL FACILITIES, BUILDINGS, SERVICES, AND INFRASTRUCTURE

MEDICAL FACILITIES

COMMUNITY CENTERS

EMERGENCY SERVICES, INCLUDING POLICE & FIRE STATIONS

UTILITY INFRASTRUCTURE

POTENTIAL IMPACTS

MORTALITY

HEAT EXHAUSTION

HEAT STROKE

DEHYDRATION

CARDIOVASCULAR STRESS

RESPIRATORY ISSUES

EXACERBATIONS OF CHRONIC CONDITIONS

MENTAL HEALTH IMPACTS

VEGETATIVE AND WILDLIFE STRESS AND MORTALITY

REDUCED CARBON STORAGE

INCREASED WATER NEEDS AND COSTS

DISRUPTED REPRODUCTIVE CYCLES

REDUCED OUTDOOR RECREATION OPPORTUNITIES

CRACKED STRUCTURES AND PAVEMENT

ENERGY DEMAND STRAIN

BLACKOUTS OR BROWNOUTS

NEGATIVE PERFORMANCE AND LIFESPAN OF MECHANICAL EQUIPMENT

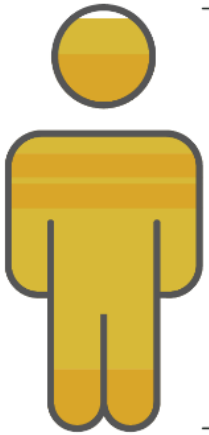
STRAINED EMERGENCY SERVICES

DROUGHT IMPACTS

SAN FERNANDO ENVIRONMENTAL CHARACTERISTICS THAT INCREASE VULNERABILITY

- SUBSTANDARD AND OVERCROWDED HOUSING AND HOUSING ECONOMIC BURDEN
- CLOSE PROXIMITY TO FREEWAYS
- HIGH OZONE AND DIESEL PARTICULATE MATTER BURDEN
- POTABLE WATER IS SOURCED 100% FROM GROUNDWATER

VULNERABLE



- **96%** Black, Indigenous, People of Color (BIPOC)
- **12%** People Who Are Differently Abled
- **12%** Older Adults
- **6%** Young Children
- **0.1%** People experiencing houseless-
- **9%** People experiencing asthma
- **39%** People experiencing poverty
- **15%** People in overcrowded housing

NATURAL AND RECREATION RESOURCES

- STREET TREES AND URBAN CANOPY
- NEIGHBORHOOD AND COMMUNITY PARKS
- RECREATIONAL CENTERS

CRITICAL FACILITIES, BUILDINGS, SERVICES, AND INFRASTRUCTURE

MEDICAL FACILITIES

FIREFIGHTING RESOURCES

EMERGENCY SERVICES

WATER SERVICE INFRASTRUCTURE

POTENTIAL IMPACTS

WATER UTILITY RATE BURDEN

VECTOR BORNE DISEASE (E.G., WEST NILE VIRUS) FROM STAGNANT WATER

DEHYDRATION AND MORTALITY

INCREASED DUST AND AIR PARTICULATES

MENTAL HEALTH CONDITIONS

VEGETATIVE AND WILDLIFE STRESS AND MORTALITY

REDUCED CARBON STORAGE

DISRUPTED REPRODUCTIVE CYCLES

REDUCED OUTDOOR RECREATION OPPORTUNITIES

INCREASED WATER NEEDS AND COSTS

SOIL CRACKING AND SUBSIDENCE LEADING TO

WATER SHORTAGES

WATER USE RESTRICTIONS

STRAINED EMERGENCY SERVICES

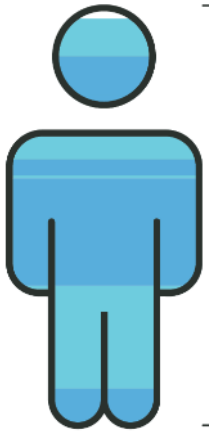
STORMWATER FLOODING IMPACTS

SAN FERNANDO ENVIRONMENTAL CHARACTERISTICS THAT INCREASE VULNERABILITY

- SUBSTANDARD AND OVERCROWDED HOUSING AND HOUSING ECONOMIC BURDEN
- CLOSE PROXIMITY TO FREEWAYS
- LOW TREE CANOPY SCORE
- HIGH OZONE AND DIESEL PARTICULATE MATTER BURDEN
- LOW PARKLAND PER RESIDENT RATIO

VULNERABLE

POPULATIONS



- **96%** Black, Indigenous, People of Color (BIPOC)
- **14%** Outdoor Workers
- **12%** People Who Are Differently
- **12%** Older Adults
- **6%** Young Children
- **0.1%** People experiencing houselessness
- **40%** Renters
- **39%** People experiencing poverty
- **15%** People in overcrowded housing

NATURAL AND RECREATION RESOURCES

- STREET TREES AND URBAN CANOPY
- NEIGHBORHOOD AND COMMUNITY PARKS
- RECREATIONAL CENTERS

CRITICAL FACILITIES, BUILDINGS, SERVICES, AND INFRASTRUCTURE

- MEDICAL FACILITIES

- COMMUNITY CENTERS

- EMERGENCY SERVICES, INCLUDING POLICE & FIRE STATIONS

- UTILITY INFRASTRUCTURE

POTENTIAL IMPACTS

- INJURIES AND DROWNING IN PACOIMA WASH

- DAMAGED BELONGINGS AND HOMES

- COST BURDENS

- CHALLENGES EVACUATING

- INSUFFICIENT MEDICAL SERVICES

- RESPIRATORY ISSUES FROM MOLD

- EXACERBATIONS OF CHRONIC CONDITIONS

- MENTAL HEALTH IMPACTS

- VEGETATIVE AND WILDLIFE STRESS AND MORTALITY

- REDUCED OUTDOOR RECREATION OPPORTUNITIES

- INUNDATED PARKS AND OPEN SPACES

- POLLUTED OR CONTAMINATED RUNOFF

- TRANSIT AND ROAD CLOSURES

- MOLD GROWTH IN HOMES AND FACILITIES

- POWER OUTAGES

- DAMAGED BUILDINGS AND FACILITIES

- CLOGGED STORM DRAINS

- STRAINED EMERGENCY SERVICES

5.1 Community Insight

The Climate Change Vulnerability Assessment survey, distributed to City departments, community-based organization, utilities, and local agencies, provides additional context and information to the climate impacts and vulnerabilities specific to San Fernando.

Vulnerable Populations

As noted by the San Fernando Police Department in the Climate Change Vulnerability Assessment survey, an increase in frequency and severity of extreme heat events will make it more physically demanding for police officers to perform their duties. They may face increased risk of heat stroke and other heat related illnesses.

Natural and Recreational Resources

As noted by Tree People in the survey, trees least adapted to San Fernando's present and future climate conditions are at risk to potentially prematurely dying. Climate hazards that pose particular risk to trees in San Fernando are drought and extreme heat. Also, as noted by community-based organizations in the survey, there is a lack of tree canopy to provide shading, particularly around transit stops. Additionally, respondents noted heavy wind & rain have caused fallen trees on personal property in the City.

Infrastructure and Critical Services

As noted by Southern California Edison in the survey, electrical infrastructure in San Fernando and the Los Angeles Region is at risk to climate hazards, including extreme flooding and wildfire. Existing infrastructure is not currently hardened to address future climate exposure and significant improvements and planning efforts will need to be implemented to increase resilience to minimize impacts on vulnerable populations including individuals with different abilities and older adults.

5.2 Vulnerable Populations

Vulnerable populations in San Fernando will experience significant health impacts associated with worsening air quality and longer and more severe extreme heat events due to climate change. Extended drought conditions also contribute to health impacts and has the risk of contributing to utility rate increases which could be a burden for people experiencing poverty and households experiencing housing burden. San Fernando has some plans and programs in place that protect vulnerable populations against climate hazards, including operating cooling centers and Alert San Fernando, the City's emergency notification system. Additionally, the SCE Medical Baseline Program provides support to individuals with medical needs for electricity. There are limited resources and plans directly increasing the adaptive capacity of San Fernando's vulnerable populations to air quality.

Vulnerability Score for Vulnerable Populations

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	High	Low	**5-High**
Drought	Medium	Medium	**3-Medium**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	High	Low	**5-High**

5.3 Natural & Recreational Resources

Natural and recreational resources in San Fernando will experience impacts including species mortality, loss of habitat, and reduced opportunity for outdoor recreation due to more extreme and frequent climate hazard events. San Fernando has some plans and programs in place that protect natural and recreational resources against climate hazards. These include the Urban Water Management Plan and the Draft Urban Forest Management Plan, which seek to mitigate drought, extreme heat, and air quality impacts on natural resources in San Fernando. Specifically, the Draft Urban Forest Management Plan outlines strategies to increase the stormwater capture and climate resilience of San Fernando's urban forest to drought, and extreme heat conditions. There are limited resources and plans directly increasing the adaptive capacity of San Fernando's natural and recreational resources to stormwater flooding.

Vulnerability Score for Natural & Recreational Resources

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	High	Medium	**4-High**
Drought	High	Low	**5-High**
Stormwater Flooding	Low	Low	**2-Low**
Air Quality	Medium	Low	**4-High**

5.4 Buildings and Facilities

Buildings and facilities in San Fernando may not function effectively and may experience physical damage under extreme weather conditions, including stormwater flooding. Extreme heat and poor air quality may impact occupants of buildings and facilities that are not adequately weatherized for increased temperatures and air particulates, however, the buildings and facilities themselves are not at risk to extreme heat. Drought may cause increased soil cracking and subsidence in areas with low groundwater tables which may damage building foundations. San Fernando has some plans and programs in place that protect buildings and facilities against climate hazards. Notably, the City's Local Hazard Mitigation Plan outlines strategies to reduce climate hazard impacts, including stormwater flooding and extreme heat, on buildings and facilities. Other than the Local Hazard Mitigation Plan, there are limited resources and plans directly increasing the weatherization of buildings and facilities in San Fernando.

Vulnerability Score for Buildings and Facilities

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	Low	Medium	**2-Low**
Drought	Low	Medium	**2-Low**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	Low	Medium	**2-Low**

5.5 Infrastructure and Critical Services

Infrastructure and critical services that support San Fernando communities may experience disruptions and damage from climate hazards. Extreme heat events may lead to impacts on electricity services as increased demand may lead to blackouts and/or power safety shutoffs. Storm drains, flood protection services, utility infrastructure, and emergency services may be impacted by extreme precipitation events. Drought conditions may strain the City's potable water services, as the local groundwater supplies the City is reliant on are particularly vulnerable. City and utility plans and programs, including the Urban Water Management Plan and SCE's Climate Adaptation Vulnerability Assessment, seek to increase the resilience of the City's water supplies and regional electricity infrastructure, respectively. There are limited resources and plans directly increasing the adaptive capacity of San Fernando's infrastructure and critical services to air quality.

Vulnerability Score for Services and Infrastructure

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	High	Medium	**4-High**
Drought	High	Medium	**4-High**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	Medium	Low	**4-High**

6 Conclusion

This report evaluates how climate change may impact community members, natural resources, critical facilities, buildings, services, and infrastructure in San Fernando. The report provides a list of vulnerable populations and community assets for which adaptation policies and programs should be developed and implemented to increase community resilience. Vulnerability scoring is based on the combination of potential impacts and adaptive capacity, as discussed in more detail in the section titled Vulnerability Assessment Methodology.

A list of asset categories with high vulnerability scores is provided on the next page.

- All vulnerable population groups present in San Fernando are at high risk from poor air quality and extreme heat impacts and at medium risk from drought and stormwater flooding impacts.
- Natural resources are at high risk from extreme heat, drought, and poor air quality impacts, and are at low risk to stormwater flooding impacts. Vulnerability for natural resources is related to damage or strain on recreational resources as well as mortality and scarcity of resources for plants and wildlife.
- Buildings and facilities are ranked as having a medium risk to stormwater flooding impacts and low risk to extreme heat, drought, and air quality impacts.
- Infrastructure and critical facilities are at high risk to extreme heat, drought, and poor air quality impacts and medium risk to stormwater flooding impacts. Infrastructure and dependent populations experience additional cascading impacts from power outages caused by downed utility lines and power safety shut offs.

Table 5 High Vulnerability Scores

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Vulnerable Populations			
Extreme Heat	High	Low	**5-High**
Air Quality	High	Low	**5-High**
Natural & Recreational Resources			
Extreme Heat	High	Medium	**4-High**
Drought	High	Low	**5-High**
Air Quality	Medium	Low	**4-High**
Infrastructure & Critical Services			
Extreme Heat	High	Medium	**4-High**
Drought	High	Medium	**4-High**
Air Quality	Medium	Low	**4-High**

7 References

California Governor's Office of Emergency Services (Cal OES). 2020. *California Adaptation Planning Guide*. https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf

California Energy Commission (CEC). Cal-Adapt Local Climate Change Snapshot for San Fernando. 2023. https://cal-adapt.org/tools/local-climate-change-snapshot/

California Department of Public Health (CDPH). 2014. "Average Daily Maximum Ozone Concentration." https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/CHVIs/BRACE_Ozone_801_Narrative.pdf

California Department of Public Health (CDPH). 2020. "Climate Change and Health Vulnerability Indicators for California." https://www.cdph.ca.gov/Programs/OHE/Pages/CC-Health-Vulnerability-Indicators.aspx

California Air Resources Board (CARB). 2022. "Overview Diesel Exhaust & Health." https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health (accessed February 2022).

City of San Fernando. 2021. General Plan – Safety Element and Environmental Justice Element. https://ci.san-fernando.ca.us/wp-content/uploads/2021/12/Safety-ElementUpdate_December2021_DRAFTred.pdf

City of San Fernando. 2021. Multi-Hazard Mitigation Plan. https://ci.san-fernando.ca.us/wp-content/uploads/2021/09/San-Fernando-MHMP-8.23.2021-.pdf

City of San Fernando. 2023. Alert San Fernando. https://ci.san-fernando.ca.us/alert-san-fernando/

City of San Fernando. 2021. Safer and Active Streets Implementation Plan. https://ci.san-fernando.ca.us/wp-content/uploads/2022/01/San-Fernando-Plan_01032021.pdf

City of San Fernando. 2019. Visit A Cooling Center. https://ci.san-fernando.ca.us/wp-content/uploads/2019/09/Cooling-Centers-2019.pdf

City of San Fernando. 2021. Urban Water Management Plan. https://ci.san-fernando.ca.us/wp-content/uploads/2021/06/San-Fernando_2020-UWMP_Public-Draft_2021-06-02.pdf

City of San Fernando. 2023. Draft Urban Forest Management Plan.

Cooley Heather, Eli Moore, Matthew Heberger, and Lucy Allen. 2012. "Social Vulnerability to Climate Change in California." https://pacinst.org/wp-content/uploads/2012/07/social-vulnerability-climate-change-ca.pdf

Gamble & Balbuls. 2016. "The Impacts of Climate Change on Human Health in the United States."

GAO (United States Government Accountability Office). Disaster Recovery: School Districts in Socially Vulnerable Communities Faced Heightened Challenges After Recent Natural Disasters. January 2022. Accessed at: <https://www.gao.gov/assets/gao-22-104606.pdf>

Hall Alex, Neil Berg, and Katharine Reich. (University of California, Los Angeles). 2018. *Los Angeles Summary Report California's Fourth Climate Change Assessment.* https://www.energy.ca.gov/sites/default/files/2019-11/Reg%20Report-%20SUM-CCCA4-2018-007%20LosAngeles_ADA.pdf

Intergovernmental Panel on Climate Change (IPCC). 2012. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. [A special report of Working Groups I and II of the IPCC, ed. C. B.] https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_FD_SPM_final-2.pdf

IPCC. *The Intergovernmental Panel on Climate Change Sixth Assessment Report*. 2021. https://www.ipcc.ch/report/ar6/wg1/#FullReport.

LA County Department of Public Health (LA CDPH). N.d. "Extreme heat: What DPH is Doing." http://publichealth.lacounty.gov/eh/climatechange/ExtremeHeatDPH.htm#:~:text=The%20urban%20heat%20island%20effect,the%20urban%20heat%20island%20effect.

Liu JC, Mickley LJ, Sulprizio MP, Dominici F, Yue X, Ebisu K, Anderson GB, Khan RFA, Bravo MA, Bell ML. 2016. "Particulate Air Pollution from Wildfires in the Western US under Climate Change." *National Library of Medicine*. doi: 10.1007/s10584-016-1762-6.

Los Angeles County. 2021. LA County Climate Vulnerability Assessment. https://ceo.lacounty.gov/wp-content/uploads/2021/10/LA-County-Climate-Vulnerability-Assessment-1.pdf

Los Angeles Fire Department. N.d. Community Emergency Response Team (CERT). https://www.lafd.org/join/volunteer/cert

Office of the State Fire Marshall (OSFM). Fire Hazard Severity Zones (FHSZ). https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildfire-preparedness/fire-hazard-severity-zones/

Seneviratne, S.I., Et.al. 2012. "Changes in climate extremes and their impacts on the natural physical environment," In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 109-230. https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap3_FINAL-1.pdf

Tree Equity Score. Tree Equity Score Municipality Report for San Fernando. https://treeequityscore.org/reports/place/huntington-park-ca/

x

The National Aeronautics and Space Administration (NASA). 2022. "The Effects of Climate Change." https://climate.nasa.gov/effects/

Southern California Association of Governments (SCAG). 2020. Southern California Adaptation Planning Guide. https://scag.ca.gov/sites/main/files/file-attachments/socaladaptationplanningguide_oct2020_0.pdf

Southern California Edison. N.d. Medical Baseline Allowance. https://www.sce.com/residential/assistance/medical-baseline

Southern California Edison. N.d. Critical Care Backup Battery Program. https://www.sce.com/outage-center/customer-resources-and-support/critical-care-backup-battery-program

Southern California Edison. 2022. Climate Adaptation Vulnerability Assessment. https://www.sce.com/about-us/environment/climate-adaptation

USEPA. 2021. "Criteria Air Pollutants." https://www.epa.gov/criteria-air-pollutants (accessed February 2021).

USDA Forest Service. 2002. "The Effects of Urban Trees on Air Quality." https://www.nrs.fs.fed.us/units/urban/local-resources/downloads/Tree_Air_Qual.pdf.

USEPA. 2021. "Why Wildfire Smoke is a Health Concern." https://www.epa.gov/wildfire-smoke-course/why-wildfire-smoke-health-concern

USEPA. (n.d.) "Research on Health Effect from Air Pollution." https://www.epa.gov/air-research/research-health-effects-air-pollution#health-effects-vulnerable-pops

Warren, R. (2022). 2020 American Community Survey: Use with Caution, An Analysis of the Undercount in the 2020 ACS Data Used to Derive Estimates of the Undocumented Population. Journal on Migration and Human Security, 10(2), 134–145. https://doi.org/10.1177/23315024221102327

Appendix D

Greenhouse Gas Inventory Analysis Report

City of San Fernando CARP

Greenhouse Gas Inventory Report

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Tables

Figures

1 Introduction

This document presents the data, methods, and results for the 2021 greenhouse gas (GHG) emissions inventory for the City of San Fernando (the City). Included is an analysis of findings and trends in the City's GHG emissions developed to ultimately support the City's GHG emissions reduction targets and the City's Climate Action and Resilience Plan (CARP).

California (the State) has set statewide GHG emissions reduction goals to mitigate negative climate change impacts and transition the State to a low-carbon economy. In particular, the State has established goals to reduce statewide GHG emissions 40 percent below 1990 levels by 2030, established by Senate Bill (SB) 32 and achieve net zero GHG emissions as soon as possible, but no later than 2045, as established by Assembly Bill (AB) 1279.[1] The California Air Resources Board (CARB) is the agency responsible for addressing these goals and developing strategies to achieve them.

Local governments play a fundamental role in reducing local GHG emissions and preparing for a more resilient future. Local government policies can influence high-emissions behavior and mitigate climate change effects.[2] To this end, the City is developing a CARP to align with SB 32 and AB 1279 goals, increase resilience and climate change preparedness, maintain healthy natural resources, and improve community health and the local economy. Phase 1 of the CARP includes the 2021 GHG inventory for the community (2021 Community GHG Inventory) and the municipal operations inventory (2021 Municipal GHG Inventory). Phase 2 of the CARP, to begin in 2024, will build upon the 2021 Community GHG Inventory and 2021 Municipal GHG Inventory through the development of emission forecasts for 2030, 2035, 2040, and 2045. Based on the inventory and forecasted emissions, the City will set emission targets in alignment with the State's goals. Municipal GHG emissions are a subset of community GHG emissions and are, therefore, not additive and are instead included in the Community GHG Inventory.

The 2021 Community GHG Inventory completed for the City includes GHG emissions from activities within the City's jurisdictional boundaries during 2021. Like all GHG inventories, the analysis in this document relies on the best available data and calculation methodologies currently available.

[1] AB 1279 defines net zero GHG emissions as reducing GHG emissions at least 85 percent below 1990 levels. California also set a goal to reach 1990 levels by 2020, as established by AB 32, The 2020 goal set by AB 32 was achieved by the State in 2016. CARB. Frequently Asked Questions – California's 2022 Climate Scoping Plan. Accessed at: https://ww2.arb.ca.gov/sites/default/files/2022-06/2022_Scoping_Plan_FAQ_6.21.22.pdf

[2] CARB. 2022 Scoping Plan for Achieving Carbon Neutrality. Accessed at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

2 Background

2.1 Legislative Context

The State has developed legislative goals and programs to reduce GHG emissions. CARB has issued guidance concerning the establishment of GHG emissions reduction targets for jurisdictions so local communities can contribute their fair share towards the States achievement of the GHG emissions reductions goals. In the first Climate Change Scoping Plan (hereafter referred to as the 2008 Scoping Plan), CARB encouraged local governments to adopt a reduction target for their own community emissions that parallels the State commitment to reduce GHG emissions.[3] In 2017, CARB published the 2017 Climate Change Scoping Plan (hereafter referred to as the 2017 Scoping Plan Update) outlining the strategies the State will employ to reach the additional State targets set by SB 32.[4]

On December 15, 2022, the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) was published and includes recommendations for achieving the goal of carbon neutrality by 2045 codified by AB 1279.[5]

The State of California has adopted legislation and policies to address climate change, the most relevant of which are summarized below.

- **Executive Order S-3-05**, signed in 2005, establishes statewide GHG emissions reduction goals to achieve long-term climate stabilization as follows: by 2020, reduce GHG emissions to 1990 levels and by 2050, reduce GHG emissions to 80 percent below 1990 levels. The 2050 goal was accelerated by the 2045 carbon neutrality goal established by EO B-55-18 and codified by AB 1279, as discussed below.
- **Assembly Bill 32**, known as the Global Warming Solutions Act of 2006, requires California's GHG emissions be reduced to 1990 levels by the year 2020 (approximately a15 percent reduction from 2005 to 2008 levels). The 2008 Scoping Plan identifies mandatory and voluntary measures to achieve the statewide 2020 GHG emissions limit.
- **Senate Bill 32**, signed in 2016, establishes a statewide mid-term GHG emissions reduction goal of 40 percent below 1990 levels by 2030. CARB formally adopted the 2017 Scoping Plan Update in December 2017, laying the roadmap to achieve 2030 goals and giving guidance to achieve substantial progress toward the 2050 State goals. The 2022 Scoping Plan provides further guidance for reaching the State's SB 32 goal.
- **Executive Order B-55-18**, signed in 2018, expanded upon EO S-3-05 by creating a statewide GHG emissions goal of carbon neutrality by 2045. EO S-55-18 identifies CARB as the lead agency to develop a framework for implementation and progress tracking toward this goal in the 2022 Scoping Plan Update.

[3] CARB. Climate Change Scoping Plan: A Framework for Change. Dec. 2008. Accessed at: ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/document/adopted_scoping_plan.pdf

[4] CARB. California's 2017 Climate Change Scoping Plan. Accessed at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

[5] CARB. Draft 2022 Scoping Plan Update. Accessed at: https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf

- **Assembly Bill 1279**, known as the California Climate Crisis Act, signed by the governor in 2022, codifies the GHG emissions reduction goals of achieving carbon neutrality by 2045 and expands upon this goal to define carbon neutrality as reducing direct emissions 85 percent below 1990 levels and removing the remaining 15 percent of emissions via other technologies and practices, like carbon sequestration. The 2022 Scoping Plan provides the pathway for reaching the State's AB 1279 goal.

2.2 Climate Science Context

Greenhouse Gases

GHGs are chemical compounds found in the Earth's atmosphere which affect climate conditions by trapping infrared radiation from sunlight which can serve to raise global temperatures. Emissions can occur from natural processes as well as human activities which release excess GHGs into the atmosphere. GHG emissions quantification frameworks have been developed over the years to standardize GHG accounting, particularly for GHG emissions generated from human activities. The International Council for Local Government Initiatives (ICLEI) protocols for community and municipal inventories (discussed further in Section 3 and Section 4, respectively) assess GHG emissions associated with the six internationally recognized GHGs, as outlined in Table 1. The 2021 inventories focus on the three GHGs most relevant to the City's operations: carbon dioxide (CO_2), nitrogen dioxide (N_2O), methane (CH_4). The other gases (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluorides) are emitted primarily in private sector manufacturing and electricity transmission and are, therefore, omitted from the inventory. This approach is consistent with typical community and municipal inventory best practices, as industrial emissions are typically outside of the City's jurisdictional control. Table 1 also includes the global warming potentials (GWP) for each gas. The 2021 inventories used 100-year GWP for each gas that are consistent with the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report,[6] which were also used by the State in their latest GHG emissions inventory. The GWP refers to the ability of each gas to trap heat in the atmosphere. For example, one pound of methane gas has 28 times more heat capturing potential than one pound of carbon dioxide gas. GHG emissions are reported in metric tons of CO_2 equivalent (MT CO_2e).

Table 1 2021 Inventory GHGs and GWPs

Greenhouse Gas	Primary Source	100-year GWP
Carbon dioxide (CO_2)	Combustion	1
Methane (CH_4)	Combustion, anaerobic decomposition of organic waste (e.g., in landfills, wastewater treatment plants)	28
Nitrous Oxide (N_2O)	Leaking refrigerants and fire suppressants	265
Hydrofluorocarbons	Leaking refrigerants and fire suppressants	4 - 12,400
Perfluorocarbons	Aluminum production, semiconductor manufacturing, HVAC equipment manufacturing	6,630 - 11,100
Sulfur Hexafluoride (SH_6)	Transmission and distribution of power	23,500

Source: Intergovernmental Panel on Climate Change (IPCC). 2014. AR5 Synthesis Report: Climate Change 2014. Available at: https://www.ipcc.ch/report/ar5/syr/

[6] Intergovernmental Panel on Climate Change (IPCC). 2014. AR5 Synthesis Report: Climate Change 2014. Accessed at: https://www.ipcc.ch/report/ar5/syr/

3 GHG Emissions Inventory - Community

Conducting a GHG emissions inventory provides a comprehensive understanding of a jurisdiction's GHG emissions, and may be developed to serve the following purposes:

- Establish perspective of GHG emissions conditions in the applicable inventory year.
- Provide an understanding of where the highest sources of GHG emissions in the jurisdiction originate and where the greatest opportunities for emissions reduction exist.
- Create a GHG emissions baseline from which the jurisdiction can establish a forecast, reduction targets, and track progress over time.

GHG inventories are developed by identifying the sources and sinks (sectors) for GHGs within the geographic or system boundary of interest (e.g., the City of San Fernando), establishing activity data for each sector, and applying an emissions factor to determine the CO_2e. There are often many potential sectors contributing to the jurisdiction's GHG emissions. The GHG emissions sectors used for the City's GHG inventory are identified in Section 3.

3.1 Methodology

The City's 2021 Community GHG Inventory was developed in alignment with accounting protocols provided by the ICLEI protocols, which are designed for local-scale accounting of GHG emissions that contribute to climate change and provide authoritative guidance to account for GHG emissions accurately and consistently. The ICLEI U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions Version 1.2 (Community Protocol) serves to guide the measurement and reporting of GHG emissions in a standardized way and is used by other jurisdictions to support their own inventory, forecast, and climate action planning efforts. The Community Protocol also includes steps to evaluate the relevance, completeness, consistency, transparency, and accuracy of data used in the GHG inventory.

Emissions Boundary

The City's Community GHG Inventory covers the relevant emissions sources within the boundary of the City of San Fernando. The inventory thereby reflects emissions over which the City, including residents and businesses, has direct control.

Scope

The Community Protocol recommends reporting GHG emissions from five basic reporting activities in a community inventory, which include:

- Use of electricity by the community
- Use of fuel in residential and commercial stationary combustion equipment
- On-road passenger and freight motor vehicle travel
- Use of energy in potable water and wastewater treatment and distribution
- Generation of solid waste by the community

The Community Protocol also provides recommendations for additional GHG emissions source reporting for activities that can be influenced by the accounting agency. Based on reporting practices in California, it is recommended that GHG emissions from off-road equipment fuel combustion and wastewater treatment processes are also included in community GHG emissions inventories. The full selection GHG emissions sources can be categorized more generally into the following five activity sectors:

- Electricity
- Natural Gas
- Transportation
- Water and Wastewater
- Solid Waste

The City's 2021 Community GHG Inventory includes an assessment of the communitywide GHG emissions associated with these five sectors.

3.2 2021 Community GHG Emissions Inventory

Generally, GHG emissions were calculated by multiplying the activity data in each GHG emissions sector (e.g., transportation, energy, waste, water) by an associated emission factor. Activity data refer to the relevant measured or estimated energy usage or GHG-generating process data. Emission factors are observation-based conversion factors used to equate activity data to generated GHG emissions. The 2021 Community GHG Inventory leverages the latest available models and best available data in accordance with the Community Protocol. The inventory serves to provide a comprehensive understanding of the community's current GHG emissions. The following sections contain further information on the inventory approach, calculation methodologies, data used, and results.

3.2.1 Energy

Energy: Residential and Nonresidential Electricity

The community's residential and nonresidential sectors source electricity from Southern California Edison (SCE). SCE provided the activity data through electricity usage reports for the residential sector and nonresidential sector (including commercial, agriculture, and industrial sectors[7]).

Emissions from residential and nonresidential electricity were calculated using Community Protocol Equation BE.2.1. The equation has been adjusted to remove electricity consumed by electric vehicles (EVs) by removing electric vehicle (EV) passenger car electricity use from residential electricity consumption and commercial and bus EV electricity consumption from nonresidential consumption. Electricity use from passenger, commercial, and bus EVs are added back into the inventory under the transportation sector to provide a more thorough differentiation between building and transportation sector emissions. More information regarding electric vehicle energy use can be found in Section 3.2.2. Equation 3.1 and Table 2 provide the adjusted equation,

[7] San Fernando's communitywide electricity data was provided by SCE with the industrial sector aggregated into the non-residential sector. This data could not be parsed out and therefore was included in the 2021 Community inventory.

associated parameters, and data sources used to quantify GHG emissions associated with community electricity consumption.

EQUATION 3.1

BE.2.1 RESIDENTIAL/NONRESIDENTIAL ELECTRICITY SECTOR EMISSIONS

$$CO_2e_{electricity,j} = \sum_i \left(Elec_{i,j} - EV_{i,j}\right) \times EF_{elec,i,j} \quad 3.1$$

Table 2 Emissions Parameters and Data Sources – Community Electricity Use

Definition	Parameter	Value	Unit	Data Source
Annual GHG emissions from electricity consumption per building type	$CO_2e_{electricity,j}$	See Table 4	MT CO_2e/year	Calculated
Electricity consumption per building type per energy provider	$Elec_{i,j}$	See Table 3 below shows the SCE provided electricity activity data, allocated EV electricity use data, and subsequent building activity data used to determine GHG emissions for the community's electricity consumption in the built environment. Table 3	kWh/year	SCE 2021 Electricity Report[1]
Attributed electric vehicle electricity consumption	$EV_{i,j}$	See Table 3 below shows the SCE provided electricity activity data, allocated EV electricity use data, and subsequent building activity data used to determine GHG emissions for the community's electricity consumption in the built environment. Table 3	kWh/year	EMFAC2021[2]
Electricity emission factor based on energy provider	$EF_{elec,i,j}$	See Table 4	MT CO_2e/kWh	SCE 2021 Power Content Label[3]
Energy Providers	i	SCE	Categorical	N/A
Building type	j	Residential Nonresidential[4]	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; MWh = megawatt hour; N/A = Not Applicable

1. SCE 2021 Electricity Report provided by the City via email.

2. California Air and Resources Board. 2023. Emission FACtor (EMFAC2021 v1.0.1) Model. Available at: https://arb.ca.gov/emfac/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

3. California Energy Commission (CEC). 2023. 2021 Power Content Label submitted by Southern California Edison. Available at: https://www.energy.ca.gov/filebrowser/download/4676

4. Nonresidential includes kWh consumption from commercial, agricultural, and industrial sources.

Table 3 below shows the SCE provided electricity activity data, allocated EV electricity use data, and subsequent building activity data used to determine GHG emissions for the community's electricity consumption in the built environment.

Table 3 Community Residential and Nonresidential Electricity Activity Data Adjustment

Sector	Provider	Original Activity Data [kWh]	Attributed EV[1] [kWh]	Adjusted Activity Data [kWh]
Residential	SCE	38,747,551	1,446,819	37,300,732
Nonresidential[2]	SCE	78,770,213	2,825	78,767,388

Notes: kWh = kilowatt hour; MT CO_2e = Metric tons of carbon dioxide equivalent; EV = electric vehicles

1. Attributed EV allocates electric vehicle kWh consumption to each provider based on the vehicle type, electricity sector, and proportion of electricity provided by each provider per sector. EV kWh usage from passenger vehicles is removed from residential electricity, while commercial and bus EV kWh usage is removed from nonresidential electricity.

2. Nonresidential includes kWh consumption from commercial, agricultural, and industrial sources.

Resulting activity data, emissions factors, and GHG emissions per building type and provider is summarized in Table 4.

Table 4 Community Residential and Nonresidential Electricity GHG Emissions Calculations

Sector	Provider	Adjusted Activity Data [kWh]	Emission Factor [MT CO2e/kWh]	GHG Emissions [MT CO_2e]
Residential	SCE	37,300,732	0.000263	9,813
Nonresidential	SCE	78,767,388	0.000263	20,722

Notes: kWh = kilowatt hour; MT CO_2e = Metric tons of carbon dioxide equivalent

Energy: Electricity Transmission and Distribution Losses

Electricity Transmission and Distribution (T&D) losses arise from electricity lost during delivery to the buildings and associated end-uses in the City. Electricity T&D losses occur in the electricity transmission and distribution system and are, therefore, upstream of the delivery endpoints located within the City's jurisdictional boundaries. This means this electricity is lost before it is counted. However, T&D losses are estimated and included in the 2021 Community GHG Inventory as they are associated with energy usage in the City and thereby directly impacted by the community's electricity consumption. Additionally, emissions from T&D losses are recommended for inclusions in community GHG inventories by the Community Protocol. Equation 3.2 and Table 5 provide the calculation method, associated parameters, and data sources used to quantify GHG emissions associated with community T&D losses from electricity consumption. T&D losses associated with EV electricity use are considered negligible and therefore are included in the quantification of residential and nonresidential electricity T&D.

EQUATION 3.2

BE.4 ELECTRICITY T&D LOSS SECTOR EMISSIONS

$$CO_2e_{T\&D,j} = \sum_i Elec_{i,j} \times L_{T\&D} \times EF_{elec,i,j} \quad 3.2$$

Table 5 Emissions Parameters and Data Sources – Community Electricity T&D Loss

Definition	Parameter	Value	Unit	Data Source
Annual GHG emissions from transmission and distribution losses per building type	$CO_2e_{T\&D,i}$	See Table 6	MT CO_2e/year	Calculated
Electricity consumption per energy provider and building type	$Elec_{i,j}$	See Table 6	MWh/year	SCE 2021 Electricity Report[1]
Electricity emissions factor per energy provider and building type	$EF_{elec,i,j}$	See Table 6	MT CO_2e/MWh	SCE 2021 Power Content Label[2]
Electricity loss factor	$L_{T\&D}$	4.40%	Percent	EPA eGRID[3]
Energy Providers	i	SCE	Categorical	N/A
Building type	j	Residential Nonresidential[4]	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; MWh = megawatt hour; N/A = Not Applicable

1. SCE 2021 Electricity Report provided by the City via email.

2. California Energy Commission (CEC). 2023. 2021 Power Content Label submitted by Southern California Edison. Available at: https://www.energy.ca.gov/filebrowser/download/4676

3. Environmental Protection Agency (EPA). 2023. eGRID Data Explorer 2021 Western Energy Grid. Available at: https://www.epa.gov/egrid/data-explorer

4. Nonresidential includes kWh consumption from commercial, agricultural, and industrial sources.

The activity data, emissions factors, and GHG emissions associated with electricity T&D losses is summarized in Table 6 per building type and provider.

Table 6 Community Electricity T&D Loss GHG Emissions Calculations

Sector	Provider	Activity Data [kWh]	T&D Losses [kWh][1]	Emission Factor [MT CO_2e/kWh][2]	GHG Emissions [MT CO_2e]
Residential	SCE	38,747,551	1,704,892	0.000263	449
Nonresidential	SCE	78,770,213	3,465,889	0.000263	912

Notes: kWh = kilowatt hour; MT CO_2e = Metric tons of carbon dioxide equivalent

1. T&D losses include the kWh consumption associated with EV charging.

Energy: Residential and Nonresidential Natural Gas

GHG emissions from natural gas result from the stationary combustion of natural gas in both the residential and nonresidential building sectors. The City's natural gas is supplied by Southern California Gas Company (SoCalGas) which provided activity data through natural gas usage reports. GHG emission calculations are based on natural gas used in residential and nonresidential buildings (i.e., commercial and industrial[8]).

Emissions from residential and nonresidential natural gas use were calculated using Community Protocol Equation BE.1.1. Though the majority of GHG emissions result from the combustion of natural gas, not all the natural gas used is combusted. Natural gas that leaks from pipes and processing plants has a larger GHG impact compared to combusted natural gas due to the higher global warming potential of methane. Some natural gas also leaks from fittings and appliances within a building, after the natural gas meter which is used to quantify total gas usage. Therefore,

[8] Industrial natural gas emissions were included in the 2021 Community Inventory to be consistent with the electricity emissions calculations, which also accounts for the industrial sector.

the methodology outlined in the Community Protocol has been adjusted to remove this small percentage of "behind the meter" natural gas from the combustion calculation, and instead count it as leakage. More information regarding emissions associated with natural gas leaks can be found under the "Energy: Natural Gas Methane Leaks" subsection below. Equation 3.3 and Table 7 provide the adjusted equation, associated parameters, and data sources used to quantify GHG emissions associated with community natural gas consumption in residential and nonresidential buildings.

EQUATION 3.3

BE.1.1 RESIDENTIAL/NONRESIDENTIAL NATURAL GAS SECTOR EMISSIONS

$$CO_2e_{NatGas,i} = \left(Fuel_{NG,i} - [1 - L_{enduse}]\right) \times \left[\left(EF_{NG,CO_2} \times GWP_{CO_2}\right) + \left(EF_{NG,CH_4} \times GWP_{CH_4}\right) + \left(EF_{NG,N_2O} \times GWP_{N_2O}\right)\right] \times 10^{-1} \times 10^{-3} \quad (3.3)$$

Table 7 Emissions Parameters and Data Sources – Community Natural Gas Use

Definition	Parameter	Value	Unit	Data Source
Annual GHG emissions from stationary combustion of natural gas per building type	$CO_2e_{NatGas,i}$	See Table 8	MT CO_2e/year	Calculated
Natural gas consumed per building type	$Fuel_{NG,i}$	See Table 8	therms/year	SoCalGas Natural Gas Report[1]
Percent natural gas lost during consumer end-use	L_{enduse}	0.50%	Percent	Environmental Defense Fund[2]
Carbon dioxide emission factor for natural gas combustion	EF_{NG,CO_2}	53.06	kg CO_2/mmBTU natural gas	EPA Emission Factors Hub[3]
Methane emission factor for natural gas combustion	EF_{NG,CH_4}	0.001	kg CH_4/mmBTU natural gas	
Nitrous oxide emission factor for natural gas combustion	EF_{NG,N_2O}	0.0001	kg N_2O/mmBTU natural gas	
Global warming potential of carbon dioxide	GWP_{CO_2}	1	N/A	IPCC Fifth Assessment Report[4]
Global warming potential of methane	GWP_{CH_4}	28	N/A	
Global warming potential of nitrous oxide	GWP_{N_2O}	265	N/A	
Conversion factor	10^{-1}	0.1	mmBTU/therm	EPA Emission Factors Hub
Conversion factor	10^{-3}	0.001	MT/kg	EPA Emission Factors Hub
Building type (i.e., residential or nonresidential)	i	Residential Nonresidential[5]	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; therms = thermal unit; mmBTU = metric million British thermal unit; kg = kilograms; N/A = Not Applicable

1. Southern California Gas (SoCalGas) Natural Gas Report provided by the City via email.

2. Environmental Defense Fund User Guide For Natural Gas Leakage Rate Modeling Tool. Available at: https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

3. Environmental Protection Agency (EPA). Emission Factors Hub. April 1, 2022. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

4. Intergovernmental Panel on Climate Change (IPCC). 2014. AR5 Synthesis Report: Climate Change 2014. Available at: https://www.ipcc.ch/report/ar5/syr/

5. Nonresidential includes natural gas use from commercial sources and excludes energy consumption from industrial and sources.

The total natural gas consumption, emissions factors, and GHG emissions associated with community natural gas use is summarized in Table 8 per building type.

Table 8 Community Residential and Nonresidential Natural Gas GHG Emissions Calculations

Building Type	Activity Data [therms]	End-use Leakage [therms]	Adjusted Activity Data [therms]	Emissions Factor [MT CO_2e/therm]	GHG Emissions [MT CO_2e]
Residential	1,870,469	9,352	1,861,117	0.005311	9,885
Nonresidential	1,249,133	6,246	1,242,887	0.005311	6,601

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent

Energy: Natural Gas Methane Leaks

Natural gas methane leaks occur during delivery to the buildings and during associated end-uses in the community. Gas methane leaks from delivery occur in the pipeline distribution system and are, therefore, upstream of the delivery endpoints located in the City and not reflected in the total reported natural gas purchased. While natural gas pipeline distribution leakage is technically outside of the City's jurisdictional boundaries, the leakage is directly impacted by natural gas consumption in the community. As leakage is directly connected to the community's natural gas consumption, it is best practice to include leakage as an emissions sector and it is, therefore, included in the City's 2021 Community GHG Inventory. Methane leaks from end-use discussed previously occur at the point of use in the City and, therefore, occur within the City's jurisdictional boundaries. Though a recommended source of emissions, the Community Protocol does not provide a specific calculation methodology for determining GHG emissions from natural gas leakage. Therefore, emissions from natural gas leaks were calculated using Equation 3.4 which, aligns with energy calculation principles set forth by the Community Protocol and the guidance provided under Community Protocol Section BE.5 Upstream Emissions from Energy Use. Table 9 shows the parameters and data sources associated with Equation 3.4 which were used to quantify GHG emissions from natural gas distribution and end-use leakage.

EQUATION 3.4

NATURAL GAS LEAKAGE SECTOR EMISSIONS

$$CO_2e_{leak,i} = Fuel_{NG,i} \times EF_{NG\ leak} \times (L_{enduse} + L_{dist}) \quad 3.4$$

Table 9 Emissions Parameters and Data Sources – Community Natural Gas Leaks

Definition	Parameter	Value	Unit	Data Source
Annual GHG emissions from natural gas distribution leakage per building type	$CO_2e_{leak,i}$	See Table 10	MT CO_2e/year	Calculated
Natural gas consumed per building type	$Fuel_{NG,i}$	See Table 10	therms/year	SCG Natural Gas Report[1]
Emission factor for natural gas leakage	$EF_{NG\ leak}$	0.053067	MT CO_2e/therm	Calculated[2]
Percent natural gas lost during distribution	L_{dist}	2.3%	Percent	Alvarez, Ramón et al. (2018)[3]
Percent natural gas lost during consumer end-use	L_{enduse}	0.5%	Percent	Environmental Defense Fund[4]
Building type (i.e., residential or nonresidential)	i	Residential Nonresidential[5]	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; therms = thermal unit; N/A = Not Applicable

1. Southern California Gas (SoCalGas) Natural Gas Report provided by the City via email.

2. Emission factor is calculated using the following equation:

$$2.85\ \frac{cubic\ meters}{therm} * 95\%\ methane\ content * 0.7 \frac{kg}{cubic\ meter} * 28\ \frac{CO_2e}{CH_4} * 0.001 \frac{MT}{kg}$$

3. Alvarez, Ramón et al. (2018). Assessment of methane emissions from the U.S. oil and gas supply chain. Science. 361. Accessed at: https://www.science.org/doi/abs/10.1126/science.aar7204

4. Environmental Defense Fund USER GUIDE FOR NATURAL GAS LEAKAGE RATE MODELING TOOL. Accessed at: https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

5. Nonresidential includes natural gas use from commercial sources and excludes energy consumption from industrial and sources.

The total natural gas use and resulting leakage activity data, emissions factors, and GHG emissions per building type is summarized in Table 10.

Table 10 Community Natural Gas Methane Leaks GHG Emissions Calculations

Natural Gas Sector	Provided Activity Data [therms]	Leakage Source	Methane Leakage [therms]	Emissions Factor [MT CO_2e/therm]	GHG Emissions [MT CO_2e]
Residential	1,870,469	Distribution	43,021	0.053067	2,779
		End-use	9,352	0.053067	
Nonresidential	1,249,133	Distribution	28,730	0.053067	1,856
		End-use	6,246	0.053067	

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent

3.2.2 Transportation

Transportation: On-road

On-road vehicles in the community produce GHG emissions from the mobile combustion of fossil fuels (i.e., internal combustion engines) and up-stream from the production of electricity (i.e., to power electric vehicles). GHG emissions from the on-road transportation sector were calculated in accordance with Community Protocol TR.1.A and TR.2. B. The methodology leverages on-road transportation data from CARB's 2021 EMission FACtor (EMFAC2021) model.[9] EMFAC2021 provides data on the county-wide level and does not differentiate data according to cities. This assessment used emissions factors for on-road vehicles per vehicle class from EMFAC2021.

The Community Protocol recommends the use of regional travel demand models to differentiate passenger, commercial, and bus vehicle miles travelled activity data attributed to the community. This assessment utilizes data provided by Iteris, Inc.[10] The study provided by Iteris is based on data pulled from the Southern California Association of Governments (SCAG) Regional Transportation Model,[11] an origin-destination model which generates attributable daily average vehicle miles travelled (VMT) for participating counties and cities in Southern California. The model provides VMT data from trips occurring within City limits (internal-internal), traversing City limits (internal-external), and trips which are entirely outside City limits (external-external). Daily VMT provided by Iteris accounted for 100 percent of internal-internal trips and 50 percent of internal-external and external-internal trips and was annualized[12] to determine 2021 VMT activity data for the City. Equation 3.5 and Table 11 define the equations, parameters, and data sources used to convert resulting VMT activity data to GHG emissions from on-road transportation fuel combustion.

EQUATION 3.5

TR.1.A & TR.2.B ON-ROAD TRANSPORTATION COMBUSTION EMISSIONS

$$CO_2e_{onroad,i} = \left(T_i + \frac{1}{2}T_{O,i} + \frac{1}{2}T_{D,i}\right) \times EF_{auto,i} \quad 3.5$$

[9] California Air and Resources Board. 2023. Emission FACtor (EMFAC2021 v1.0.1) Model. Available at: https://arb.ca.gov/emfac/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

[10] https://www.iteris.com/

[11] https://scag.ca.gov/activity-based-model

[12] Daily VMT is scaled based on a 347 days per year conversion as specified by iteris and the SCAG Regional Transportation Model. The conversion factor accounts for difference between weekend vs weekday transportation activities.

Table 11 Emissions Parameters and Data Sources – Community On-road Transportation

Definition	Parameter	Value	Unit	Data Source
Total annual community on-road GHG emissions per vehicle class	$CO_2e_{Onroad,i}$	See Table 14	MT CO_2e/year	Calculated
VMT occurring within jurisdictional boundaries per vehicle class	T_i	See Table 14	miles	SCAG Regional Transportation Model (Iteris)[1]
VMT originating within and terminating outside of jurisdictional boundaries per vehicle class	$T_{O,i}$	See Table 14	miles	SCAG Regional Transportation Model (Iteris)
VMT originating outside of and terminating within jurisdictional boundaries per vehicle class	$T_{D,i}$	See Table 14	miles	SCAG Regional Transportation Model (Iteris)
Emissions factor for on-road vehicles per vehicle class	$EF_{auto,i}$	See Table 14	MT CO_2e/mile	EMFAC2021 v1.0.1[2]
Vehicle class	i	Passenger Commercial Bus	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; VMT = vehicle miles travelled; NA = Not Applicable

1. Southern California Association of Governments (SCAG) Regional Transportation Model activity data provided by Iteris, Inc. via email on June 26, 2023. Further information regarding the regional transportation model is available at: https://scag.ca.gov/activity-based-model

2. California Air Resources Board (CARB). 2023. EMission FACtor (EMFAC2021 v1.0.1) Model. Available at: https://arb.ca.gov/emfac/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

In addition to mobile combustion emissions accounted under Community Protocol Equations TR.1.A and TR.2.B, GHG emissions from electric vehicles were included in the City's 2021 Community GHG Inventory for more accurate accounting of on-road transportation trends. This was achieved through modifying Equation 3.5 to account for EV modeshare estimates based on total VMT. EMFAC2021 emissions factors attribute GHG emissions to be zero for EV activity, therefore application of the emission factor to total VMT data do not result in double counting of emissions associated with EVs. The equation, parameters, and data sources used to estimate GHG emissions attributable to on-road EV activity is provided in Equation 3.6 and Table 12 below.

EQUATION 3.6

ON-ROAD TRANSPORTATION ELECTRIC VEHICLE EMISSIONS

$$CO_2e_{onroad,EV,i} = \left(T_i + \frac{1}{2}T_{O,i} + \frac{1}{2}T_{D,i}\right) \times EV_{share,i} \times EPM_i \times EF_{elec,j} \quad 3.6$$

Table 12 Emissions Parameters and Data Sources – Community On-road Transportation EV

Definition	Parameter	Value	Unit	Data Source
Total annual community on-road EV GHG emissions per vehicle class	$CO_2e_{Onroad,EV,i}$	See Table 14	MT CO_2e/year	Calculated
VMT occurring within jurisdictional boundaries per vehicle class	T_i	See Table 13	miles	SCAG Regional Transportation Model (Iteris)[1]
VMT originating within and terminating outside of jurisdictional boundaries per vehicle class	$T_{O,i}$	See Table 13	miles	SCAG Regional Transportation Model (Iteris)
Vehicle miles travelled originating outside of and terminating within jurisdictional boundaries per vehicle class	$T_{D,i}$	See Table 13	miles	SCAG Regional Transportation Model (Iteris)
Percent share of VMT attributable to EVs	$EV_{share,i}$	See Table 13	%	EMFAC2021 v1.0.1[2]
Average rate of electricity consumption per EV-mile per vehicle class	EPM_i	See Table 13	kWh/mile	EMFAC2021 v1.0.1
Weighted average electricity emissions factor per building type	$EF_{elec,j}$	See Table 13	MT CO_2e/kWh	SCE 2021 Power Content Label[3]
Vehicle class	i	Passenger Commercial Bus	Categorical	N/A
Building type	j	Residential Nonresidential	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; EV = electric vehicles; VMT = vehicle miles travelled; kWh = kilowatt hour; N/A = Not Applicable

1. SCAG Regional Transportation Model activity data provided by Iteris, Inc. via email on June 26, 2023. Further information regarding the regional transportation model is available at: https://scag.ca.gov/activity-based-model

2. California Air Resources Board (CARB). 2023. EMission FACtor (EMFAC2021 v1.0.1) Model. Available at: https://arb.ca.gov/emfac/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

3. California Energy Commission. 2023. 2021 Power Content Label submitted by Southern California Edison. Available at: https://www.energy.ca.gov/filebrowser/download/4676

Table 13 shows the VMT activity data for community vehicles per vehicle class as well as the EV share of VMT and EVMT used to determine EV activity data expressed as electricity consumption.

Table 13 Community On-road EV Activity Data Calculations

Vehicle Class	VMT Activity Data [miles]	EV Share [%]	EVMT [miles]	EPM [kWh/mile]	EV Activity Data [kWh]
Passenger	156,825,956	2.54%	3,983,379	0.36	1,446,819
Commercial	10,326,720	0.00%	0	0	0
Bus	262,208	0.51%	1,337	2.11	2,825

Notes: VMT = vehicle miles travelled; EV = electric vehicle; EPM = electricity per mile; EVMT = electric vehicle miles traveled; kWh = kilowatt hour

The activity data, emissions factors, and resulting GHG emissions from on-road transportation quantified in accordance with Equation 3.5 and Equation 3.6 are summarized in Table 14 below.

Table 14 Community On-road Transportation GHG Emissions Calculations

Sector	Activity Data[1]		Emission Factor		GHG Emissions [MT CO_2e]
Passenger VMT	156,825,956	VMT	0.000354	MT CO_2e/mile	55,516
Commercial VMT	10,326,720	VMT	0.001198	MT CO_2e/mile	12,371
Bus VMT	262,208	VMT	0.002123	MT CO_2e/mile	557
Passenger EVMT[1]	1,446,819	kWh	0.000263	MT CO_2e/mile	381
Commercial EVMT[2]	0	kWh	0.000263	MT CO_2e/mile	0
Bus EVMT[2]	2,825	kWh	0.000263	MT CO_2e/mile	1
Total					**68,826**

Notes: VMT = vehicle miles traveled; EVMT = electric vehicle miles traveled; kWh = kilowatt hour; MT CO_2e = Metric tons of carbon dioxide equivalent

1. EV activity data does not include kWh associated with T&D losses as these emissions are considered negligible and are included under energy sector emissions.

2. Emissions factor for on-road passenger EV electricity use is weighted according to the portion of electricity supplied per provider in the residential electricity sector (see Table 4)

3. Emissions factor for on-road commercial and bus EV electricity use is weighted according to the portion of electricity supplied per provider in the residential electricity sector (see Table 4)

Transportation: Off-road

Off-road equipment and vehicles in the community generate GHG emissions from the mobile combustion of fossil fuels. Off-road fuel usage results from equipment operation for sectors such as agricultural, construction, lawn and garden, and recreational equipment. Community Protocol Equation TR.8 was used to quantify GHG emissions from off-road equipment fuel consumption and is shown under Equation 3.7 below. Table 15 lists the parameters, values, and data sources used to quantify emissions in according with the Community Protocol.

EQUATION 3.7

TR.8 OFF-ROAD EQUIPMENT SECTOR EMISSIONS

$$CO_2e_{offroad,j} = EF_j \times \sum_i Fuel_{offroad,i,j} \times AF_i \quad 3.7$$

Table 15 Emissions Parameters and Data Sources – Community Off-Road Equipment

Definition	Parameter	Value	Unit	Data Source
Annual GHG emissions from offroad equipment	$CO_2e_{offroad,j}$	See Table 17	MT CO_2e/year	Calculated
Annual fuel consumption in the County per sector per fuel type	$Fuel_{offroad,i,j}$	See Table 17	Gallons/year	OFFROAD2021[1]
Fuel attribution factor per equipment type	AF_i	See Table 16	Percent	SCAG Growth Forecast[2]
Emission factor per fuel type	EF_j	See Table 17	MT CO_2e/gallon	EPA Emission Factors Hub[3]
Equipment Type	i	See Table 16	Categorical	OFFROAD2021
Fuel type	j	Gasoline Diesel Natural Gas	Categorical	OFFROAD2021

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent

1. California Air Resource Board (CARB). 2023. Mobile Source Emissions Inventory Off-road (OFFROAD2021 v1.0.3). Available at: https://arb.ca.gov/emfac/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

2. Southern California Association of Governments (SCAG). 2023. 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction. Available at: https://scag.ca.gov/sites/main/files/file-attachments/2016_2040rtpscs_finalgrowthforecastbyjurisdiction.pdf?1605576071

3. Environmental Protection Agency (EPA). 2022. GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

Locally applicable activity data in alignment with ICLEI protocol standards reports off-road equipment fuel consumption on a county-wide basis. Attribution factors per equipment type used to allocate City off-road fuel usage were determined based on demographic data and land use data relating to population size, number of jobs, and agricultural acreage, where applicable. The demographic attribution metrics and percent attribution used for each off-road equipment type is shown in Table 16.

Table 16 Community Off-road Equipment Sector Attributions

Equipment Type	Attribution Metric	Attribution	Data Source
Agricultural	Excluded – Other[1]	0.00%	N/A
Airport Ground Support	Excluded – Not Under Jurisdictional Control	0.00%	N/A
Cargo Handling Equipment	Excluded – Not Under Jurisdictional Control	0.00%	N/A
Commercial Harbor Craft	Excluded – Not Under Jurisdictional Control	0.00%	N/A
Construction and Mining	Employment	0.25%	SCAG Growth Forecast[2]
Industrial	Employment	0.25%	SCAG Growth Forecast
Lawn and Garden	Population	0.24%	SCAG Growth Forecast
Light Commercial	Employment	0.25%	SCAG Growth Forecast
Locomotive	Excluded – Not Under Jurisdictional Control	0.00%	N/A
Ocean Going Vessel	Excluded – Not Under Jurisdictional Control	0.00%	N/A
Oil Drilling	Excluded – Not Under Jurisdictional Control	0.00%	N/A

Equipment Type	Attribution Metric	Attribution	Data Source
Outboard Marine Tanks	Excluded – Not Under Jurisdictional Control	0.00%	N/A
Pleasure Craft	Population	0.24%	SCAG Growth Forecast
Portable Equipment	Employment	0.25%	SCAG Growth Forecast
Transport Refrigeration Unit	Employment	0.25%	SCAG Growth Forecast
Recreational	Population	0.24%	SCAG Growth Forecast
Military Tactical Support	Excluded – Not Under Jurisdictional Control	0.00%	N/A
Forestry	Excluded – Other[3]	0.00%	N/A

Notes: N/A = Not Applicable

1. Agricultural off-road equipment was excluded to remain consistent with the scope of the City's 2021 Community Inventory which excludes agricultural electricity and natural gas sector GHG emissions due to aggregation rules.

2. Southern California Association of Governments. 2023. 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction. Available at: https://scag.ca.gov/sites/main/files/file-attachments/2016_2040rtpscs_finalgrowthforecastbyjurisdiction.pdf?1605576071

3. Though forestry occurs withing the County of Los Angeles, there appears to be minimal opportunity for forestry within the City's boundaries. Therefore, it is assumed that offroad fuel consumption for forestry activities is negligible and thereby excluded.

The allocated and aggregated activity data by fuel type, emission factors, and emissions results for the inventory's off-road equipment sector are provided in Table 17.

Table 17 Community Off-road GHG Emissions Calculations

Fuel Type	Activity Data (gallons)	Emission Factor (MT CO_2e/gallon)[1]	GHG Emissions (MT CO_2e)
Diesel	208,532	0.008542	1,781
Gasoline	224,366	0.009186	2,061
Natural Gas	135,042	0.005863	792
Total			**4,634**

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; Values may not add due to rounding

1. Emission factors per fuel type represent a weighted average based on the emissions factor and fuel consumption per offroad equipment type as determined according to EPA's Emissions Factor Hub available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

3.2.3 Solid Waste

GHG emissions associated with the waste sector result from the decomposition of waste at a landfill as well as landfill operation processes. City solid waste is collected by Republic Services and transported to the Antelope Valley Public Landfill, Azusa Land Reclamation Company Landfill, Chiquita Canyon Sanitary Landfill, El Sobrante Landfill, Frank R Bowerman Sanitary Landfill, Olinda Alpha Landfill, Simi Valley Landfill and Recycling Center, and/or the Sunshine Canyon City/County Landfill[13].. GHG emissions from waste decomposition were calculated using Community Protocol Method SW.4. Equation 3.8 and Table 18 provide the calculation method, associated parameters, and data sources used to quantify GHG emissions in accordance with Community Protocol SW.4.

[13] CalRecycle. 2023. Jurisdiction Disposal and Alternative Daily Cover Tons by Facility. Accessed at https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility

EQUATION 3.8

SW.4.1 SOLID WASTE FUGITIVE EMISSIONS

$$CO_2e_{Waste,fugitive} = GWP_{CH_4} \times (1 - CE) \times (1 - OX) \times M \times \sum_i P_i \times EF_i \quad 3.8$$

Table 18 Emissions Parameters and Data Sources – Community Solid Waste

Definition	Parameter	Value	Unit	Data Source
Annual community generated waste GHG emissions	$CO_2e_{Waste,fugitive}$	See Table 19	MT CO_2e/year	Calculated
Methane global warming potential	GWP_{CH_4}	28	N/A	IPCC Fifth Assessment Report[1]
Default LFG collection efficiency	CE	0.75	Fraction	ICLEI Community Protocol
Oxidation rate	OX	0.10	Fraction	ICLEI Community Protocol
Total mass of waste entering landfill	M	22,127	Wet short tons	City of San Fernando[2]
Proportion of total waste material per material type	P_i	1	Fraction	ICLEI Community Protocol
Emission factor per material type[3]	EF_i	0.52	MT CO_2/ short ton material	US EPA Emission Factors for Greenhouse Gas Inventories l
Material type	i	Multiple	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; N/A = Not Applicable

1. Intergovernmental Panel on Climate Change (IPCC). 2014. AR5 Synthesis Report: Climate Change 2014. Available at: https://www.ipcc.ch/report/ar5/syr/

2. Tons of waste activity data provided by the City of San Fernado via email.

Although the landfill is not located within the City boundaries, landfill process emissions are attributable to the City and were quantified according to Equation SW.5 of the Community Protocol. Equation 3.9 and Table 19 provide the calculation method, associated parameters, and data sources used to quantify GHG emissions from landfill operations.

EQUATION 3.9

SW.5 SOLID WASTE PROCESS EMISSIONS

$$CO_2e_{Waste,process} = M \times EF_p \quad 3.10$$

Table 19 Emissions Parameters and Data Sources – Community Solid Waste

Definition	Parameter	Value	Unit	Data Source
Annual landfill process GHG emissions	$CO_2e_{Waste,process}$	243	MT CO_2e/year	Calculated
Total mass of solid waste that enters the landfill in the inventory year	M	22,127	Wet short tons/year	City of San Fernando[1]
Emissions factor for landfill process emissions	EF_p	0.011	MT CO_2e/wet short ton	ICLEI Community Protocol

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent

1. Tons of waste activity data provided by the City of San Fernando via email

The total GHG emissions from solid waste sources are summarized in Table 20.

Table 20 Community Solid Waste Tonnage Allocation

Emissions Source	GHG Emissions [MT CO_2e/year]
Landfill Fugitive Emissions	11,506
Landfill Process Emissions[1]	243
Total	**11,749**

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent

3.2.4 Water

Water consumption generates GHG emissions from the electricity used to deliver water to the community, as well as the energy used to treat and convey the water prior to delivery. In San Fernando, 100 percent of the City's source water is local groundwater pumped by the City and sourced from groundwater wells located along the Sylmar Groundwater Basin. The City only uses the Metropolitan Water District of Southern California's connections for emergency use. Emissions from electricity used for City-supplied water are anticipated to be accounted for under the municipal electricity sector and are, therefore, excluded from the community inventory to avoid double counting. However, GHG emissions associated with City water production are quantified and presented below for information purposes. Table 21 shows the parameters and data sources associated with Equation 3.11 which were used to quantify GHG emissions from local water sources.

EQUATION 3.11

WW.14 WATER SECTOR EMISSIONS

$$CO_2e_{Water,i} = Vol_i \times \sum_j EI_{i,j} \times EF_{elec,i,j} \quad 3.11$$

Table 21 Emissions Parameters and Data Sources – Community Water

Definition	Parameter	Value	Unit	Data Source
Annual GHG emissions from water consumption per water district	$CO_2e_{Water,i}$	See Table 22	MT CO_2e/year	Calculated
Volume of water supplied to the community per water district	Vol_i	See **Error! Reference source not found.**	AF	2021 Water Production Report[1]
Energy intensity of water distribution per water district	$EI_{i,j}$	See Table 22	kWh/AF	City of San Fernando 2020 UWMP[2]
Electricity emissions factor per water process stage per source type	$EF_{elec,i,j}$	See Table 22	MT CO_2e/kWh	1. SCE 2021 Power Content Label[3] 2. EPA eGRID[4]
Water district	i	See Table 22 **Error! Reference source not found.**	Categorical	N/A

Definition	Parameter	Value	Unit	Data Source
Water process stage	*j*	Extraction Conveyance Treatment Distribution	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; AF = acre-feet; kWh = kilowatt hour; UWMP = Urban Water Management Plan; N/A = Not Applicable

1. Acre-feet of water production provided by the City of San Fernado via email.

2. City of San Fernando. 2020. Urban Water Management Plan. Available at: https://ci.san-fernando.ca.us/wp-content/uploads/2021/06/San-Fernando_2020-UWMP_Public-Draft_2021-06-02.pdf

3. California Energy Commission. 2023. 2021 Power Content Label submitted by Southern California Edison. Available at: https://www.energy.ca.gov/filebrowser/download/4676

4. Environmental Protection Agency (EPA). 2023. eGRID Data Explorer 2021 Western Energy Grid. Available at: https://www.epa.gov/egrid/data-explorer

Error! Reference source not found. shows the total water supplied to the City, the energy intensity, emissions factor, and total emissions.

Table 22 Community Water Activity Data, Energy Intensity, Emission Factor, and Emissions Per Water Provider

Water District	Activity Data [AF]	Energy Intensity (kWh/AF)	Emissions Factor [MT CO_2e/kWh]	Emission [MT CO_2e/year]
Local Water Supply				
City of San Fernando[1]	2,763.61	2,421.2[1]	0.000263[2]	1,760[3]

Notes: kWh = kilowatt hour; AF = acre-feet

1. Energy Intensity information for the City of San Fernando was sourced from the City's 2020 Urban Water Management Plan available at: https://ci.san-fernando.ca.us/wp-content/uploads/2021/06/San-Fernando_2020-UWMP_Public-Draft_2021-06-02.pdf

2. Emissions factors are sourced from the City's electricity provider (SCE) power label information available at: https://www.energy.ca.gov/filebrowser/download/4676

3. To limit double counting, emissions are not included in the 2021 Community inventory.

3.2.5 Wastewater

Management of wastewater produces emissions through every stage of the process from collection to final use or discharge. The City's wastewater is treated by the Sanitation Districts of Los Angeles County (LACSD) and is not processed or disposed of within the City's boundaries. The City's wastewater is sent to Hyperion Water Reclamation Plan (Hyperion WRP). LACSD estimates approximately 69 gallons per person per day of wastewater is generated within LACSD's service area.

Hyperion WRP utilizes a primary and secondary treatment process using digester tanks to treat wastewater for reclamation purposes or discharge to the Santa Monica Bay. Currently, Hyperion WRP processes an average of 260 million gallons (MG) per day with approximately 220 MG being discharged into the sea.[14]

GHG emissions from Hyperion WRP operations are a result of stationary combustion, process emissions, effluent discharge into the Pacific Ocean, and electricity use. Community protocol

[14] City of Los Angeles Sanitation. 2023. Hyperion Reclamation Plant. Available at: https://www.lacitysan.org/san/faces/home/portal/s-lsh-wwd/s-lsh-wwd-cw/s-lsh-wwd-cw-p/s-lsh-wwd-cw-p-hwrp?_adf.ctrl-state=t7b1utnjj_752&_afrLoop=1285933100222320#!

methods used to quantify GHG emissions from stationary combustion, process emissions, effluent discharge, and electricity use rely on population served by the wastewater facility as activity data.

The set of methods used to quantify stationary combustion emissions is outlined in Equation 3.12 and Table 23 as well as Equation 3.13 and Table 24 below.

EQUATION 3.12

WW.1. (ALT) WASTEWATER DIGESTER GAS STATIONARY COMBUSTION EMISSIONS (CH_4)

$$CO_2e_{WW,Stat,CH4,i} = (P_i \times Digester\ Gas \times f_{CH4} \times BTU_{CH4} \times 10^{-6} \times EF_{CH4} \times 365.25 \times 10^{-3}) \times GWP_{CH4} \quad 3.12$$

Table 23 Emissions Parameters and Data Sources – Community Wastewater WW.1. (alt)

Definition	Parameter	Value	Unit	Data Source
Total annual GHG emitted by devices designed to combust digester gas	$CO_2e_{WW,Stat,CH4}$	See Table 28	MT CO_2e/year	Calculated
Population served[1]	P_i	36,640	People	SCAG Growth Forecast[2]
Rate of digester gas volume production	$Digester\ Gas$	1.00	std ft^3/person/day	ICLEI Community Protocol
Fraction of methane in digester gas	f_{CH4}	0.65	Fraction	ICLEI Community Protocol
Default higher heating value of methane	BTU_{CH4}	1,028	BTU/ft^3	ICLEI Community Protocol
Conversion factor	10^{-6}	0.000001	mmBTU/BTU	EPA Emission Factors Hub
Methane emissions factor	EF_{CH4}	0.0032	kg CH_4/mmBTU	ICLEI Community Protocol
Conversion factor	365.25	365.25	Days/year	ICLEI Community Protocol
Conversion factor	10^{-3}	0.001	MT/kg	EPA Emission Factors Hub
Global warming potential of methane	GWP_{CH4}	25	N/A	IPCC Fifth Assessment Report
WRP	i	Hyperion WRP	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; std ft^3 = standard cubic feet; BTU = British thermal unit; mmBTU = one million British thermal units; kg = kilograms N/A = Not Applicable

1. Population serviced (or service population) is the sum of population and employment.

2. Southern California Association of Governments. 2023. 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction. Available at: https://scag.ca.gov/sites/main/files/file-attachments/2016_2040rtpscs_finalgrowthforecastbyjurisdiction.pdf?1605576071

EQUATION 3.13

WW.2. (ALT) WASTEWATER DIGESTER GAS STATIONARY COMBUSTION EMISSIONS (N_2O)

$$CO_2e_{WW,Stat,N2O,i} = (P_i \times Digester\ Gas \times f_{CH4} \times BTU_{CH4} \times 10^{-6} \times EF_{N2O} \times 365.25 \times 10^{-3}) \times GWP_{N2O} \quad 3.13$$

Table 24 Emissions Parameters and Data Sources – Community Wastewater WW.2. (alt)

Definition	Parameter	Value	Unit	Data Source
Total annual GHG emitted by devices designed to combust digester gas	$CO_2e_{WW,Stat,N2O}$	See Table 28	MT CO_2e/year	Calculated
Population served[1]	P_i	36,640	People	SCAG Growth Forecast[2]
Rate of digester gas volume production	$Digester\ Gas$	1.00	std ft^3/person/day	ICLEI Community Protocol
Fraction of methane in digester gas	f_{CH4}	0.65	Fraction	ICLEI Community Protocol
Default higher heating value of methane	BTU_{CH4}	1,028	BTU/ft^3	ICLEI Community Protocol
Conversion factor	10^{-6}	0.000001	mmBTU/BTU	EPA Emission Factors Hub
Nitrous Oxide emissions factor	EF_{N2O}	0.0006	kg N_2O/mmBTU	ICLEI Community Protocol
Conversion factor	365.25	365.25	Days/year	ICLEI Community Protocol
Conversion factor	10^{-3}	0.001	MT/kg	EPA Emission Factors Hub
Global warming potential of nitrous oxide	GWP_{N2O}	265		IPCC Fifth Assessment Report
WRP	i	Hyperion WRP	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; std ft^3 = standard cubic feet; BTU = British thermal unit; mmBTU = one million British thermal units; kg = kilograms N/A = Not Applicable

1. Population serviced (or service population) is the sum of population and employment

2. Southern California Association of Governments. 2023. 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction. Available at: https://scag.ca.gov/sites/main/files/file-attachments/2016_2040rtpscs_finalgrowthforecastbyjurisdiction.pdf?1605576071

Equation 3.14 shows the calculation method use to quantify process emissions without nitrification/denitrification in accordance with Community Protocol WW.8. Table 25 show the parameter definitions, default factors, and data sources used.

EQUATION 3.14

WW.8 CENTRALIZED WWTP W/O NITRIFICATION/DENITRIFICATION

$$CO_2e_{WW,w/o\ nit/denit,i} = P_i \times F_{ind-com} \times EF_{w/o\ nit/denit} \times 10^{-6} \times GWP_{N2O} \quad 3.14$$

Table 25 Emissions Parameters and Data Sources – Community Wastewater WW.8

Definition	Parameter	Value	Unit	Data Source
Total annual GHG emitted by WWTP processes	$CO_2e_{WW,w/o\ nit/denit,i}$	See Table 28	MT CO_2e/year	Calculated
Population served[1]	P_i	36,640	People	SCAG Growth Forecast[2]
Factor for insignificant industrial or commercial discharge	$F_{ind-com}$	1.00	N/A	ICLEI Community Protocol
Emissions factor for a WWTP without	$EF_{w/o\ nit/denit}$	3.20	g N_2O/person/year	ICLEI Community Protocol

Definition	Parameter	Value	Unit	Data Source
nitrification or denitrification				
Conversion factor	10^{-6}	0.000001	MMBtu/BTU	EPA Emission Factors Hub
Global warming potential of nitrous oxide	GWP_{N20}	265	N/A	IPCC Fifth Assessment Report
WRP	i	Hyperion WRP	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; std ft^3 = standard cubic feet; BTU = British thermal unit; MMBtu = one million British thermal units; kg = kilograms N/A = Not Applicable

1. Population serviced (or service population) is the sum of population and employment

2. Southern California Association of Governments. 2023. 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction. Available at: https://scag.ca.gov/sites/main/files/file-attachments/2016_2040rtpscs_finalgrowthforecastbyjurisdiction.pdf?1605576071

Community Protocol Equation WW.12.(alt) was used to quantify GHG emissions associated with treated wastewater effluent discharge into natural water bodies. Equation 3.15 shows the calculation method use to quantify process emissions without nitrification/denitrification in accordance with the Community Protocol, while Table 26 shows the parameter definitions, default factors, and data sources used.

EQUATION 3.15

WW.12. (ALT) NITROUS OXIDE EMISSIONS FROM EFFLUENT DISCHARGE

$$CO_2e_{WW,effluent,i} = P_i \times F_{ind-com} \times (Total\ N\ Load - N\ Uptake_i \times BOD_5\ load) \times EF_{effluent,i} \times \frac{44}{28} \times \left(1 - F_{plant,i}\right) \times 365.25 \times 10^{-3} \times GWP_{N2O} \quad 3.15$$

Table 26 Emissions Parameters and Data Sources – Community Wastewater WW.12. (alt)

Definition	Parameter	Value	Unit	Data Source
Total annual GHG emitted by WWTP processes	$CO_2e_{WW,w/o\ nit/denit,i}$	See Table 28	MT CO_2e/year	Calculated
Population served[1]	P_i	36,640	People	1. SCAG Growth Forecast[2]
Factor for industrial or commercial discharge	$F_{ind-com}$	1.00	N/A	ICLEI Community Protocol
Average total nitrogen per day	$Total\ N\ Load$	0.026	kg N/person/day	ICLEI Community Protocol
Nitrogen uptake for cell growth per system type (aerobic vs anaerobic)	$N\ Uptake_i$	0.005	kg N/kg BOD_5	ICLEI Community Protocol
Rate of BOD_5 produced	$BOD5\ load$	0.09	kg BOD_5/person/day	ICLEI Community Protocol
Emissions factor of discharge to water body type (ocean)	$EF_{effluent,i}$	0.003	kg N_2O-N/kg sewage-N discharged	ICLEI Community Protocol
Molecular weight ratio of N_2O to N_2	$\frac{44}{28}$	1.57	Fraction	ICLEI Community Protocol
Fraction of nitrogen removed from the WWTP per system type (w/ or w/o nit/denit)	$F_{plant,i}$	0.00	Fraction	ICLEI Community Protocol
Conversion factor	365.25	365.25	Days/year	ICLEI Community Protocol
Conversion factor	10^{-3}	0.001	MT/kg	EPA Emission Factors Hub
Global warming potential of nitrous oxide	GWP_{N2O}	265	N/A	IPCC Fifth Assessment Report
WRP	i	Hyperion WRP	Categorical	N/A

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; std ft^3 = standard cubic feet; kg = kilograms; BOD_5 = five-day biochemical oxygen demand; N/A = Not Applicable

1. Population serviced (or service population) is the sum of population and employment

2. Southern California Association of Governments. 2023. 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction. Available at: https://scag.ca.gov/sites/main/files/file-attachments/2016_2040rtpscs_finalgrowthforecastbyjurisdiction.pdf?1605576071

Electricity use is required for the collection and treatment of wastewater. Electricity use from City wastewater treatment at Hyperion WRP were quantified in alignment with Community Protocol Equation WW.15. Equation **3.16**and Table 27 outline the method, parameters, and data sources used to determine GHG emissions attributable to San Fernando's fair share of electricity use at the wastewater facility.

EQUATION 3.16

WW.15 ENERGY-RELATED EMISSIONS ASSOCIATED WITH WASTEWATER COLLECTION AND TREATMENT

$$CO_2e_{WWelec,i} = Elec_{WW,i} \times Per_{vol} \times EF_{elec,i} \quad 3.16$$

Table 27 Emissions Parameters and Data Sources – Community Wastewater WW.15

Definition	Parameter	Value	Unit	Data Source
Total annual GHG emitted by WWTP electricity use	$CO_2e_{WWelec,i}$	See Table 28	MT CO_2e/year	Calculated
Energy intensity per WWTP and wastewater management stage	$EI_{WW,i,j}$	2,080	kWh/MG	ICLEI Community Protocol
Volume of community wastewater production	Vol_i	711.54	MG	2021 San Fernando Wastewater Production Total.
Electricity emission factor per WWTP	$EF_{elec,i}$	0.000242	MT CO_2e/kWh	EPA eGRID[1]
Wastewater treatment plant or (WWTP)	i	Hyperion WRP	Categorical	N/AXXX

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; MG = million gallons; AF = acre-feet; kWh = kilowatt hour; N/A = Not Applicable

1. Environmental Protection Agency (EPA). 2023. eGRID Data Explorer 2021 Western Energy Grid. Available at: https://www.epa.gov/egrid/data-explorer

Table 28 summarizes the City's wastewater sector activity data, emissions factors, and GHG emissions per WRP.

Table 28 Community Wastewater GHG Emissions Calculations

Emissions Source	Protocol Equation	Activity Data		Emissions Factor[1]		GHG Emissions [MT CO_2e/year]
Hyperion WRP						
Stationary Combustion	WW.1. (alt) WW.2. (alt)	36,649	people	0.0000626	MT CO_2e/person	2.29
Process N_2O	WW.8	36,649	people	0.0008480	MT CO_2e/person	31.07
Effluent Discharge	WW.12. (alt)	36,649	people	0.0097066	MT CO_2e/person	355.65
Electricity Use	WW.15	1,480,005	kWh	0.0002421	MT CO_2e/kWh	358.28
Electricity Use T&D	WW.15	65,120	kWh	0.0002421	MT CO_2e/kWh	15.76
Total						**763.06**

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; kWh = kilowatt hour

3.3 2021 Community GHG Emissions Inventory Results

The inventory provides the City with current GHG emissions estimates that follow the Community Protocol and current best practices for GHG accounting. The results of the GHG inventory are summarized in Figure 1 and shown in detail in Table 29. San Fernando's total community GHG emissions in 2021 is 138,990 MT CO_2e. On-road transportation (50 percent) and building energy (38 percent) accounted for the first and second largest amount of GHG emissions in San Fernando in 2021. Solid waste accounts for 8 percent of total emissions while off-road equipment and wastewater account for 3 percent and 0.5 percent, respectively.

Figure 1 Community Inventory GHG Emissions by Sector

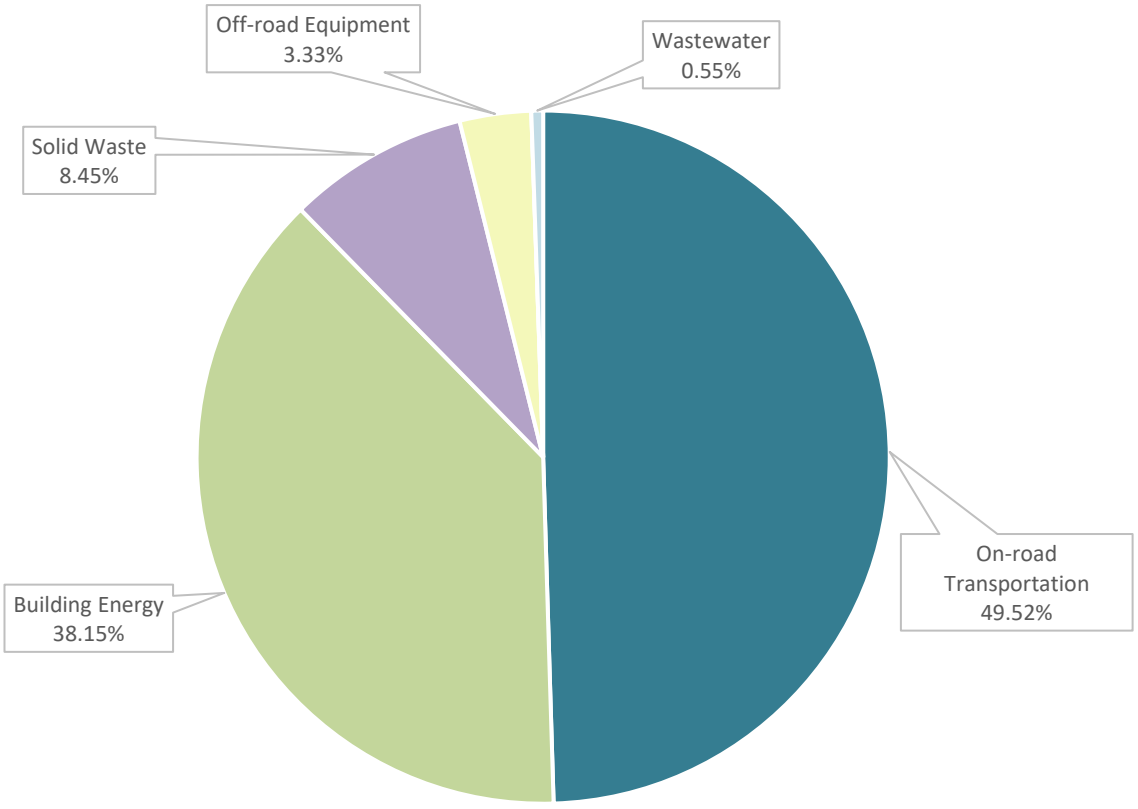

Table 29 Community GHG Emissions Inventory

GHG Emissions Sector	GHG Emissions Subsector	Activity Data		Emission Factor		GHG Emissions (MT CO_2e)
Energy	Residential Electricity	37,300,732	kWh	0.000263	MT CO_2e/kWh	9,813
	Residential Electricity T&D	1,704,892	kWh	0.000263	MT CO_2e/kWh	449
	Nonresidential Electricity	78,767,388	kWh	0.000263	MT CO_2e/kWh	20,722
	Nonresidential Electricity T&D	3,465,889	kWh	0.000263	MT CO_2e/kWh	912
	Residential Natural Gas	1,861,117	therms	0.005311	MT CO_2e/therm	9,885
	Residential Natural Gas Leaks	52,373	therms	0.053067	MT CO_2e/therm	2,779
	Nonresidential Natural Gas	1,242,887	therms	0.005311	MT CO_2e/therm	6,601
	Nonresidential Natural Gas Leaks	34,976	therms	0.053067	MT CO_2e/therm	1,856
Transportation	Passenger VMT	156,825,956	VMT	0.000354	MT CO_2e/mile	55,516
	Commercial VMT	10,326,720	VMT	0.001198	MT CO_2e /mile	12,371
	Bus VMT	262,208	VMT	0.002123	MT CO_2e /mile	557
	Passenger EVMT	1,446,819	kWh	0.000263	MT CO_2e /kWh	381
	Commercial EVMT	0	kWh	0.000263	MT CO_2e /kWh	0
	Bus EVMT	2,825	kWh	0.000263	MT CO_2e /kWh	1
	Off Road-Diesel	208,532	Gallons	0.008542	MT CO_2e /Gallon	1,781
	Off Road-Gasoline	224,366	Gallons	0.009186	MT CO_2e /Gallon	2,061
	Off Road-Natural Gas	135,042	Gallons	0.005863	MT CO_2e /Gallon	792
Solid Waste	Landfill Methane	22,127	tons	0.52	MT CO_2e /ton	11,506
	Process Emissions	22,127	tons	0.011000	MT CO_2e /ton	243
Water	Local	-	kWh	-	MT CO_2e /kWh	-
	Imported	-	kWh	-	MT CO_2e /kWh	-
Wastewater	Stationary Combustion	36,640	persons	0.000063	MT CO_2e /person	2
	Process N_2O Emissions	36,640	persons	0.000848	MT CO_2e /person	31
	Effluent Discharge Fugitive N_2O	36,640	persons	0.009707	MT CO_2e /person	356
	Electricity Use	1,480,005	kWh	0.000242	MT CO_2e /kWh	358
	Electricity Use T&D	65,120	kWh	0.000242	MT CO_2e /kWh	156
Total						**138,990**

Notes: VMT = vehicle miles traveled; EVMT = electric vehicle miles traveled; kWh = kilowatt hour; MT CO_2e = Metric tons of carbon dioxide equivalent; gal = gallons

4 GHG Emissions Inventory – Municipal

4.1 Methodology

The City's municipal GHG inventory (2021 Municipal Inventory) was competed using the Local Government Operations Protocol (LGOP)[15] developed by ICLEI, CARB, California Climate Action Registry, and The Climate Registry (TCR). The LGOP methodology includes the calculation of GHG emissions which can be attributed directly to the City's operations in the given inventory year. The Municipal Inventory allows the City to track its GHG emissions resulting from the municipally owned facilities, vehicles, and equipment over which it can exert control with GHG reduction policies and ultimately lead by example.

The results of GHG emission calculations are presented by emissions scope, relating to the degree of control the City has over emissions sources, and the specific sources that the emissions are associated with. Emissions sources are categorized as direct (i.e., Scope 1) or indirect (i.e., Scope 2 or Scope 3), in accordance with the World Resources Institute and the World Business Council for Sustainable Development's Greenhouse Gas Protocol Corporate Standard, which are summarized below:

- **Scope 1:** Direct GHG emissions from sources within a local government's operations that it owns and/or controls. This includes stationary combustion to produce electricity, steam, heat, and power equipment; mobile combustion of fuels; process emissions from physical or chemical processing; fugitive emissions that result from production, processing, transmission, storage, and use of fuels; and other sources.
- **Scope 2:** Indirect GHG emissions associated with the consumption of electricity, steam, heating, or cooling that are purchased from a utility provider that also provides energy to other jurisdictions and/or is located outside City boundaries.
- **Scope 3**: All other indirect GHG emissions not covered in Scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the City (e.g., employee commuting and business travel, outsourced activities, waste disposal, etc.).

Scope

Similar to the community inventory, the GHG emissions sources and sectors for the municipal operations inventory are categorized into various sectors and subsectors to match the GHG emissions reporting of the community GHG emissions inventory, with the granularity required by the LGOP. The primary sectors of GHG emissions sources include:

- Electricity
- Natural Gas
- Transportation
- Water and Wastewater
- Solid Waste

[15] ICLEI. May 2010. Local Government Operations Protocol for the quantification and reporting of greenhouse gas emissions inventories.

Further granularity can be achieved by also reporting GHG emissions sources by the following subsectors when possible: [16]

- Buildings and other facilities
- Streetlights and traffic signals
- Water delivery facilities
- Vehicle fleet
- Transit fleet
- Wastewater facilities
- Employee commute
- Water consumption
- Solid waste generation

The City's 2021 Municipal Inventory includes an assessment of the City's operational GHG emissions according to the above subsectors, as possible, and categorized to reflect the City's municipal Scope 1-3 emissions.[17]

Emissions Boundary

The 2021 Municipal Inventory includes all emissions occurring within the City's direct jurisdictional authority (i.e., sources of emissions resulting from facilities that the City owns and/or operates).

4.2 2021 Municipal GHG Emissions Inventory

4.2.1 Buildings and Other Facilities

Buildings and facilities generate Scope 1 and Scope 2 emissions that relate to the stationary combustion of natural gas (i.e., Scope 1) and the use of electricity (i.e., Scope 2) in the City's facilities.

Natural gas, which is used for heating and cooling buildings and facilities is provided to the City by SoCalGas. However, similar to the community natural gas used, not all the natural gas used is combusted. It's estimated that 2.3 percent of natural gas is leaked through the distribution pipelines,[18] while about 0.5 percent of the natural gas delivered is leaked at end-uses and not combusted.[19] The activity data provided by SoCalGas is adjusted to remove end-use leakage and an emission factor from the EPA Emission Factors for Greenhouse Gas Inventories report is applied to calculate GHG emissions from natural gas combustion.[20] Emissions from distribution and end-use methane leaks are calculated separately using the adjusted activity data and a calculated natural gas

[16] The LGO Protocol recommends additional subsector reporting; however, the following have been excluded due to inapplicability to the City of San Fernando's operations: port facilities, airport facilities, solid waste facilities, and employee business travel.

[17] The 2021 Municipal Inventory does not include a subsector for streetlight and traffic signals as data was provided aggregated and could not be parsed out.

[18] Alvarez, Ramón et al. (2018). Assessment of methane emissions from the U.S. oil and gas supply chain. Science. 361. https://www.science.org/doi/abs/10.1126/science.aar7204

[19] Environmental Defense Fund USER GUIDE FOR NATURAL GAS LEAKAGE RATE MODELING TOOL. Available at: https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

[20] Environmental Protection Agency (EPA). 2022. GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

methane leak emission factor. The GHG emission calculation details associated with the buildings and other facilities sector's natural gas usage and leakage are provided in Table 30.[21]

Table 30 Municipal Buildings and Facilities Sector Natural Gas GHG Emissions Calculations

GHG Emissions Source	Activity Data [therms]	Adjusted Activity Data [therms]	Emissions Factor [MT CO_2e/therm]	Emissions [MT CO_2e]	Scope
Natural Gas Consumption	3,272	3,256	0.005311	17	Scope 1
Natural Gas Methane Leaks[1]		92	0.053067	5	Scope 1
Total				**22**	**Scope 1**

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent

1. Emission factor is calculated using the following equation:

$$2.85\ \frac{cubic\ meters}{therm} * 95\%\ methane\ content * 0.7 \frac{kg}{cubic\ meter} * 28\ \frac{CO_2e}{CH_4} * 0.001 \frac{MT}{kg}$$

Electricity associated with streetlights, traffic signals, water delivery, irrigation, wastewater infrastructure, vehicle fleet EV charging, and powering buildings and facilities is provided to the City by SCE and is considered Scope 2 emissions. Electricity activity data provided by the City was applied to SCE's 2021 power label emissions factor as reported to the CEC to quantify GHG emissions.[22] Additionally, T&D electricity losses are included in the City's 2021 Municipal Inventory to align with sector inclusions of the City's 2021 GHG Community Inventory. The GHG emission calculation details associated with the City's municipal electricity usage are provided in Table 31.

Table 31 Municipal Electricity GHG Emission Calculations

GHG Emissions Source	Utility Provider	Activity Data [kWh]	Emissions Factor [MT CO_2e/kWh]	Emissions [MT CO_2e]	Scope
Electricity Consumption	SCE	2,172,389	0.000263	572	Scope 2
Electricity Consumption T&D[1]	SCE	95,585	0.000263	25	Scope 2
Total				**572**	**Scope 2**

Notes: kWh = kilowatt hour; MT CO_2e = Metric tons of carbon dioxide equivalent

1. Electricity consumption T&D includes the T&D associated with electric vehicle charging at City buildings and facilities.

4.2.2 Water Delivery Facilities

City produced water is considered a Scope 2 emissions source as the facility and distribution infrastructure are owned and operated by the City. The City's electricity consumption utility data report provided aggregated activity data which is assumed to include municipal building water consumption. Emissions associated with water delivery are assumed to be accounted for in the municipal electricity sector.

[21] In general, equations used in the municipal emissions inventory are the same as the community inventory and are therefore not included the following municipal inventory sections Please refer to the community emissions inventory sections above for the specific relevant equations.

[22] California Energy Commission (CEC). 2023. 2021 Power Content Label submitted by Southern California Edison. Available at: https://www.energy.ca.gov/filebrowser/download/4676

The GHG emission calculations details are provided in Table 32.

Table 32 Municipal Water Activity Data

Water Districts	Activity Data [AF]
Local Water Supply	
City of San Fernando	312.55

Notes: AF = acre-feet

The energy intensities and emissions factors per provider are summarized in Table 33.

Table 33 Municipal Water Energy Intensity, Emissions Factor, and Total Emissions Per Water Provider

Water District	Energy Intensity (kWh/AF)	Emissions Factor [MT CO_2e/kWh]	Emissions [MT CO_2e/year]
Local Water Supply			
City of San Fernando[1]	2,421.2[1]	0.000263[2]	199[3]

Notes: kWh = kilowatt hour; AF = acre-feet

1. Energy Intensity information for the City of San Fernando was sourced from the City's 2020 Urban Water Management Plan available at: https://ci.san-fernando.ca.us/wp-content/uploads/2021/06/San-Fernando_2020-UWMP_Public-Draft_2021-06-02.pdf

2. Emissions factors are sourced from the City's electricity provider (SCE) power label information available at: https://www.energy.ca.gov/filebrowser/download/4676

3. To limit double counting, emissions are not included in the 2021 Municipal Inventory.

4.2.3 Vehicle Fleet

Vehicle fleet emissions include Scope 1 sources that relate to the mobile combustion of fossil fuels in the City's fleet vehicles. Fleet vehicles include light and medium-duty vehicles and trucks, and off-road vehicles and equipment. The employee commute sector accounts for emissions generated by City employees' trips to and from work and is treated as separate from the use of personal vehicles for work and is discussed in the section below. The City tracks data for the vehicle fleet including diesel, gasoline, compressed natural gas (CNG), and propane fuel use which provided the activity data for this sector. Emission factors for diesel, gasoline, CNG, and propane were obtained from the EPA Emission Factors for Greenhouse Gas Inventories Report.[23] Electricity emissions associated with EV fleet vehicles are assumed to already be captures in municipal electricity usage.

The GHG emission calculation details associated with vehicle fleet sector sources are provided in Table 34.

[23] Environmental Protection Agency (EPA). 2022. GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

Table 34 Municipal Vehicle Fleet Sector GHG Emission Calculations

GHG Emission Source	Activity Data		Emissions Factor		Emissions [MT CO_2e]	Scope
On-road and Off-road vehicles						
Diesel	913	Gallons	0.01024	MT CO_2e/gal	9	Scope 1
Gasoline	31,001	Gallons	0.00881	MT CO_2e/gal	273	Scope 1
CNG	4,403	therms	0.00531	MT CO_2e/therm	23	Scope 1
Propane	15	Gallons	0.00574	MT CO_2e/gal	0.1	Scope 1
Total					**306**	**Scope 1**

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; gal = gallons; Values may not add due to rounding

4.2.4 Transit Fleet

Transit fleet emissions include Scope 3 sources that relate to the mobile combustion of fossil fuels from Mission City Transit Dial-A-Ride vehicles and the Los Angeles County Metropolitan Transportation Authority (Metro) buses. Activity data was obtained from the City's CNG station fuel report.[24] The quantification process to determine activity data and emissions factors for transit vehicles follows the same procedure used for the City's vehicle fleet. The GHG emission calculation details associated with transit fleet sector sources are provided in Table 35.

Table 35 Municipal Transit Fleet Sector GHG Emission Calculations

GHG Emission Source	Activity Data		Emissions Factor		Emissions [MT CO_2e]	Scope
CNG	44,914	therms	0.00531	MT CO_2e/therm	239	Scope 3
Total					**239**	**Scope 3**

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; gal = gallons; Values may not add due to rounding

4.2.5 Solid Waste Facilities

Solid waste generated at municipal buildings and facilities produces Scope 3 GHG emissions from process emission and the decomposition of waste at a landfill. The City's solid waste is collected by Republic Services. For consistency in GHG emissions accounting, municipal solid waste GHG emissions were quantified consistent with the methodology applied to the City's 2021 Community GHG Inventory. The GHG emissions calculations for municipal solid waste are summarized in Table 36.

Table 36 Municipal Solid Waste GHG Emission Calculations

Sector	Activity Data [wet short ton]	Emission Factor [MT CO_2e/wet short ton]	GHG Emissions [MT CO_2e]	Emission Source Scope
Landfill Decomposition	784.72	0.52	2,571	Scope 3
Landfill Process	784.72	0.0110	9	Scope 3
Total			**2,580**	**Scope 3**

[24] Data provided by City staff for the City's CNG station includes an unknown amount of fuel usage associated with vehicles outside of the transit fleet. Therefore, emissions for this source are likely overestimated in the 2021 Municipal Inventory.

4.2.6 Wastewater Facilities

Wastewater management produces emissions through every stage of the collection and treatment process and falls under Scope 3 emissions as the City's wastewater is treated by the LACSD whose Hyperion WRP facilities exist outside of the City and are not under the City's jurisdictional control. However, the wastewater collection and conveyance infrastructure are managed by the City, therefore, Scope 2 emissions from electricity used by wastewater collection infrastructure within the City are also included. Electricity consumption activity data for wastewater collection infrastructure was reported in the City's annual electricity consumption utility data summary report. Additionally, the inventory for wastewater facilities includes T&D losses associated with the City's wastewater collection infrastructure to maintain consistency with the community inventory and the buildings and emissions sectors.

Except for electricity use, activity data for emissions associated with wastewater treatment at Hyperion WRP are based on the number of full-time City employees as provided by the City. Activity data for wastewater treatment electricity use was determined using the same methodology applied in based on the number of City employees. Default emission factors applicable to the Hyperion WRP were applied to the activity data consistent with methods used in the City's 2021 Community GHG Inventory.[25] The total GHG emissions generated by the City produced wastewater treatment can be found in Table 37.

Table 37 Municipal Wastewater GHG Emissions

GHG Emission Source	Activity Data		Emissions Factor[1]		Emissions [MT CO_2e]	Scope
Wastewater Treatment						
Stationary Combustion	91	employees	0.0000626	MT CO_2e/employee	0.01	Scope 3
Effluent Discharge Fugitive N2O	91	employees	0.0008480	MT CO_2e/employee	0.08	Scope 3
Process N2O Emissions	91	employees	0.0097066	MT CO_2e/employee	0.88	Scope 3
Electricity Use	3,676	kWh	0.0002421	MT CO_2e/kWh	0.89	Scope 3
Electricity Use T&D	162	kWh	0.0002421	MT CO_2e/kWh	0.04	Scope 3
Total					**1.90**	**Scope 3**

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; kg = kilogram; kWh = kilowatt hour; Values may not add due to rounding

4.2.7 Employee Commute

Emissions from employee commute include Scope 3 GHG emissions sources from the mobile combustion of fossil fuels generated by the City's employee vehicles due to employees commuting to and from work.[26] The annual commute miles travelled per year were estimated based on full-time employee data provided by the City, the average commute miles per one way trip as reported

[25] See Community Protocol wastewater sector methods (Section **Error! Reference source not found.**) for all default inputs including emissions factors used to calculate wastewater emissions.

[26] GHG emissions associated with business travel was excluded from the 2021 Municipal Inventory as it is currently unavailable. LGOP states that business travel emissions may be excluded based on the City's discretion.

by a study published by SCAG,[27] and a 246 workday per year conversion factor[28]. The passenger vehicle emissions factor provided by EMFAC2021[29] was applied to activity data to determine GHG emissions from employee commute. The GHG emissions associated with the employee commute sector are provided in Table 38.

Table 38 Municipal Employee Commute GHG Emissions

GHG Emission Source	City Employees	Avg One-way Distance [mi/trip]	Workdays per Year	Activity Data [VMT]	Emissions Factor [MT CO_2e/mi]	Emissions [MT CO_2e]	Emission Source Scope
Employee Commute	91[1]	9.10	246.00	407,425.20	0.00035	144	Scope 3

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; mi = miles; Values may not add due to rounding

1. City employees total was averaged (and rounded up) based on the number employees from January, June, and December 2021, as provided by City staff via email.

4.3 2021Municipal GHG Emissions Inventory Results

The inventory provides the City with current GHG emissions estimates that follow the Local Government Operations Protocol and current best practices for GHG accounting. The results of the 2021 Municipal Inventory are shown in detail in Table 39. San Fernando's total municipal GHG emissions in 2021 is 3,888 MT CO2e. Solid waste (67 percent) and transportation (18 percent) accounted for the first and second largest amount of municipal GHG emissions in San Fernando in 2021. Infrastructure electricity accounts for 15 percent of total emissions while infrastructure natural gas and wastewater account for 0.5 percent and 0.03 percent, respectively.

[27] Southern California Association of Governments. 2021. Spatiotemporal Analysis of Jobs-Housing Fit in Southern California (ID: P21-20281). Available at: https://scag.ca.gov/sites/main/files/file-attachments/ej_jhfit_scag_2021trb.pdf?1612993870

[28] The number of workdays per year is estimated based on a 5-day work week for 52 weeks per year. Assuming a two-week vacation, this equates to 246 days per year.

[29] California Air and Resources Board. 2023. Emission FACtor (EMFAC2021 v1.0.1) Model. Available at: https://arb.ca.gov/emfac/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

Figure 2 Municipal Inventory GHG Emissions by Sector

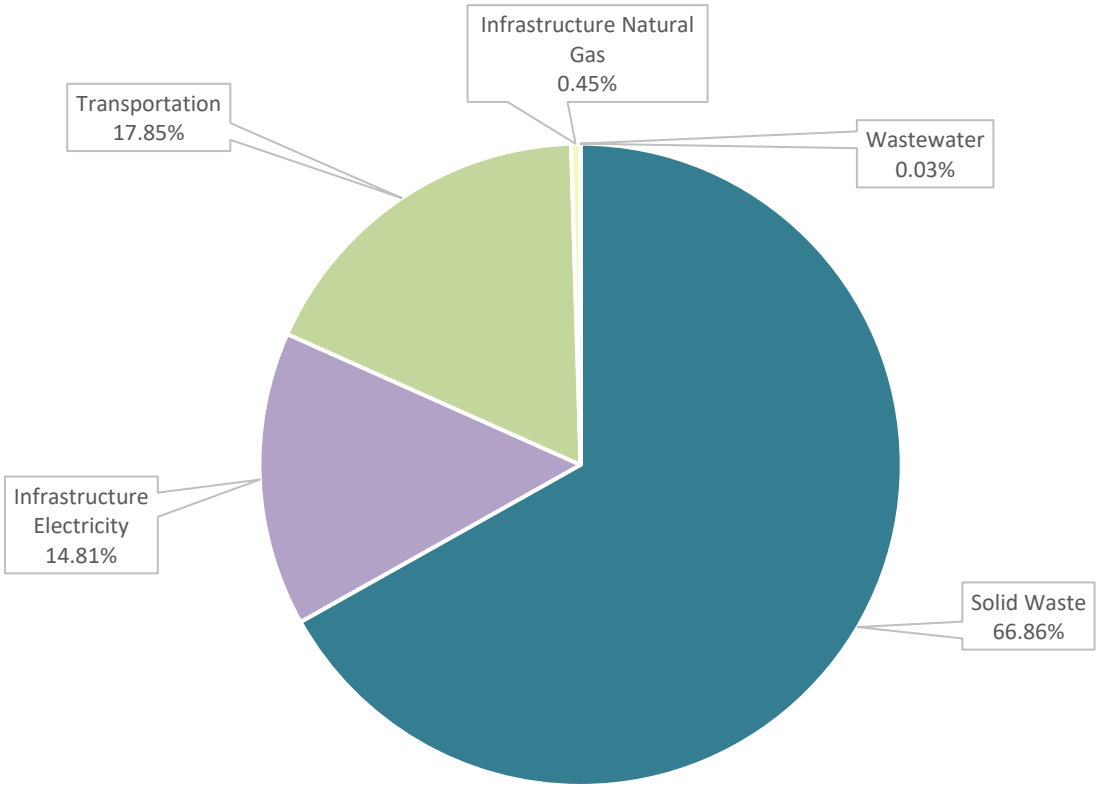

Table 39 Municipal GHG Emissions Inventory

GHG Emissions Sector	GHG Emissions Subsector	Activity Data		Emission Factor		GHG Emissions (MT CO_2e)
Buildings and Other Facilities	Municipal Electricity	2,172,389	kWh	0.000263	MT CO_2e/kWh	572
	Municipal Electricity T&D	95,585	kWh	0.000263	MT CO_2e/kWh	25
	Municipal Natural Gas	3,256	therms	0.00531	MT CO_2e/therm	17
	Municipal Natural Gas Leaks	92	therms	0.0530	MT CO_2e/therm	5
Water	Local	-	kWh	-	MT CO_2e /kWh	-
Vehicle Fleet	Vehicle Fleet - Diesel	913	Gallons	0.010243	MT CO_2e /Gallon	9
	Vehicle Fleet - Gasoline	31,001	Gallons	0.008812	MT CO_2e /Gallon	273
	Vehicle Fleet - CNG	4,403	therms	0.005311	MT CO_2e /therm	23
	Vehicle Fleet - Propane	15	Gallons	0.005741	MT CO_2e /Gallon	0.1
Transit Fleet	Transit Fleet - CNG	44,914	therms	0.005311	MT CO_2e /therm	239
Solid Waste	Landfill Methane	785	tons	0.520000	MT CO_2e /ton	2,571
	Process Emissions	785	tons	0.011000	MT CO_2e /ton	9
Wastewater	Stationary Combustion	91	persons	0.000063	MT CO_2e /person	0.01
	Process N_2O Emissions	91	persons	0.000848	MT CO_2e /person	0.08
	Effluent Discharge Fugitive N_2O	91	persons	0.009707	MT CO_2e /person	0.88
	Electricity Use	3,676	kWh	0.000242	MT CO_2e /kWh	0.89
	Electricity Use T&D	162	kWh	0.000242	MT CO_2e /kWh	0.04
Employee Commute	Municipal Employee Commute	407,425	VMT	0.000354	MT CO_2e/mile	144
Total						**3,888**

Notes: VMT = vehicle miles traveled; kWh = kilowatt hour; MT CO_2e = Metric tons of carbon dioxide equivalent; gal = gallons

Appendix E

Funding and Financing

Climate Action & Resilience Finance Map

Pathways to Capital for The City of San Fernando's 2026 Climate Action & Resilience Plan

January 2026

City Climate Action Strategies	Capital Types	Top Funding and Finance Pathways	Programs and Partners	Case Examples
CORNERSTONE **Measure CS-1** Create Resilience Hubs CS-1 Expand and strengthen neighborhood resilience by supporting the development of year-round community resilience hubs within trusted local facilities. These hubs would provide residents with accessible resources to address the City's most pressing climate hazards.	**GRANT**	State Grants via Govs Office / ICARP ***	Regional Resilience Planning & Implementation Grant Program	2023 ICARP Grantees
	GRANT	State Grant via Ca Strategic Growth Council	Community Resilience Centers Grant Program	2024 CRC Planning Grantees
	GRANT	Federal Grants via FEMA	FEMA Hazard Mitigation Program (BRIC Program)	Sacramento, CA
	GRANT	Federal Grants via Department of Energy	Grid Resilience & Innovation Partnerships (GRIP)	TERAS Humboldt Portland Gen. Electric
	GRANT	Federal Grant via USDA	USDA Urban Agriculture Grants	Twin Cities, MN
	GRANT	Federal Grant via the American Rescue Plan	Schools as Cooling Centers Program	Multnomah Co, OR, and Kittitas Co, WA
	GRANT	Foundation Grants *for all aspects of Resilience Hubs*	Hilton Foundation ; California Resilience Partnership	San Diego, CA
	PARTNER	Utility-Led Incentives *	Southern California Edison	PG&E Resiliency Hubs SBUSD Microgrid
	PARTNER	Public Private Partnership	Vaughn Next Century Learning Center	White Earth Nation Reservation, MI
	PARTNER	Nonprofits, Educational Institutions, and/or Foundations	Pacoima Beautiful Climate Resolve	Pacoima , CA
	LOAN	Private Investment Loan *for microgrid and efficiency costs*	Generate Capital	Green Mountain, NC
	LOAN	Green Bank	Coalition For Green Capital	Takoma Park, MD
	BOND	General Obligation Bond	California IBank	Bastrop, TX

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Pathways highlighted in darker gray are particularly applicable and/or accessible to the San Fernando Community

** Indicates a pathway may Involve Residential & Commercial Costs*

*** Pathway cancelation currently under dispute*

Climate Action & Resilience Finance Map

Pathways to Capital for The City of San Fernando's 2026 Climate Action & Resilience Plan

January 2026

BUILDING AND UTILITIES SYSTEM

Measure BU-1
Carbon-free Electricity and Storage

BU-1 Support communitywide transition to carbon-free electricity by partnering with Southern California Edison and regional agencies to expand rooftop solar, battery storage, and neighborhood-scale microgrids. Improve electrical system resilience with targeted upgrades such as backup power for schools and resilience hubs, and promote demand-response programs that help residents and businesses reduce peak-time energy use and lower monthly bills.

Capital Types	Top Funding and Finance Pathways	Programs and Partners	Case Examples
GRANT	State Grants via CA Energy Commission	CERRI	Anaheim PUB
GRANT	State Grants via CA Public Utilities Commission	EPIC Grant	Fremont, CA
GRANT	Federal Grant via Department of Energy	Grid Resilience & Innovation Partnerships (GRIP)	Entergy New Orleans
GRANT	Fed/ State Grants via Solar For All **	California iBank GRID Alternatives	Energy For All
PARTNER	DOE Technical Assistance	Office of Indian Energy Technical Assistance	San Pasqual Mission Indians Microgrid
PARTNER	Power Purchasing Agreement	ENGIE, Ameresco	Glendale / SCPPA San Jose, CA
PARTNER	Collaborative Community Ownership	Clean Coalition	Boardman Hill, VT
PARTNER	Utility-Led Incentives *	Southern California Edison	Green Mtn Power, VT
PARTNER	State Incentive Program (CA-PUC)*	GRID Alternatives DAC-SASH / Self-Generation Incentive (SGIP)	PG&E Projects / San Pasqual Mission Indians
LOAN	Tax-Exempt Lease Purchase Agreement	GS $mart	Bloomington, IN , and Efficiency Maine
LOAN	On-Bill Financing	Southern California Edison	EESI Case Studies Grand Valley, CO
LOAN	Green Bank or Revolving Loan Fund	Coalition For Green Capital	San Antonio, TX
LOAN	State Revolving Loan Fund	Infra. State Revolving Fund (ISRF) Program	Orange County Library
LOAN	PACE or C-PACE Financing *	CaliforniaFirst / Renew Financial	Sunnyvalley Smoked Meats Manteca, CA
LOAN	Private Investment Firm Loan	Generate Capital	Goldenrod Community Solar
BOND	General Obligation Bond (Green)	California iBank	Lakeport, CA
FEE	Developer Impact Fee *	LA County Planning	Hawaii Microgrid Tariff
TAX	Enhanced Infrastructure Financing District *	Southern California Association of Governments (SCAG)	SCAG Climate Safe Infrastructure

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Climate Action & Resilience Finance Map

Pathways to Capital for The City of San Fernando's 2026 Climate Action & Resilience Plan

January 2026

City Climate Action Strategy	Capital Types	Top Funding and Finance Pathways	Programs and Partners	Case Examples
BUILDING AND ENERGY SYSTEMS **Measures BU-3** Promote Existing Building Retrofitting and Resilience BU-3 Connect building owners and renters with incentives, rebate, and education programs to upgrade existing homes and businesses, enabling them to become zero-carbon and resilient to extreme heat, flooding, and poor air quality.	**GRANT**	State Grant via CA Energy Commission	BUILD, CalEHP	CalEHP Impact Map
	GRANT	State Grant via CA Strategic Growth Council	Transformative Climate Communities (TCC)	West Fresno
	GRANT	Fed/ State Grants via Solar For All **	California iBank Grid Alternatives	Energy For All
	GRANT	State Grant via CAL FIRE	Tribal Wildfire Resilience Grants	Koy'o Land Conservancy
	PARTNER	State Incentives via CAL Fire*	CA Wildfire Mitigation Program - Home Hardening	San Diego County
	PARTNER	Weatherization Assistance Programs (WAP) + Incentives *	Maravilla Foundation Inc, CA Weatherization AP	Madera County, CA
	PARTNER	State Solar Incentives for Disadvantaged Communities	Grid Alternatives DAC-SASH	DAC-SASH Project Examples
	PARTNER	Statewide Incentives Program	TECH Clean California	Redwood Coast Energy Authority
	PARTNER	Energy Savings Performance Contracts	Willdan / Lime Energy	Westin Rancho Mirage
	PARTNER	Utility-Led Incentives *	Southern California Edison	BayREN Lincoln Ave
	PARTNER	Private Financing + Project Management	BlocPower	Oakland MultiFamily
	LOAN	On-Bill Financing (Tariff) *	Southern California Edison	Clayburn Appts., San Jose, CA
	LOAN	PACE or C-PACE Financing *	CaliforniaFirst / Renew Financial	Sunnyvalley Smoked Meats Manteca, CA
	LOAN	Green Bank or Revolving Loan Fund *	Coalition For Green Capital	CT Green Bank
	LOAN	Federal or State Loan Program *	GoGreen Financing	Meadowcrest Energy Upgrade
	LOAN	Federal Loan Program *	Energy Efficiency and Conservation Loan Program	REAP Recipients
	LOAN	HomeStyle Energy Mortgage *	Fannie Mae, New American Funding	Milwaukee, OR

Climate Action & Resilience Finance Map

Pathways to Capital for The City of San Fernando's 2026 Climate Action & Resilience Plan

January 2026

City Climate Action Strategies	Capital Types	Top Funding and Finance Pathways	Programs and Partners	Case Examples
BUILDING AND UTILITY SYSTEM **Measures BU-4** Municipal Climate Action Leadership	GRANT	State Grants via CA Public Utilities Commission	EPIC Grant	Fremont, CA
	GRANT	State Grants via CA Energy Commission	Local Government Challenge Grant	Santa Cruz, CA
	PARTNER	Energy Savings Performance Contracts	Opterra, Ameresco Southern California Edison	Fort Worth TX Partner-Ally Network
	PARTNER	Power Purchasing Agreement	ENGIE, Ameresco	Glendale / SCPPA San Jose, CA
	PARTNER	Utility-Led Incentives	Southern California Edison	Rancho Mirage, CA
	PARTNER	Collaborative Purchasing	Sourcewell	Chico, CA
	LOAN	Low Interest State Loan Program	Energy Conservation Assistance Act	Middletown Rancheria
	LOAN	Tax-Exempt Lease Purchase Agreement	GS Golden State $mart	Bloomington, IN , and Efficiency Maine
	LOAN	On-Bill Financing	Southern California Edison	Seattle, WA
	LOAN	Green Bank	Coalition For Green Capital	San Antonio, TX
	LOAN	State Revolving Loan Fund	Infra. State Revolving Fund (ISRF) Program	IBank Loans, CA Twentynine Palms, CA
	LOAN	Investment Firm (e.g. Private Credit)	Generate Capital	Hillsborough, FL
	BOND	General Obligation Bond (Green)	California IBank	Lakeport, CA

BU-4 Decarbonize City-owned buildings through energy efficiency upgrades, renewable energy integration, and electrification of key systems. Partner with local trade schools and workforce programs to train and employ residents in implementing these projects, creating green jobs and building community capacity while demonstrating City leadership in sustainability and resilience.

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Climate Action & Resilience Finance Map

Pathways to Capital for The City of San Fernando's 2026 Climate Action & Resilience Plan

January 2026

MOBILITY & LAND USE SYSTEM

Measures MLU-2

Improve Trolley Service

MLU-2 Expand and optimize the San Fernando trolley network to improve route coverage, accessibility, safety, and connections to key destinations such as downtown, schools, parks, and transit hubs, while integrating community feedback on service frequency, financial feasibility, and minimal disruption to street infrastructure.

City Climate Action Strategies	Capital Type	Top Funding and Finance Pathways	Programs and Partners	Case Examples
	GRANT	State Grants via Caltrans	CalTrans Transit Intercity Rail Capital Program TIRCP	San Diego Trolley Improvements
	GRANT	State Vouchers via CA Climate Investments	Clean Mobility Options Voucher Pilot Program (CMO)	SANDAG
	GRANT	Federal Grants via FTA	Buses & Bus Facilities Grants Program	Bus & Low- or No-Emission Awards
	GRANT	Federal Grants via FTA	Capital Investment Grants Program	Capital Investment Grants Projects
	GRANT	Federal Grants for Technical Assistance for PPPs via DOT Build America Bureau	Innovative Finance and Asset Concession Grant Program	2022-2024 Awardees
	PARTNER	Trip Reduction and Transportation Demand Assistance	Employee Commute Reduction Program	South Coast Air Quality District
	PARTNER	PPP with Digital Advertising	San Fernando Chamber of Commerce San Fernando Valley Historical Soc.	LA Bus Shelters
	PARTNER	PPP with Local Employers	San Fernando Chamber of Commerce San Fernando Valley Historical Soc.	Minneapolis-St. Paul Bus Rapid Transit
	PARTNER	PPP with 'Fleet-as-a-Service'	PhoenixEV / Proterra	Santa Rosa, CA Valley Regional
	LOAN	Federal or State Loan Programs	TIFIA Loan	Mid-Coast Trolley
	BOND	Green Bond or Revenue Bond	CA Alternative Energy & Adv Transp Fin Auth (CAEATFA)	Kansas City Streetcar
	FEE	Transportation Fee *	San Fernando Public Works	Chicago, IL
	TAX	Enhanced Infrastructure Financing District *	SCAG (EIFD), CALED	Los Angeles County, CA

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Climate Action & Resilience Finance Map

Pathways to Capital for The City of San Fernando's 2026 Climate Action & Resilience Plan

January 2026

MOBILITY & LAND USE SYSTEM

Measures MLU-3

Active Transportation Infrastructure

MLU-3 Increase walking, biking, and other active transportation in San Fernando by upgrading sidewalks, crosswalks, bike lanes, and pedestrian paths to improve safety, accessibility, and connectivity. Prioritize shaded routes, stormwater capture, lighting, ADA-compliant infrastructure, and secure bike parking to confirm all residents have equitable access to convenient and safe active transportation options.

Capital Type	Top Funding and Finance Pathways	Programs and Partners	Case Examples
GRANT	State Grant via Caltrans	Active Transportation Program	Santa Barbara, CA
GRANT	State Grant via California Natural Resources Agency	Urban Greening Program Envir Enhance. & Mitigation	2023 Urban Greening Awardees
GRANT	State Grant via CA Strategic Growth Council	Transformative Climate Communities (TCC)	San Fernando Valley
GRANT	State Vouchers via CA Climate Investments	Clean Mobility Options Pilot Program (CMO)	San Jose, CA
GRANT	Fed Grant via Department of Transportation	Reconnecting Communities Pilot Grant Program	Philadelphia, PA
GRANT	Fed Grant via Department of Transportation	Active Transportation Infrastructure Inv. Program	Yolo County, CA
GRANT	Foundation Grants	People for Bikes, Outride	Summer 2024 Awardees
PARTNER	Public-Private Partnership - Foundation + Fees	San Fernando Chamber of Commerce, Metro Bike Share	Chattanooga, TN Indianapolis Cultural
LOAN	State Government Loan Program	Infra. State Revolving Fund (ISRF) Program	Santa Cruz, CA
LOAN	Federal Government Loan Program	Transport Infrastructure and Innovation Act (TIFIA)	State of Maryland
BOND	General Obligation Bond	CA Alternative Energy & Adv Transp Fin Auth (CAEATFA)	San Diego County, CA
FEE	Developer Impact Fee *	LA County Planning	Santa Monica, CA and Watsonville, CA
TAX	Enhanced Infrastructure Financing District *	EIFD via SCAG	Santa Rosa, CA

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*** Pathway cancelation currently under dispute*

Climate Action & Resilience Finance Map

Pathways to Capital for The City of San Fernando's 2026 Climate Action & Resilience Plan

January 2026

City Climate Action Strategy	Capital Types	Top Funding and Finance Pathways	Programs and Partners	Case Examples
MOBILITY AND LAND USE SYSTEM **Measure MLU-4** Increase Electric Vehicle Charging Infrastructure MLS-3 Prepare the City for widespread zero-emission vehicle adoption by investing in universal EV charging stations (public and commercial), offering community EV education and ride-and-drive events, and promoting safe passenger and commercial EV use as vehicle costs decline.	**GRANT**	State Grants via CARB	Driving Clean Assistance Program (DCAP)	2024 Outcomes
	GRANT	State Grant via CA Energy Commission	Communities In Charge	Awards Dashboard
	GRANT	State Grant via CA Energy Commission	Clean Mobility Options Pilot Program (CMO)	San Jose, CA
	GRANT	Federal / State Grants via CEC and Caltrans	National EV Infrastructure Formula Program	Boulder County, CO
	GRANT	Government Grants *see this federal incentives list*	CEC CTP, Federal Transit Administration	California EV Infrastructure
	PARTNER	Tribal Nations Technical Assistance	Technical Assistance for Tribal Nations	San Pasqual Mission Indians Microgrid
	PARTNER	Federal Incentives	EV Charging Property Tax Credit (30C)	Stanford Analysis
	PARTNER	Utility Incentives, Pricing Plans, & Rebates *	Southern California Edison	Avista Corp - PNW C40 Examples
	PARTNER	PPP with Operations and Maintenance *	Carbon Solutions Group Blink, ChargePoint	Porterville, CA
	PARTNER	State Infrastructure Incentive Program *	CALeVIP, Communities In Charge	Current Projects
	LOAN	State Loan (with Loan Loss Reserve) *	CalCAP (current lender list)	Los Angeles + Noodoe EV
	FEE	Variable Pricing Model, Idling Fee	Carbon Solutions Group NovaCHARGE	Chapel Hill, NC

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URBAN ECO-SYSTEMS

Measures UE-1
Water System Infrastructure Resilience

UE-1 Enhance the resilience of San Fernando's water systems by integrating stormwater management, potable water conservation, and equitable access to sustainable water resources, confirming all residents have reliable access to clean, safe, and affordable water as a basic human right.

City Climate Action Strategies	Capital Types	Top Funding and Finance Pathways	Programs and Partners	Case Examples
	GRANT	State Grant via Clean Water State Revolving Fund	State Water Resources Control Board	West County Wastewater District, CA
	GRANT	State Grant via Proposition 68	State Water Resources Control Board	San Gabriel Basin Water Quality Authority
	GRANT	State Grant via Proposition 4	State Water Resources Control Board	Los Angeles DWP
	GRANT	State Grant via Proposition 1	State Water Resources Control Board	Orange County, CA
	GRANT	State Grant via Stormwater Grant Program	State Water Resources Control Board	South Gate, California
	GRANT	Federal Grant via IRA Section 50231 – Water Access Grants	US Department of Interior	Colorado River Basin
	GRANT	Federal Grant via Safe Drinking Water Act and the Drinking Water State Revolving Fund	Drinking Water Infrastructure Grants - Tribal Set-Aside Program	Muscogee Creek Nation, OK
	GRANT	Federal Grant via EPA	Nonpoint Source Program	Dry Creek Rancheria Band of Pomo Indians
	PARTNER	Private Public Partnership	Corvias	Prince George's County, MD
	PARTNER	Community Based Partnership	Engineers Without Borders / Green Print Partners	Houma Tribe / Milwaukee Sewer District
	LOAN	Federal Loan via Environmental Protection Agency (EPA)	Clean Water State Revolving Fund	Yurok Tribe, CA
	LOAN	Federal-State Loan via CWSRF	California Stormwater Quality Association	El Cerrito, California
	BOND	Environmental Impact Bond (defined here)	Quantified Ventures	DC Water
	FEE	Developer Impact Fee *	LA County Planning	Brea, CA Developer Impact Fee Study
	Tax	Tax increment financing	Southern California Association of Governments (SCAG)	Redondo Beach, CA San Diego River District
	Incentive	Stormwater Credits	City of San Fernando Water Division	Springfield, OH

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City Climate Action Strategies	Capital Types	Top Funding and Finance Pathways	Programs and Partners	Case Examples
URBAN ECO-SYSTEM **Measures UE-2** Implement An Urban Forestry Management Plan UE-2 Increase citywide tree canopy and community-centered green spaces to reduce the urban heat island effect by supporting and implementing the strategies outlined in the Urban Forest Management Plan.	**GRANT**	State Grant via California Natural Resources Agency	Urban Greening Program Env. Enhance. & Mitigation	2024 Urban Greening Awardees
	GRANT	State Grant via CAL FIRE, Department of Forestry and Fire Protection	Urban and Com Forestry Pgm; Forest Improvements Program	2024 Awardees
	GRANT	State Grant via CA Strategic Growth Council	Transformative Climate Communities (TCC)	San Fernando Valley
	GRANT	Federal Grant via The Forest Service	Urban & Community Forestry Program (UCF)	2024 American Forest Awardees
	GRANT	Federal Grant via The Forest Service	Urban & Com Forest Program Community Wildfire Defense	Lake County, CA
	PARTNER	Federal Assistance via National Park Service	River, Trails, and Conservation Assistance Program	Los Angeles River
	PARTNER	Community Based Partnership	California ReLeaf	Multiple CA cities and communities
	PARTNER	Community Benefits Agreement	Community Develop. Dept.	Richmond, CA
	LOAN	State Loan via California IBank	Infra. State Revolving Fund (ISRF) Program / CLEEN Loans	City of San Gabriel, CA
	LOAN	Federal Loan via Environmental Protection Agency (EPA)	Clean Water State Revolving Fund	El Cerrito, CA
	BOND	Environmental Impact Bond (defined here)	Quantified Ventures	S.W. Colorado
	FEE	Developer Impact Fee or Stormwater Utility Fee *	TreePAC	Cupertino Clean Water & Storm Protection Fee
	TAX	Enhanced Infrastructure Financing District *	Southern California Association of Governments (SCAG)	Redondo Beach, CA

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